Journal of Management Science Research Review
https://jmsrr.com/index.php/Journal/about
Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

THE IMPACT OF NON ECO-FRIENDLY PACKAGING ON GREEN BRAND EQUITY: THE MEDIATING ROLE OF GREENWASHING & ECO-LABEL CONFUSION & THE MODERATING ROLE OF BRAND TRUST & GREEN BRAND

Shaikh Muhammad Fakhre Alam
Assistant Professor, Karachi University Business School, University Of Karachi, Pakistan
Hammad Zafar
Lecturer, Karachi University Business School, University Of Karachi, Pakistan
Muhammad Konain Butt
Student, Karachi University Business School, University of Karachi, Pakistan

Abstract

The research aims to determine the antecedents of green brand equity in Pakistan's FMCG market through green branding, eco-label credibility, perceived greenwashing, and their interactive effects. The need for environmental friendliness is proposed as a moderator on the effects of green branding and brand trust toward green brand equity while examining the mediating roles of eco-label credibility and perceived greenwashing in the relationship between environmental friendliness and green brand equity. This positivist quantitative research employs a cross-sectional survey method. Primary data were collected from 409 respondents among FMCG consumers in Pakistan using a structured questionnaire comprising closed-ended questions based on five-point Likert scales ranging from strongly disagree to strongly agree with statements related to different constructs under study. Data analysis involved the PLS-SEM (SmartPLS) application for assessing both measurement model validity/reliability aspects, together with testing direct/moderating/mediating paths' significance levels within the proposed conceptual framework model structure. The results show that the need for environmental friendliness significantly increases both perceptions towards eco-label credibility as well as perceivedgreenwashing. The moderating effects of environmental friendliness on the relationship between brand trust and green brand equity, and green branding and green brand equity, are not supported. The study also finds no support for the indirect effects of environmental friendliness on green brand equity through eco-label credibility and perceived greenwashing. Therefore, Pakistani FMCG firms should focus on a consistent evidence-based green branding rather than only labels. Environmentally oriented consumers seem to be more vigilant and at the same time more skeptical; hence, firms should enhance the credibility of green claims through transparent, verifiable communication to avoid skepticism without assuming that consumers will automatically reward labels or punish perceived greenwashing. This paper adds to existing works on green branding

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

by showing that in Pakistan's FMCG sector, green brand equity is mainly driven by green branding itself and not so much by eco-label credibility or consumers' perception of greenwashing. The findings exhibit the "aware-but-constrained" consumer pattern typical for emerging markets and provide context-specific evidence on why certain green cues do not convert into brand equity.

Keywords: Green branding; Green brand equity; Eco-label credibility; Greenwashing; Environmental friendliness

Introduction

The growing expansion of global consumer markets has intensified environmental concerns, particularly in relation to product packaging, which has emerged as a critical sustainability challenge due to its mass production, brief usage cycle, and rapid disposal. Evidence suggests that the lifecycle of packaging materials, especially plastics, remains largely linear rather than circular, as production and waste generation continue to rise while recycling rates remain insufficient (OECD, 2022). Within fast-moving consumer goods (FMCG) sectors, packaging contributes significantly to overall plastic waste, reinforcing its role as a major environmental burden (Our World in Data, 2024; OECD, 2022). This issue is further compounded by the increasing volume of global waste, which not only generates environmental degradation but also imposes economic costs, thereby pushing sustainability agendas toward circular and zero-waste approaches. Additionally, plastic leakage into ecosystems continues to pose serious threats to biodiversity and human wellbeing, with millions of tonnes entering natural environments annually (UNEP, 2025). Consequently, regulatory frameworks are becoming stricter, as seen in policy developments such as enhanced packaging waste regulations in the European Union, signaling that packaging is no longer a peripheral concern but a central sustainability issue (Reuters, 2024).

Simultaneously, sustainability has become a dominant theme in modern branding strategies, prompting firms to communicate their environmental responsibility through product design, packaging, eco-labels, and marketing claims (Islam et al., 2025). However, this increasing emphasis on green positioning has also led to the widespread phenomenon of greenwashing, where firms exaggerate or misrepresent their environmental efforts (Badhan et al., 2023). This has created a credibility crisis, as consumers struggle to differentiate between authentic and misleading green claims (Twaha, 2024). Empirical evidence indicates that perceived inconsistencies between a brand's claims and its actual practices can lead to negative consumer reactions such as brand avoidance and adverse word-of-mouth, ultimately damaging brand reputation (Akter et al., 2025; Sajid et al., 2024). Moreover, consumers often misinterpret green signals in real purchase situations, as they may classify products as environmentally friendly without

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

critical evaluation, unless specifically prompted to assess greenwashing (Rasul et al., 2025; Fella & Bausa, 2024). This highlights a broader issue in sustainability communication, where the effectiveness of green signals depends on their clarity, credibility, and ease of verification (Islam et al., 2026; Choubey et al., 2025). When these signals are perceived as ambiguous or inconsistent, they can reduce consumer trust and weaken brand evaluations (Nahid et al., 2025; Zorgati et al., 2024).

Within this context, packaging plays a dual role as both a functional component and a powerful communication signal (Rahman et al., 2023). It is one of the most visible elements encountered by consumers at the point of purchase and thus significantly influences their perception of a brand's environmental commitment. Firms increasingly rely on packaging to signal sustainability, as it directly reflects product design and material usage (Herbes et al., 2024). However, excessive or non-eco-friendly packaging can create a contradiction between a brand's green claims and its observable practices. This contradiction may trigger perceptions of greenwashing and lead to confusion among consumers regarding the authenticity of sustainability claims (Amin et al., 2024). Prior research suggests that excessive product packaging (EPP) negatively impacts green brand equity by fostering both greenwashing perceptions and consumer confusion, while brand credibility may mitigate these adverse effects (Rahman et al., 2026; Qayyum et al., 2023). In this sense, packaging becomes more than a physical attribute; it acts as a symbolic representation of brand sincerity and environmental responsibility.
Green brand equity (GBE), which reflects the value a brand derives from its environmentally responsible image, is highly dependent on consumer perceptions and trust (Dash et al., 2025). When consumers perceive greenwashing, they may interpret sustainability claims as manipulative rather than genuine, thereby weakening the brand's credibility and reducing its equity (Tu et al., 2024). Furthermore, green confusion, defined as the difficulty consumers face in understanding and evaluating environmental information, can dilute brand associations and hinder the development of strong, favorable perceptions (Trinh et al., 2025). These psychological mechanisms highlight the importance of clear, consistent, and credible sustainability communication in building long-term brand value.

The relevance of these issues is particularly pronounced in emerging markets such as Pakistan, where environmental challenges related to packaging waste are significant, and regulatory enforcement remains relatively weak (Butt et al., 2025). National reports indicate substantial plastic waste generation and highlight deficiencies in waste management systems, contributing to environmental degradation (Pakistan EPA, 2024; UNCTAD, 2025). Additionally, visible environmental problems, such as littered packaging and polluted waterways, may intensify consumer skepticism toward

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

green marketing claims (WWF-Pakistan, 2025). In such a context, consumers are exposed to a high volume of sustainability messages but lack reliable mechanisms to verify their authenticity, increasing the likelihood of confusion and mistrust (Hasan et al., 2026).

Despite the growing body of research on green marketing and consumer behavior in Pakistan, most studies have focused on purchase intentions rather than examining green brand equity as a strategic outcome. Furthermore, limited empirical attention has been given to the role of excessive packaging in shaping greenwashing perceptions and green confusion, and how these factors collectively influence brand equity in the FMCG sector (Ahmed et al., 2024). This gap presents both a theoretical and practical challenge, as firms may invest heavily in green branding without addressing the negative signals conveyed through their packaging practices (Hasan et al., 2025).

Therefore, this study addresses a critical gap by examining how non-eco-friendly packaging influences green brand equity through the mediating roles of greenwashing and eco-label confusion, while also considering the moderating role of brand trust and credibility. By integrating these elements, the study provides a comprehensive framework to understand how visible operational practices, such as packaging, interact with consumer cognition to shape long-term brand outcomes. This approach not only contributes to the academic literature on green branding but also offers practical insights for firms operating in sustainability-sensitive markets, where credibility and transparency are essential for maintaining competitive advantage.

1.1. Research Problem Statement

Sustainability has gone mainstream as a branding strategy across global consumer markets. Green claims face increasing skepticism because greenwashing has grown in the shadow of ESG and net zero disclosure. Recent academic work confirms that greenwashing is not some fringe phenomenon; it describes greenwashing as widespread and persistent in contemporary markets, creating a trust and accountability problem for brands and all their stakeholders. (Montgomery et al., 2024) Empirically, environmental promise detection-when customers detect a mismatch between promises made and actual practices-they return strong negative outcomes such as brand avoidance and negative word of mouth which eventually eats into the brand value(Sajid et al., 2024) Most often consumers misclassify whether honest or dishonest ‘green cues’/sustainability signals hence intensifying confusion while weakening brand evaluation (Majumder et al., 2026; Fella et al., 2024) Packaging is one of the most visible and heavily criticized "green cues". New evidence from a branding study supports the notion that apparent over-packaging in the marketplace provides a signal to fuel perceptions of greenwashing, and confusion about all things green, which ultimately saps

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

green brand equity. However, it also shows that strong brand credibility can dampen (buffer) these negative effects (Paramitha et al., 2025). This finding sits comfortably within earlier work on branding, which showed paths from consumer confusion and skepticism to low green brand equity via links between excessive packaging, misleading green communication, and miscommunication.

This issue becomes more pressing in Pakistan, where packaging waste is a fast-emerging environmental and business menace, parallel to consumer markets, especially urban retail, becoming more susceptible to green marketing claims. There is national-level evidence on an increasing plastics and packaging footprint, besides systemic constraints of plastic waste management and regulation of practices across the value chain (UNCTAD 2024; WWF 2025).In such a setting, which relies heavily on high visibility packaging as well as point-of-sale environmental messaging, the packaged foods, beverages, and personal care FMCG sector provides perhaps the most relevant context since this is among those sectors where apparent over-packaging could be interpreted by "green" positioning rivals as contradictory. Green branding and green packaging cues determine consumer responses in Pakistan's local markets, as found by Ahmed et al. (2024) while discussing the outcomes of green brand equity for Pakistani industries such as banking, where a composite green brand image/perception leads to the formation of brand equity. Perceived greenwashing significantly drives Pakistani consumers' decision processes, which is an emerging finding at home (Nasir et al., 2026; Bibi, 2025). However, model-based evidence is scant in Pakistan on how excessive packaging transpires into low levels of green brand equity via avenues like greenwashing or even simply through creating confusion about what constitutes 'green', and when strong brands can still be protected from this harm, most particularly among FMCGs, where packaging forms an integral part of product experience. This is the specific research problem, and therefore, the manifestation of green brand equity in Pakistan's FMCG sector is threatened by excessive packaging that triggers perceptions of greenwashing, consumer confusion, and a boundary condition (brand credibility), which may potentially mitigate this erosion, but remains under-tested in the local context.

1.2. Research Gap Analysis

Previous studies find that green packaging cues significantly associate with green brand results, while more recent specific statements argue in detail that excessive product packaging (EPP) turns into a highly visible marketplace cue that develops the perception of greenwashing and consequently weakens Green Brand Equity through Green Confusion(Qayyum et al., 2023). This study investigates GBE drivers- EPP together with greenwashing and green confusion, as well as testing the boundary conditions of brand credibility's

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

potential to mitigate one or more proposed links. Other very recent international literature explains theoretically high potential mediators; this paper tests empirically because:" Consumers cannot always accurately classify whether apparent 'green' cues are actually genuine or simply being 'greenwashed'. This difficulty in categorization increases skepticism/misinterpretation, a state naturally producing confusion/degrading downstream(brands) evaluation. Recent and emerging literature strongly agrees with the fact that consumers mostly associate green packaging or labels as a primary cue towards any green product for their evaluation, hence precipitating such massive trends of "green" packaging/labeling strategies in contemporary markets (Quoc, 2025). On parallel lines, recent GBE-greenwashing studies conceptualize even more mediating paths—such as image, trust, satisfaction—in establishing that cognitive/attitudinal consumer mechanisms very often transmit an effect from greenwashing to brand equity apart from direct effects(Thao et al., 2025). What has been less tested though is a Pakistan FMCG-oriented study on the integrated path from packaging to equity erosion: Pakistani studies apparently focus on investigating purchase intentions with respect to green branding/packaging instead of positioning GBE as the central outcome(Ahmed et al., 2024), and when they do consider GBE it is either another sector (e.g. banking) using different mediators (e.g. green satisfaction) rather than via the packaging-driven greenwashing → green confusion pathway(Khanetal.,2023). However, in the FMCG context of Pakistan, packaging salience and sustainability messaging are clearly foregrounded (Rafiq et al., 2023). Yet empirical studies rarely model greenwashing and green confusion as mediators linking excessive packaging to green brand equity. Nor do they test, with any robustness, credibility as the condition that can buffer (weaken) the harmful mediated effects, a clear, concrete gap that your model directly addresses.

1.3. Research Objectives

1. To examine the impact of Excessive Product Packaging on Greenwashing.
2. To examine the impact of Excessive Product Packaging on Green Confusion.
3. To evaluate the impact of Greenwashing on Green Brand Equity.
4. To evaluate the impact of Green Confusion on Green Brand Equity.
5. To assess the moderating role of Brand Credibility in the relationship between Greenwashing and Green Brand Equity.
6. To assess the moderating role of Brand Credibility in the relationship between Green Confusion and Green Brand Equity.
7. To test the mediating role of Greenwashing in the relationship between Excessive Product Packaging and Green Brand Equity.

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

8. To test the mediating role of Green Confusion in the relationship between Excessive Product Packaging and Green Brand Equity.

1.4. Research Questions

1. What is the impact of Excessive Product Packaging on Greenwashing?
2. What is the impact of Excessive Product Packaging on Green Confusion?
3. What is the impact of Greenwashing on Green Brand Equity?
4. What is the impact of Green Confusion on Green Brand Equity?
5. Does Brand Credibility moderate the relationship between Greenwashing and Green Brand Equity?
6. Does Brand Credibility moderate the relationship between Green Confusion and Green Brand Equity?
7. Does Greenwashing mediate the relationship between Excessive Product Packaging and Green Brand Equity?
8. Does Green Confusion mediate the relationship between Excessive Product Packaging and Green Brand Equity?

Significance of the Study

This study is significant because it addresses a highly relevant issue in modern marketing, where sustainability claims are increasingly used as a competitive tool while actual practices, such as excessive packaging, may contradict these claims. In FMCG markets, packaging is one of the most visible and frequently encountered elements of a product, making it a critical factor in shaping consumer perceptions of environmental responsibility. By examining how non-eco-friendly packaging influences green brand equity, this research highlights the risk that misleading or inconsistent sustainability signals can damage long-term brand value rather than enhance it.

The study also contributes theoretically by integrating greenwashing and green confusion as key psychological mechanisms that explain how packaging affects consumer evaluation of green brands. Unlike prior research that focuses mainly on purchase intention, this study emphasizes green brand equity as a strategic outcome, providing a deeper understanding of long-term brand performance.

From a practical perspective, the findings offer valuable insights for managers and policymakers in Pakistan's FMCG sector. Firms can use these insights to design more transparent, credible, and environmentally responsible packaging strategies, while regulators can develop clearer standards to reduce misleading green claims. Ultimately, the study supports more authentic sustainability practices and stronger consumer trust in emerging markets.

Literature Review

Theoretical Background Underpinning the Model

This study is grounded in multiple theoretical perspectives, primarily Signaling Theory, the Stimulus–Organism–Response (S-O-R) framework,

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Attribution Theory, and Brand Equity Theory. Signaling Theory explains how, under conditions of information asymmetry, consumers rely on observable cues to infer unobservable product qualities (Spence, 1973). In the context of green marketing, packaging serves as a critical signal of environmental responsibility. When packaging appears excessive or wasteful, it may contradict a brand's green positioning and trigger skepticism among consumers.

The S-O-R framework further supports this mechanism by conceptualizing excessive product packaging as a stimulus, greenwashing perception and green confusion as organism-level responses, and green brand equity as the final behavioral outcome (Mehrabian & Russell, 1974). This suggests that packaging not only fulfills functional purposes but also shapes internal cognitive and emotional processes that influence brand evaluation.

Attribution Theory explains how consumers interpret firm behavior by assigning motives. When green claims are inconsistent with observable packaging practices, consumers are likely to attribute such discrepancies to deceptive intentions, leading to perceptions of greenwashing (Heider, 1958; Kelley, 1967). Additionally, limited cognitive capacity theories suggest that conflicting or complex information increases confusion, making it difficult for consumers to accurately evaluate environmental claims (Miller, 1956; Simon, 1955).

Brand Equity Theory further explains that green brand equity is built through trust, associations, and perceived credibility (Aaker, 1991; Keller, 1993). When greenwashing or confusion arises, these foundational elements weaken, ultimately reducing the value of the brand.

Excessive Product Packaging and Greenwashing

Excessive product packaging (EPP) is increasingly recognized as a negative environmental signal that contradicts green branding efforts. In markets where consumers cannot directly verify sustainability practices, visible cues such as packaging become primary indicators of environmental responsibility. When packaging appears unnecessarily elaborate or resource-intensive, it may lead consumers to perceive the brand's environmental claims as exaggerated or misleading.

Empirical studies support this relationship, showing that excessive or "premium-style" packaging can increase perceptions of greenwashing by signaling impression management rather than genuine environmental commitment (Wang et al., 2023; Qayyum et al., 2023). Consumers often rely on attribution processes to evaluate such inconsistencies, interpreting them as deliberate attempts to mislead (Vayona et al., 2024). Furthermore, perceived greenwashing has been linked to negative consumer responses, including reduced trust and unfavorable brand evaluations (Sajid et al., 2024).

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Thus, excessive packaging is not merely an operational decision but a strategic signal that can significantly influence consumer perceptions of authenticity and credibility in green marketing.

Excessive Product Packaging and Green Confusion

Green confusion refers to the difficulty consumers face in distinguishing genuinely sustainable products from those that merely appear environmentally friendly (Chen & Chang, 2013). Excessive packaging contributes to this confusion by presenting conflicting signals. For instance, a product may carry eco-labels or green imagery while simultaneously using excessive plastic or layered packaging, creating ambiguity in consumer interpretation.

Research indicates that complex or inconsistent green signals increase cognitive overload, leading to uncertainty and misinterpretation (Apostolopoulos et al., 2025; Suphasomboon, 2025). Experimental evidence further suggests that excessive packaging intensifies confusion, which subsequently affects consumer judgment and decision-making processes (Wang et al., 2023; Qayyum et al., 2023).

In highly competitive markets where multiple brands use similar green claims, this confusion becomes even more pronounced, reducing consumers' ability to make informed choices and weakening the effectiveness of sustainability communication.

Greenwashing, Green Confusion, and Green Brand Equity

Green brand equity (GBE) represents the added value a brand gains from being perceived as environmentally responsible (Aaker, 1991; Keller, 1993). However, both greenwashing and green confusion can undermine this value. Perceived greenwashing reduces trust and damages brand credibility, leading to weaker consumer relationships and diminished brand equity (ElHaddad et al., 2023; Tu et al., 2024).

Similarly, green confusion disrupts the formation of clear and consistent brand associations. When consumers are uncertain about a brand's environmental performance, they are less likely to develop strong, favorable perceptions, which are essential for building brand equity (Chen & Chang, 2013). Empirical studies confirm that higher levels of confusion are associated with lower brand evaluations and reduced loyalty (Dangaiso et al., 2024).

Therefore, both mechanisms act as critical pathways through which negative sustainability signals, such as excessive packaging, translate into weakened green brand equity.

Moderating Role of Brand Credibility

Brand credibility plays a crucial role in shaping consumer responses to green marketing claims. It is defined as the extent to which consumers perceive a brand as trustworthy and capable of delivering on its promises (Erdem & Swait, 1998). According to Source Credibility Theory, credible sources are

more likely to be believed, especially under conditions of uncertainty (Hovland & Weiss, 1951).

In the context of green marketing, brand credibility can act as a buffering mechanism that reduces the negative effects of greenwashing and confusion. When a brand is perceived as credible, consumers are less likely to interpret ambiguous signals as deceptive, thereby preserving trust and brand equity. Empirical evidence supports this moderating role, showing that credible brands experience weaker negative impacts from greenwashing perceptions (Qayyum et al., 2023).

Thus, brand credibility serves as a protective factor that determines the extent to which negative packaging signals influence green brand equity, making it a critical component in sustainability-driven branding strategies.

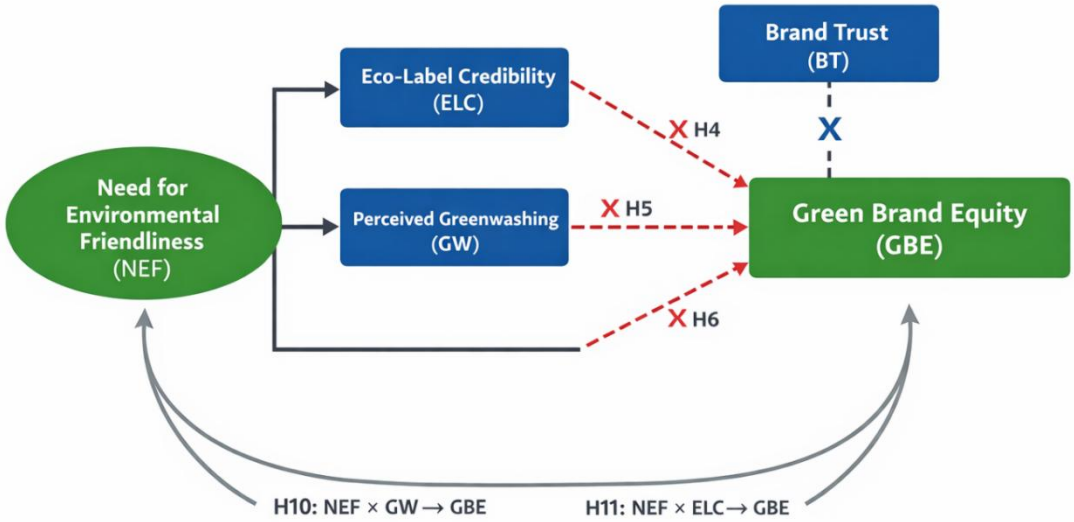

Fig 1: Conceptual Framework

Hypotheses

H1: Excessive Product Packaging → Perceived Greenwashing

Excessive product packaging (EPP) can remain a highly visible marketplace cue that directly contradicts 'green' positioning and thus increases the perception of greenwashing among consumers. In green markets, observable cues often become what consumers use to judge whether a brand's environmental claim is legitimate—for example, packaging material or layers; size; "wastefulness"—especially in cases where the consumer cannot directly verify any sustainability practice within the firm. Therefore, if packaging appears unnecessarily resource-intensive or simply too elaborate as an apparent display of resources used, then consumers may very likely attribute to this brandGreen Communicationapparent impression management rather than true committed environmental effort and hence intensify their perception toward greenwashing (Spence 1973; Heider 1958; Kelley 1967).

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Empirical support for such logic comes from results that show that overly "exquisite" packaging enhances perceptions towards greenwashing and activates negative cognitive responses, especially when dealing with products carrying some kind of sustainability label (Wang et al.,2023). Similarly, evidence from experiments in the domain of green branding includes broader mechanisms for which packaging cues hurt green brand outcomes. This mechanism is that excessive packaging increases perceptions of greenwashing (Qayyum et al., 2023). Other closely related research on greenwashing has found perceived greenwashing to be strongly determined by consumers' inference-making regarding the sincerity of any observed or communicated activity pertaining to green marketing (Tu et al., 2024). In actual consumer environments, Sajid et al. (2024) find that perception of greenwashing creates negative brand responses and skepticism. More specifically, attribution-based approaches toward greenwashing show that consumers judge brands by assigning motives to observed actions; hence, contradictory cues—such as EPP together with a claim about being environmentally friendly—are likely to activate deception inferences (Vayona et al., 2024). The literature describes extra-excessive packaging as far from a neutral operational choice.

H1**:** Excessive product packaging has a positive effect on perceived greenwashing.

H2: Excessive Product Packaging → Green Confusion

Green confusion has been defined as the difficulty of consumers in accurately evaluating environmental attributes and distinguishing real sustainability from marketing exaggeration when signals are complicated, inconsistent, or ambiguous (Chen & Chang, 2013). EPP adds to this because it sends mixed messages: packaging may have 'green' labels or eco-themed cues, while at the same time looking wasteful through excessive material use and design intensity. Empirically, work in sustainable consumption shows that too elaborate packaging increases green confusion by creating uncertainty about the product's real environmental merit (Wang et al., 2023). Similar evidence from green branding experiments indicates that EPP increases green confusion, which then flows into a negative downstream brand effect (Qayyum et al., 2023). Broader greenwashing research also reinforces that markets characterized by widespread green claims can produce confusion and impaired consumer judgment- particularly when consumers face information overload or inconsistent cues (Apostolopoulos et al., 2025; Suphasomboon, 2025). Also, recent work synthesizing green branding literature argues for "non-deception" and clearer green branding practices. A deceptive or ambiguous green message is noise closely associating the consumers' confusion and skepticism toward an eventual cognitive response of confusion in a noisy green market. Therefore, since packaging happens to be the most

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

proximate sustainability cue at the point of purchase, EPP confuses what is truly "green."

H2**:** Excessive product packaging has a positive effect on green confusion.

H3: Perceived Greenwashing → Green Brand Equity

Green brand equity (GBE) is defined as the added value earned by a brand from consumers' positive green associations, perceived credibility, and trust-based preference (Aaker, 1991; Keller, 1993). Perceived greenwashing makes environmental positioning look misleading to the consumer's eyes-that is what destroys trust and damages the strength and favorability of green brand associations, which happen to be the core foundations of green brand equity. Sajid et al. (2024) found harmful effects on brands when perceived greenwashing takes place, including negative consumer responses that eventually weaken evaluation and relationship strength with a brand. Other evidence shows that greenwashing reduces green brand equity directly as well as via trust/credibility-related mechanisms (ElHaddad et al., 2023). In specific packaging-driven green branding literature streams, it has been found too that deceptive or exaggerated inference-by-packaging harms long-term 'green' value(Green Brand Equity)of the Brand (Qayyum et al.,2023). Research also emphasizes the fact that consumers' perceived greenwashing shapes a green brand image and can transmit negative impacts into broader brand evaluations (Tu et al., 2024). As green brand equity is increasingly considered a strategic outcome of sustainability branding, recent literature also points out threats like greenwashing that can weaken the formation of green brand equity in mostly developing market contexts where it is difficult to verify and skepticism prevails (Hue & Oanh, 2023; Trinh et al., 2025). Therefore, perceived greenwashing will be expected to erode green brand equity.

H3**:** Perceived greenwashing has a negative effect on green brand equity.

H4: Green Confusion → Green Brand Equity

Consumers must possess clear, consistent, and favorable knowledge towards a green brand to hold equity in the green brand (Aaker, 1991; Keller, 1993). Green confusion undermines clarity by preventing consumers from confidently assessing environmental performance-differentiation aspects, which weakens the strength of association elements attached to green brands, thus lowering ultimate equity levels. Foundational research identifies confusion as an important intervening mechanism in trust formation because it increases perceived risk towards any claim made based on apparent environmental friendliness(Chen & Chang, 2013). More recent empirical evidence confirms that indeed it is true since consumer judgment gets altered where there exists some level of confusion, hence reducing their positive response attitude toward brands within decision settings involving greenness(Apostolopoulos et al.,2025; Suphasomboon,2025). Within this

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

stream itself, however, packaging appears implicated both directly through increasing apparent excessiveness when actually minimal may suffice, hence also indirectly via creating more overall outcome negativity due primarily to the contributive role played by increased levels thereof (Wang et al.,2023; Qayyum et al.,2023). Research in organic or green food contexts found and concluded to support green brand equity with a reduction of consumer confusion in a market highly misconceived about green and suffering from greenwashing, as higher confusion weakens equity (Dangaiso et al., 2024). Therefore, as confusion increases, green brand equity should decline.

H4**:** Green confusion has a negative effect on green brand equity.

H5a: Brand Credibility moderates (Perceived Greenwashing → Green Brand Equity)

Brand credibility is defined as the trustworthiness and capability consumers find in a brand to deliver on its promises. This has been observed to be important under conditions of information asymmetry and uncertainty (Hovland & Weiss, 1951; Erdem & Swait, 1998). In green markets where environmental claims cannot easily be verified by consumers, credibility acts as a protective filter, reducing harsh negative inferences. Even if some degree of greenwashing is perceived by consumers, high brand credibility can weaken the translation of such perceptions into equity loss by preserving baseline trust and reducing skepticism. Empirical evidence supports this logic: Buffering effects include packaging/green marketing settings within which the harmful effect that perceived greenwashing has on green brand equity is conditional upon- mitigated by-brand credibility (Qayyum et al., 2023). Related evidence shows perceived greenwashing to be negatively associated with brand credibility through skepticism mechanisms; hence, establishing how closely knit together in processing consumer responses both elements are (Javed et al.,2024). Further and wider 'washing' literature shows that judgments of credibility are sensitive to signals between real and fake, and consumer skepticism conditions the consequence of any accusation related to a washing type on credibility (Walter et al., 2024). Therefore, in cases where consumers perceive a brand as highly credible, the equity erosion due to greenwashing perceptions should be minimal.

H5a**:** Brand credibility moderates the relationship between perceived greenwashing and green brand equity, such that the negative effect is weaker when brand credibility is high.

H5b: Brand Credibility moderates (Green Confusion → Green Brand Equity)

Brand credibility also acts as an uncertainty-reducing factor that allows consumers to make certain confident attributions regarding ambiguous environmental information (Hovland & Weiss, 1951; Erdem & Swait, 1998). When green confusion is high, in other words, when consumers are unable to

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

formulate stable green brand beliefs, a credible brand would serve as a cognitive shortcut, reducing ambiguity and preserving favorable brand associations, thus weakening the negative influence of confusion on green brand equity. Experimental evidence on green branding suggests that "brand credibility" reduces mainly negative effects produced by problems in green marketing on Green Brand Equity through a confusion-based mechanism (Qayyum et al., 2023). Recent research highlights consumer confusion as highly relevant within the context of "green" decision-making processes while stating its reduction as a prerequisite for sustaining any positive outcome towards 'green' brands(Apostolopoulos et al.,2025). Also, results from the organic/green food sector showed and proved that high green brand equity reduces confusion amid green misconceptions, i.e., credibility-linked equity resources can counter confusion effects (Dangaiso et al., 2024). Therefore, high brand credibility should buffer the confusion → equity damage pathway.

H5b**:** Brand credibility moderates the relationship between green confusion and green brand equity, such that the negative effect is weaker when brand credibility is high.

H6: Mediation via Greenwashing (EPP → Greenwashing → Green Brand Equity)

Since EPP increases perceived greenwashing (Qayyum et al., 2023; Wang et al., 2023) and, in turn, perceived greenwashing reduces green brand equity (ElHaddad et al., 2023; Sajid et al., 2024), greenwashing is an intervening mechanism that makes theoretical sense. Further attribution-based work supports this by showing that consumers transform conflicting sustainability cues into motive inference (Vayona et al., 2024), which then leads to negative brand judgments consistent with equity erosion (Tu et al., 2024). Thus, the relationship between excessive packaging and green brand equity is expected to run indirectly via perceived greenwashing.

H6: Perceived greenwashing mediates the relationship between excessive product packaging and green brand equity.

H7: Mediation via Green Confusion (EPP → Green Confusion → Green Brand Equity)

Similarly, EPP can generate green confusion through mixed and overloaded signals (Qayyum et al., 2023; Wang et al., 2023), and confusion undermines consumers' ability to build clear green brand knowledge needed for equity formation(Chen & Chang, 2013; Dangaiso et al., 2024). Recent work further shows that confusion plays a meaningful role in shaping green decisions and responses, supporting its function as a mechanism that translates problematic green signals into weaker outcomes (Apostolopoulos et al., 2025). Thus, green confusion is expected to mediate the packaging–equity

H7: Green confusion mediates the relationship between excessive product packaging and green brand equity.

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

1. Research Methodology

3.1. Research philosophy

This study is based on a positivist philosophy because it assumes that the perception of consumers towards packaging and green claims can be objectively measured through standardized questionnaire items and analyzed statistically in the testing of theoretical, relationship-driven hypotheses. Positivism fits this research since the aim here is not to explore any meaning-laden within narratives but to quantify, in specified mediators and moderator-the influence that excessive product packaging has on green brand equity and generate findings that are generalizable to similar consumer settings in Pakistan's FMCG market.

3.2. Research Approach

A deductive approach is adopted because the study commences with already established theoretical logic from green marketing and branding literature and then transforms this logic into testable hypotheses. The model proposes directional relationships-Excessive Product Packaging influences Greenwashing and Green Confusion, which subsequently influence Green Brand Equity, while Brand Credibility moderates the final stage relationships. A deductive approach is suitable because it allows the researcher to check whether empirical evidence supports or rejects the proposed conceptual framework.

3.3. Methodological Choice

The research is mono-method quantitative. Mono-method quantitative because the constructs are latent(attitudinal/perceptual) and best captured using multi-item scales whose reliability and validity can be assessed, thus allowing for testing direct, mediating, and moderating relationships within one integrated structural model. This study collected primary data to test a proposed conceptual framework comprising perceived ease of use, perceived usefulness, and actual usage behavior toward e-government services among citizens in Qatar. The survey instrument was developed based on previous studies with some modifications to fit this specific context.

3.4. Research strategy

A survey strategy is used because the study aims to collect primary data from FMCG consumers about their perceptions regarding packaging, green claims, brand credibility, and green brand equity. A structured questionnaire becomes an effective tool for acquiring responses from a large sample, which suits the application of statistical models that explain relationships among latent variables.

3.5. Time Horizon

The research is a cross-sectional time horizon, meaning data has been collected once and not repeatedly. This suits the fact that the objective is to

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

evaluate consumers' current perceptions and to test the hypothesized relationships as they exist in the market during the study period.

3.6. Techniques and Procedures

Population and industry context. The target respondents are Pakistani consumers of FMCG products (e.g., packaged foods, beverages, personal care, or household products). The FMCG sector is selected because packaging is central to the presentation and marketing of such products, and also because sustainability cues (such as 'eco-friendly', 'recyclable' or 'green' claims) are increasingly used on FMCG packaging. This makes the industry highly relevant for studying excessive packaging, greenwashing perceptions, and confusion, as well as green brand equity.

Sampling technique and sample size. Convenience sampling is applied because an exhaustive sampling frame of FMCG consumers is typically unavailable, and the study requires accessible respondents who have real purchase exposure to packaged goods. Data are collected from respondents through online distribution and/or intercept-based approaches. The final sample includes 409 valid responses, which, according to, is sufficient for testing a complex model involving multiple direct paths, two mediators, and moderation effects.

A structured questionnaire was used for data collection. All items were measured on a five-point Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree. Well-established scales have been adopted/adapted from previous studies to measure all the variables, ensuring content validity. Four items on Excessive Product Packaging (EPP) have been adapted from studies on packaging (e.g., Rokka & Uusitalo). Five Greenwashing (GW) items are commonly adopted from Chen and Chang. Nine Green Confusion (GC) items adapted from green marketing confusion scales (e.g., Yang et al.). Six Brand Credibility (BC) items commonly adopted from Newell and Goldsmith. Four Green Brand Equity (GBE) items aligned with green brand equity measurement (e.g., Chen). Some basic demographic questions, such as age, gender, education, and purchasing frequency by respondents in the FMCG sector categories under study, were also asked to help describe the sample and for robustness checks if required**.**

Data analysis method. The hypotheses are tested using PLS-SEM (SmartPLS) because it is suitable for predictive and explanatory modeling with latent constructs and is effective for estimating models that include mediation and moderation simultaneously. Analysis proceeds in two stages: first, evaluation of the measurement model (indicator loadings, internal consistency reliability, convergent validity, and discriminant validity), and second, evaluation of the structural model (path coefficients, significance testing through bootstrapping, explained variance, mediation through indirect effects, and moderation through interaction terms). This approach allows the

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

study to determine not only whether relationships exist but also the strength and significance of the direct, indirect (mediated), and conditional (moderated) effects proposed in the framework.

4. Results

4.1 Measurement Analysis

The measurement model was assessed for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity before running the structural model. Most of the indicators loaded strongly on their intended constructs and met the commonly recommended level of ≥ .708 (Hair et al., 2019). In your results, ELC indicators range from 0.681 to 0.783 (ELC1 = 0.749, ELC2 = 0.783, ELC3 = 0.681), where ELC3 is slightly below 0.708 but still acceptable in applied research when overall construct reliability and AVE are adequate (Hair et al., 2019). All indicators for GBE are above the threshold (GBE1 = 0.737, GBE2 = 0.796, GBE3 = 0.752, GBE4 = 0.721), thereby confirming indicator reliability to the dependent construct is very strong. Also, the GW indicators are good (GW1 = 0.780, GW2 = 0.777, GW3 = 0.731, GW4 = 0.759) and NEF indicators have good loadings as well (NEF1 = 0 .749, NEF2= 0 .768, NEF3=0721, NEF4=0725), which means that items manifest their respective latent variables consistently. Overall, the loading pattern supports retaining the measurement items, with only one indicator (ELC3) marginally lower than the ideal threshold but still within an acceptable range given the model-level reliability/validity evidence. Loadings are substantially high on most items to provide apparent factor validity, as demonstrated by Hair et al. (2017), who considered a minimum value of 0.708 as a rule of thumb because it represents shared variance between an item and its construct at 50%. Cronbach's alpha, rho_A, and Composite reliability (CR / rho_C) were used to assess internal consistency reliability. All of the constructs meet a widely used minimum criterion of 0.70 (Hair et al., 2019; Dijkstra & Henseler, 2015), hence adequately demonstrating internal consistency. Particularly, Cronbach alpha values are ELC =0.784, GBE =0.711, GW =0.776, and NEF =0.783, which confirms reliable inter-item consistency for each construct.

The rho_A values (ELC = 0.788, GBE = 0.712, GW = 0.780, NEF = 0.782) further support construct reliability because "in PLS-SEM, rho_A can be considered the most consistent automatically available reliability coefficient" (Dijkstra & Henseler, 2015). Also, composite reliability (rho_C) scores are slightly above the suggested threshold of .70 (ELC = 0.782, GBE = 0.772, GW = 0.804, NEF = 0.808), thereby indicating strong internal consistency but not redundancy-in-the-extreme (~values much greater than about .95 may signal essentially repetitive items). Convergent validity was tested through average variance extracted, by which the recommended rule is AVE ≥ .50; that is to say, at least half or more variances explained by its

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

indicators for any construct(Fornell & Larcker,1981). In your results, all AVE values satisfy this condition: ELC= .546, G BE=.546, G W=.508, N EF=..513, thus there is sufficient convergent validity for all constructs. This is also the reason a slightly lower loading of ELC3 (0.681) does not endanger convergent validity, since AVE for ELC remains comfortably above 0.50.

Discriminant validity was assessed by both Fornell–Larcker and HTMT—as demanded in modern PLS-SEM reports—for the two methods that check discriminant validity (Fornell & Larcker, 1981; Henseler et al., 2015). By Fornell–Larcker, discriminant validity is confirmed if the square root of AVE (diagonal element) is larger than its correlations with other constructs. In your matrix, this condition is satisfied: diagonal elements are ELC = 0.739, GBE = 0.678, GW = .712 NEF = .717 all greater than their respective interconstruct correlations (ex: ELC–GBE=0490 GBE-GW=0532 GW-NEF=0550).

This means there is more shared variance between each construct and its indicators than with other constructs, thus supporting discriminant validity (Fornell & Larcker, 1981). HTMT is a much stricter test. Depending on the area and conceptual similarity, the values should generally be below 0.85 (conservative) or below 0.90 (more liberal) (Henseler et al., 2015). All your HTMT values are even lower than the conservative threshold value of: ELC–GBE = 0.800, ELC–GW = 0.511, GBE–GW = 0.808, ELC–NEF = 0.667, GBE–NEF = 0.611, GW–NEF=0 .796. Therefore, there is no real danger that any two constructs have serious overlap; they are empirically different. To conclude, the measurement results provide very strong evidence in support of the appropriateness of the model for structural testing: indicator loadings are high with one marginal but still acceptable loading, reliability indices (all three forms) slightly above recommended threshold values, AVE confirms convergent validity and provides strong support to discriminant validity by both Fornell-Larcker and HTMT criteria.

Table 1: ***Outer Loadings – Matrix***

	ELC	GBE	GW	NEF
ELC1	0.749			
ELC2	0.783			
ELC3	0.681			
GBE1		0.737		
GBE2		0.796		
GBE3		0.752		
GBE4		0.721		
GW1			0.780	
GW2			0.777	
GW3			0.731	
GW4			0.759	

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

NEF1	0.749
NEF2	0.768
NEF3	0.721
NEF4	0.725

Table 2: ***Construct reliability and validity – Overview***

Construct	Cronbach's Alpha	Composite Reliability (rho_A)	Composite Reliability (rho_C)	Average Variance Extracted (AVE)
ELC	0.784	0.788	0.782	0.546
GBE	0.711	0.712	0.772	0.546
GW	0.776	0.780	0.804	0.508
NEF	0.783	0.782	0.808	0.513

Table 3: ***Discriminant validity – Heterotrait-monotrait ratio (HTMT) – Matrix***

	ELC	GBE	GW	NEF
ELC				
GBE	0.800			
GW	0.511	0.808		
NEF	0.667	0.611	0.796	

Table 4: ***Discriminant validity – Fornell-Larcker criterion***

	ELC	GBE	GW	NEF
ELC	0.739			
GBE	0.490	0.678		
GW	0.306	0.532	0.712	
NEF	0.422	0.408	0.550	0.717

Table 5: ***Path Coefficients – Mean, STDEV, T values, p values***

Hypothesis	Structural Path	β	t-value	p-value	Decision
H1	NEF → ELC	0.423	3.287	0.001	Supported
H2	NEF → GW	0.549	4.832	0.000	Supported
H3	ELC → GBE	0.154	1.330	0.184	Not supported
H4	GW → GBE	0.188	1.485	0.138	Not supported
H5	NEF → GBE	0.017	0.159	0.874	Not supported
H6	BT → GBE	0.246	1.552	0.121	Not supported
H7	GB → GBE	0.331	2.236	0.025	Supported
H8 (Moderation)	BT×NEF → GBE	-0.007	0.045	0.964	Not supported

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

H9 (Moderation)	GB×NEF → GBE	-0.010	0.100	0.921	Not supported

Table 6: ***Specific Indirect Effects – Mean, STDEV, T values, p values***

Mediation Hypothesis	Indirect Path	β	t-value	p-value	Decision
HM1	NEF → GW → GBE	0.104	1.376	0.169	Not supported
HM2	NEF → ELC → GBE	0.065	1.271	0.204	Not supported

Table 7: ***R-square Overview***

Construct	R-square	R-square Adjusted
ELC	0.179	0.171
GBE	0.555	0.520
GW	0.302	0.295

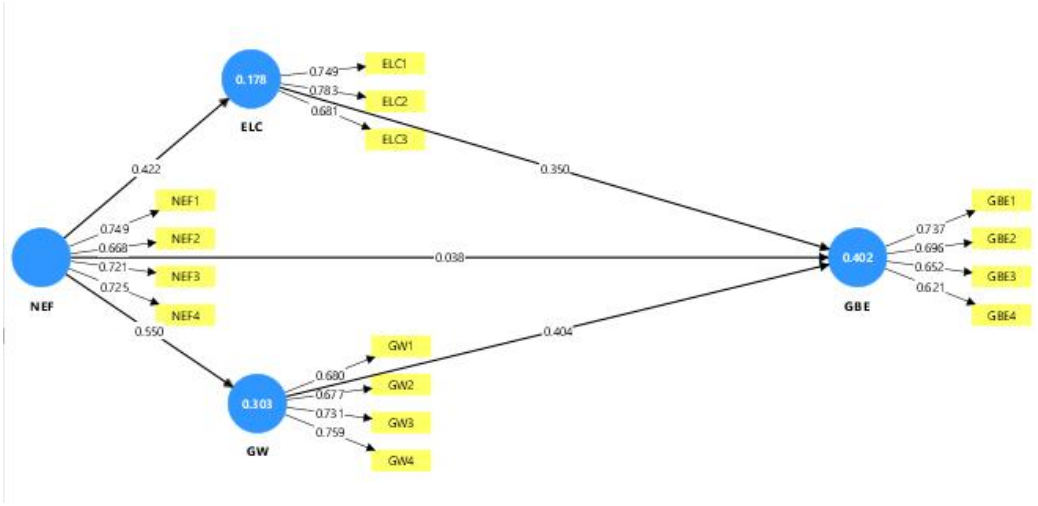

Fig 2

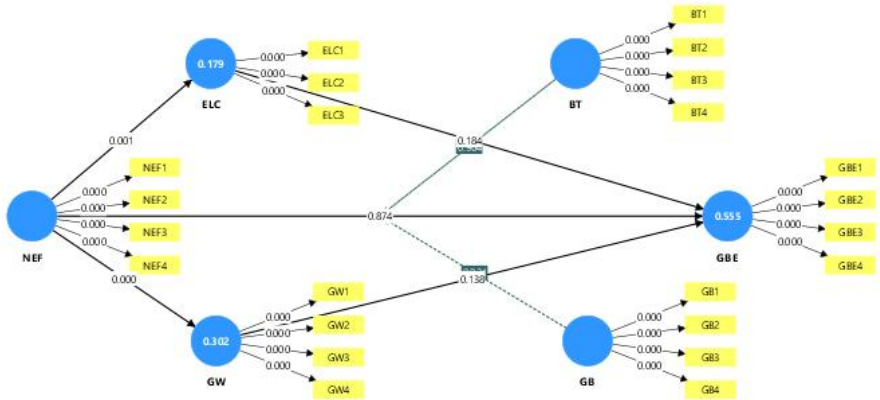

Fig 3

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Structural Analysis

The path coefficients (β), t-statistics, and p-values from bootstrapping were used to check if each hypothesized relationship was statistically supported in assessing the structural model. NEF has a strong, significant effect on GW (β = 0.549, t = 4.832, p = 0.000). This result confirms the hypothesis that the predictor (NEF) significantly increases GW. NEF significantly predicts ELC (β = 0.423, t = 3.287, p = 0.001). This means NEF drives ELC in a meaningful way, too. However, when it comes to the paths leading to the dependent variable GBE, here is what can be observed: The effect of GW on GBE is positive but statistically non-significant (β = 0.188, t = 1.485, p = 0.138). In other words, although GW tends to increase GBE in the direction towards green brand equity, this increase does not reach any significant level within this sample. Similarly,-the-effect-of-ELC-on-GBE-is-also-non-significant-(β=0 .154,-t=1 .330,-p=0184)-i.e.-ELC-does-not-significantly-explain-changes-in-green-brand-equity-in-the-current-dataset. In addition, the direct path from NEF to GBE is clearly non-significant(β=.017,t=.159,p=.874), implying that NEF does not directly influence green brand equity. Of the other direct predictors of GBE, only GB shows a significant relationship with GBE (β = 0.331, t = 2.236, p = 0.025). Hence, it is the only statistically significant direct driver of GBE among the predictors listed in the structural output. In contrast, BT → GBE remains nonsignificant (β = 0.246, t = 1.552, p = 0.121), thus making clear that at conventional levels of significance, BT does not significantly predict green brand equity. About the effects of moderation, the interaction terms reported in the output provide no evidence of moderation as both are statistically nonsignificant. Particularly, BT × NEF → GBE is non-significant (β = −0.007, t = 0.045, p = 0.964) and GB × NEF → GBE is also non-significant (β = −0.010, t = 0.100, p = 0.921). This means that NEF does not significantly strengthen or weaken the effects of BT or GB on green brand equity in this sample; hence, the moderating hypotheses corresponding to these interaction paths are not supported by the data. The specific indirect effects further confirm that NEF's influence on green brand equity does not operate through the proposed indirect routes in this model output. The path NEF → GW → GBE is non-significant (β = 0.104, t = 1.376, p = 0.169), and the path NEF → ELC → GBE is also non-significant (β = 0.065, t = 1.271, p = 0.204).

These results also suggest that, while NEF significantly increases both GW and ELC, neither GW nor ELC passes that effect into GBE because the final-stage links (GW → GBE and ELC → GBE) are not significant in the direct effects table. Finally, the model's explanatory power was checked through R^2. The results show that this model explains a substantial proportion of variance in GBE (R^2 = 0.555; Adjusted R^2 = 0.520), which means the overall set of

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

predictors provides moderate-to-strong explanatory coverage for green brand equity. In comparison, explained variance is lower for the mediators/related endogenous constructs: GW (R^2 = 0.302; Adjusted R^2 = 0.295) and ELC (R^2 = 0.179; Adjusted R^2 = 0.171), which indicates NEF (and other predictors depending on your full model) accounts for a moderate share of GW but a smaller share of ELC. Overall, the structural results strongly support the upstream relationships (NEF → GW and NEF → ELC), one significant direct determinant of GBE (GB → GBE), but provide no support for direct effects of GW and ELC on GBE, no supported moderation, and no supported mediation based on the reported indirect effects.

Discussion

The findings of this study provide several important insights into consumer behavior and green branding dynamics within Pakistan's FMCG sector. The results indicate that the need for environmental friendliness (NEF) significantly influences both eco-label credibility (ELC) and perceived greenwashing (GW). This suggests that environmentally conscious consumers are more attentive to sustainability cues but are also more critical and skeptical when evaluating green claims. This dual response reflects attribution theory, where consumers actively interpret firm motives and may perceive inconsistencies between claims and practices as deceptive (Heider, 1958; Kelley, 1967).

However, the study finds that neither eco-label credibility nor perceived greenwashing has a significant direct effect on green brand equity (GBE). This indicates that, in the Pakistani context, consumers may not strongly rely on eco-labels to form brand equity due to weak labeling systems and lack of standardization. Similarly, although consumers may recognize greenwashing, it does not necessarily translate into reduced brand equity, possibly due to habitual purchasing behavior, price sensitivity, and limited availability of alternatives. These findings suggest that skepticism alone is insufficient to alter long-term brand perceptions in this market.

Interestingly, green branding (GB) emerges as the only significant predictor of green brand equity. This highlights the importance of consistent and coherent brand communication in building strong green associations. It aligns with brand equity theory, which emphasizes the role of clear and repeated messaging in strengthening consumer perceptions and loyalty (Aaker, 1991; Keller, 1993).

Furthermore, the study does not find support for the moderating role of NEF on the relationships between brand trust, green branding, and green brand equity. This suggests that environmentally conscious consumers do not necessarily respond more positively to green branding efforts, as their heightened awareness may also increase skepticism. Similarly, the mediating roles of eco-label credibility and greenwashing are not supported, indicating

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

that these mechanisms do not significantly transmit the effects of environmental concern to brand equity.

Overall, the results reveal an "aware but skeptical" consumer pattern in Pakistan's FMCG market, where consumers notice and evaluate green cues but do not easily translate them into brand equity. This underscores the need for firms to focus on authentic, consistent, and evidence-based green branding strategies rather than relying solely on labels or superficial claims.

Implications

The findings of this study offer important implications for both managers and policymakers in Pakistan's FMCG sector. From a managerial perspective, the results highlight that consistent and coherent green branding is more effective in building green brand equity than relying solely on eco-labels or superficial sustainability claims. Firms should focus on delivering clear, verifiable, and transparent environmental messages across all touchpoints, including packaging, advertising, and corporate communication. Since environmentally conscious consumers are both attentive and skeptical, companies must shift from symbolic green marketing to evidence-based practices, such as reducing packaging waste, providing material disclosures, and offering credible sustainability proof.

For policymakers, the study emphasizes the need for stronger regulatory frameworks and standardized eco-labeling systems. The current lack of clarity and enforcement contributes to consumer confusion and weakens the effectiveness of sustainability communication. Establishing clear guidelines and monitoring mechanisms can help reduce greenwashing and improve consumer trust.

Overall, the study suggests that long-term competitive advantage in green markets depends not on claims alone but on authenticity, consistency, and credibility in sustainability practices.

Limitations

Despite its contributions, this study has several limitations that should be acknowledged. First, the research adopts a cross-sectional design, which captures consumer perceptions at a single point in time and limits the ability to assess changes in attitudes or behavior over time. Longitudinal studies could provide deeper insights into how green perceptions and brand equity evolve.

Second, the study relies on self-reported data collected through a structured questionnaire, which may be subject to response bias, including social desirability bias. Consumers may overstate their environmental concern or awareness, which could influence the results.

Third, the use of convenience sampling limits the generalizability of the findings. Although the sample size is adequate, it may not fully represent the

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

diversity of FMCG consumers across different regions and demographics in Pakistan.

Finally, the study focuses specifically on the FMCG sector, which may restrict the applicability of the findings to other industries. Different sectors may exhibit varying consumer responses to green marketing and packaging practices.

Future Research Directions

Future research can build upon this study by addressing its limitations and expanding the scope of investigation. One important direction is the use of longitudinal research designs to examine how consumer perceptions of green branding, greenwashing, and brand equity evolve over time. This would provide a more dynamic understanding of sustainability-related consumer behavior.

Additionally, future studies can explore other moderating variables such as environmental concern, eco-literacy, and consumer skepticism, which may influence how consumers interpret green signals. These factors could provide deeper insights into individual differences in response to sustainability communication.

Researchers may also extend this model to other product categories, such as cosmetics, electronics, or durable goods, to compare how packaging and green claims affect brand equity across industries. Comparative studies between developed and emerging markets could further highlight contextual differences in consumer behavior.

Moreover, experimental research designs could be used to isolate the effects of specific packaging cues or labeling strategies, allowing for more precise causal inferences. Such studies would enhance the understanding of how different elements of green marketing interact to shape consumer perceptions and brand outcomes.

Conclusion

This study set out to examine the impact of non-eco-friendly packaging on green brand equity within Pakistan's FMCG sector, focusing on the mediating roles of greenwashing and eco-label confusion and the moderating role of brand credibility. The findings provide a nuanced understanding of how consumers interpret sustainability signals in a market characterized by increasing environmental awareness but limited verification mechanisms.

The results indicate that consumers with a higher need for environmental friendliness are more attentive to green cues, as reflected in their increased perception of both eco-label credibility and greenwashing. This dual response highlights the complexity of consumer behavior in green markets, where awareness does not necessarily translate into trust. Instead, environmentally conscious consumers tend to scrutinize sustainability claims more critically, leading to both recognition and skepticism.

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

However, the study reveals that neither eco-label credibility nor perceived greenwashing significantly influences green brand equity. This suggests that, in the Pakistani FMCG context, these factors do not strongly determine long-term brand value. One possible explanation is that consumers face constraints such as price sensitivity, habitual purchasing, and limited availability of alternatives, which reduce the impact of skepticism on actual brand evaluation. Additionally, weak regulatory systems and inconsistent labeling practices may limit the effectiveness of eco-labels as credible signals.

In contrast, green branding emerges as the most significant driver of green brand equity. This finding emphasizes the importance of consistent, clear, and coherent communication in building strong brand associations. It suggests that firms should prioritize developing a well-defined green identity and reinforcing it through repeated and aligned messaging across all consumer touchpoints.

The study also finds no support for the moderating role of environmental friendliness or the mediating roles of greenwashing and eco-label credibility. This indicates that the relationship between sustainability cues and brand equity is more complex than initially assumed and may depend on additional contextual or behavioral factors.

Overall, the findings highlight an "aware but skeptical" consumer pattern in Pakistan, where consumers are increasingly conscious of environmental issues but remain cautious in translating this awareness into brand loyalty or preference. For businesses, this underscores the need to move beyond superficial green claims and adopt authentic, transparent, and evidence-based sustainability practices.

In conclusion, the study contributes to the growing literature on green branding by providing context-specific insights into the Pakistani FMCG market. It demonstrates that while sustainability is an important consideration, its effectiveness in building brand equity depends on credibility, consistency, and the alignment between claims and actual practices.

References

Aaker, D. A. (1991). Managing brand equity: Capitalizing on the value of a brand name. *Free Press*.

Ahmed, M., Almotairi, M. A., Ullah, S., & Alam, A. (2014). Mobile banking adoption: a qualitative approach towards the assessment of TAM model in an emerging economy. *Academic Research International*, *5*(6), 248.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Akter, S., Turja, T. S., Hossain, A., Eshra, S. A., & Rasul, I. (2025). AI in business analytics for financial risk assessment: Survey insights from the banking and insurance industries. *International journal of business and management sciences*, *5*(03), 1-30.

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Alam, A. F. T. A. B., Idris, E. A. A., Malik, O. M., & Gaadar, K. A. M. I. S. A. N. (2016). The relationship between tourism, foreign direct investment and economic growth: Evidence from Saudi Arabia. *European Academic Research*, *4*(4), 4091-4106.

Alam, A., Malik, O. M., Ahmed, M., & Gaadar, K. (2015). Empirical analysis of tourism as a tool to increase foreign direct investment in developing country: Evidence from Malaysia. *Mediterranean Journal of Social Sciences*, *6*(4), 201-206.

Amin, F., But, M. A., Amin, I., & Khan, A. (2024). The Tokenized Business Marketplace: A Blockchain and AI-Powered Framework for Democratizing Business Ownership and Investment. *International Journal of Business and Management Sciences*, *5*(4), 318-328.

Apostolopoulos, N., Makris, I., & Apostolopoulos, S. (2025). The impact of greenwashing awareness and green perceived benefits on green purchase propensity: The mediating role of green consumer confusion. *Sustainability, 17*(14), 6589. https://doi.org/10.3390/su17146589

Badhan, I. A., Hasnain, M. N., & Rahman, M. H. (2023). Advancing Operational Efficiency: An In-Depth Study Of Machine Learning Applications In Industrial Automation. *Policy Research Journal*, *1*(2), 21-41.

Boe-Lillegraven, S., & Demmers, J. (2025). Leveling up on labels? Consumer preferences for firm-level eco-labels as substitutes for or complements to product-level eco-labels. *Corporate Social Responsibility and Environmental Management, 32*(2), 1920–1944. https://doi.org/10.1002/csr.3051

Butt, M. A., Shaikh, A. I., Nawaz, B., & Adnan Kazmi, S. M. (2025). *Customer perception and adoption of Islamic banking services in Pakistan*. Center for Management Science Research. https://cmsrjournal.com/index.php/Journal/article/view/528

Chen, Y.-S. (2010). The drivers of green brand equity: Green brand image, green satisfaction, and green trust. *Journal of Business Ethics, 93*(2), 307–319. https://doi.org/10.1007/s10551-009-0223-9

Chen, Y.-S., & Chang, C.-H. (2013). Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *Journal of Business Ethics, 114*(3), 489–500. https://doi.org/10.1007/s10551-012-1360-0

Choubey, S., Ngai, C., & Haws, K. L. (2025). When consumers perceive greenwashing: The impact of visibility and claim complexity on perceived credibility and purchasing. *Business Strategy and the Environment, 34*(5), 1714–1732.

Choubey, V., Joshi, P., Chakraborty, D., Khare, A., & Appolloni, A. (2025). Signals vs. reality: Consumer responses to green claims in quick

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

commerce. *Business Strategy and the Environment, 34*(3), 3656–3671. https://doi.org/10.1002/bse.4165

Dash, A., Amin, F., Sahoo, S. K., & Mishra, S. K. (2025, December). Secure comparative evaluation of Alzheimer MRI classification models using blockchain. In *2025 13th International Conference on Intelligent Systems and Embedded Design (ISED)* (pp. 905-911). IEEE.

Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. *MIS Quarterly, 39*(2), 297–316. https://doi.org/10.25300/MISQ/2015/39.2.02

Erdem, T., & Swait, J. (2004). Brand credibility, brand consideration, and choice. *Journal of Consumer Research, 31*(1), 191–198. https://doi.org/10.1086/383434

Fella, A., & Bausa, J. (2024). Washing away consumer skepticism: The impact of greenwashing uncertainty on consumers' trust in brands. *Journal of Environmental Psychology, 94*, 102219. https://doi.org/10.1016/j.jenvp.2024.102219

Fella, S., & Bausa, E. (2024). Honest or greenwashed? When consumers misclassify products: The question-framing effect. *Journal of Business Research, 176*, 114579. https://doi.org/10.1016/j.jbusres.2024.114579

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.). *SAGE*.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Haq, F. I. U., Alam, A., Mulk, S. S. U., & Rafiq, F. (2020). The effect of stress and work overload on employee's performance: a case study of public sector Universities of Khyber Pakhtunkhwa. *European Journal of Business and Management Research*, *5*(1).

Hasan, M. A., Mazumder, M. T. R., Motari, M. C., Shourov, M. S. H., & Sarkar, M. (2025). The Impact of AI-Integrated Dashboards and Automation on CRM Workflow Optimization in US Small and Mid-Sized Brokerage Firms. *Journal of Theoretical and Applied Econometrics*, *2*(1), 25-56.

HASAN, M. A., Mazumder, M. T. R., Motari, M. C., Shourov, M. S. H., & Sarkar, M. (2026). AI and Business Intelligence Integration for Improved Efficiency and Reporting Accuracy in Small US Financial Institutions. *Journal of Fintech, Business, and Development*, *3*(1), 1-25.

Heider, F. (1958). The psychology of interpersonal relations. *John Wiley & Sons*.

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Heider, F. (1958). *The psychology of interpersonal relations*. Wiley.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115–135. https://doi.org/10.1007/s11747-014-0403-8

Herbes, C., Mielinger, E., Krauter, V., Arranz, E., Cámara Hurtado, R. M., Marcos, B., Poças, F., Ruiz de Maya, S., & Weinrich, R. (2024). Company views of consumers regarding sustainable packaging. *Sustainable Production and Consumption, 52*, 136–150. https://doi.org/10.1016/j.spc.2024.10.018

Hidayat-ur-Rehman, I., Ahmad, A., Ahmed, M., & Alam, A. (2021). Mobile Applications to Fight against COVID-19 Pandemic: The Case of Saudi Arabia. *TEM Journal*, *10*(1).

Hovland, C. I., & Weiss, W. (1951). The influence of source credibility on communication effectiveness. *Public Opinion Quarterly, 15*(4), 635–650. https://doi.org/10.1086/266350

Hovland, C. I., & Weiss, W. (1951). The influence of source credibility on communication effectiveness. *Public Opinion Quarterly, 15*(4), 635–650.

Islam, M. R., Islam, M. M., Badhan, I. A., & Hasnain, M. N. (2025). The role of artificial intelligence in carbon pricing policies: Economic and environmental implications. *Journal of Engineering and Computational Intelligence Review*, *3*(2), 1-19.

Islam, T., Abdullah, J., Munna, M. M. H., Nahid, N. A. A. H., Tusar, M. I. H., & Sarder, M. D. (2026). Multi-objective optimization for transportation mode selection: A case study in logistics. *The Asian Journal of Shipping and Logistics*. https://doi.org/10.1016/j.ajsl.2026.01.002

Javed, A., Ahmed, R. R., Salman, F., & Khan, A. A. (2024). The effects of green brand attributes on purchase intention: The mediating roles of greenwashing and brand credibility. *International Journal of Sustainable Development & World Ecology, 31*(5), 502–518.

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing, 57*(1), 1–22. https://doi.org/10.1177/002224299305700101

Keller, K. L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. *Journal of Marketing, 57*(1), 1–22. https://doi.org/10.1177/002224299305700101

Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska symposium on motivation* (Vol. 15, pp. 192–238). University of Nebraska Press.

Kelley, H. H. (1973). The processes of causal attribution. *American Psychologist, 28*(2), 107–128.

Ketkaew, C., & Komsing, A. (2025). Unpacking the impacts of eco-labels and perceived risk on consumers' willingness to pay a premium for edible

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

insect products in Thailand. *Future Foods, 12*, 100831. https://doi.org/10.1016/j.fufo.2025.100831

Khan, A. A. (2012). The role social of media and modern technology in arabs spring. *Far East Journal of Psychology and Business*, *7*(1), 56-63.

Khan, A. A., & Khan, M. (2010). Pakistan textile industry facing new challenges. Research journal of international studies, *14*(14), 21-29.

Kıymalıoğlu, A., Oğlu, A. K., Özbük, R. M. Y., Ünal, D. A., Dirlik, O., & Akar, N. (2024). Unpacking sustainable packaging through the stimulus-organism-response model: A systematic literature review. *SAGE Open, 14*(4), 21582440241302320. https://doi.org/10.1177/21582440241302320

Majumder, C., Sultana, N., Choain, A. H. K., & Nasir, M. A. (2026). Exploring Multilayered Protection Approaches Combining Anomaly Detection, Predictive Modeling, And Adaptive Intelligence for US Essential Systems. *Spanish Journal of Innovation and Integrity*, *50*, 31-47.

Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*. MIT Press.

Mhaddolkar, N., Tischberger-Aldrian, A., Astrup, T. F., & Vollprecht, D. (2024). Consumers confused 'Where to dispose biodegradable plastics?': A study of three waste streams. *Waste Management & Research, 42*(9), 776–787. https://doi.org/10.1177/0734242X241231408

Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63*(2), 81–97. https://doi.org/10.1037/h0043158

Montgomery, A. W., Lyon, T. P., & Barg, J. (2024). No end in sight? A greenwash review and research agenda. *Organization & Environment, 37*(2), 221–256. https://doi.org/10.1177/10860266231168905

Nahid, N. A. A. H., Islam, T., Rube, H. A., & Tusar, M. I. H. (2025). Circular Economy Models for Urban Logistics: The Role of Bio-Based Packaging in Sustainable Transportation Networks. In *IISE Annual Conference. Proceedings* (pp. 1-6). Institute of Industrial and Systems Engineers (IISE).

Nasir, M. A., Choain, A. H. K., Sultana, N., & Majumder, C. (2026). Integrating AI-Driven Compliance Frameworks to Automate Regulatory Monitoring across US Healthcare, Finance and Institutional Governance Systems. *Journal of Theoretical and Applied Econometrics*, *3*(1), 1-24.

OECD. (2022). *Global plastics outlook: Policy scenarios to 2060*. OECD Publishing. https://doi.org/10.1787/aa1edf33-en

Our World in Data. (2024). *Plastic pollution*. Our World in Data.

Pakistan Environmental Protection Agency. (2024). EPA seals unregistered plastic factories in Islamabad during crackdown on illegal operations (news release). *Government of Pakistan*. https://environment.gov.pk/latestnews

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Pakistan Environmental Protection Agency. (2024, April 30). Pakistan generates 3.3 million tons of plastic waste annually. Ministry of Climate Change and Environmental Coordination, Government of Pakistan.

Promalessy, R., & Handriana, T. (2024). How does greenwashing affect green word of mouth through green skepticism? Empirical research for fast fashion business. *Cogent Business & Management, 11*(1), 2389467. https://doi.org/10.1080/23311975.2024.2389467

Qayyum, A., Jamil, R. A., & Sehar, A. (2023). Impact of green marketing, greenwashing and green confusion on green brand equity. *Spanish Journal of Marketing – ESIC, 27*(3), 286–305. https://doi.org/10.1108/SJME-03-2022-0032

Rahman, A., & Sultana, S. (2023). Real-Time Threat Intelligence Correlation and Triage for Reducing Security Analyst Burnout. *Journal of Engineering and Computational Intelligence Review*, *1*(1), 64-86.

Rahman, A., Sultana, S., & Lima, R. J. (2026). Strategic Framework for Enterprise Cybersecurity Management: Integrating Intelligent Anomaly Detection for Proactive Threat Mitigation. *Journal of Computer Science and Technology Studies*, *8*(4), 58-70.

Rahman, A., Sultana, S., Twaha, U., & Rowshon, M. (2026). AI-Enhanced Web Application Firewalls for Protecting United States Critical Infrastructure Against Zero-Day Exploits. *Scientia. Technology, Science and Society*, *3*(2), 11-32.

Rahman, S. ur, Nguyen-Viet, B., Bhatti, W. A., & Salo, J. (2025). Greenwashing vs green branding: The role of non-deception and brand nature experiences in green brand trust formation. *Asia-Pacific Journal of Business Administration*, 1–23. https://doi.org/10.1108/APJBA-06-2024-0336

Rasheed, N., Sabir, R. I., Mahmood, H., Rauf, A., Ibrahim, A. M., & Naseem, W. (2024). Impact of pro-environmental values on sustainable green apparel buying behavior in Pakistan. *Cleaner and Responsible Consumption, 12*, 100180. https://doi.org/10.1016/j.clrc.2024.100180

Rasul, I., Akter, T., Akter, S., Eshra, S. A., & Hossain, A. (2025). AI-Driven Business Analytics for Product Development: A Survey of Techniques and Outcomes in the Tech Industry. *Frontline Marketing. Management and Economics Journal*, *5*(01), 16-38.

Reuters. (2025). EU halts talks to fight greenwashing on product labels (June 23, 2025). *Reuters*.

Roemer, E., Schuberth, F., & Henseler, J. (2021). HTMT2—An improved criterion for assessing discriminant validity in structural equation modeling. *Industrial Management & Data Systems, 121*(12), 2637–2650. https://doi.org/10.1108/IMDS-02-2021-0082

Volume. 5 Issue No. 2 (2026)
Online ISSN: 3006-2047
Print ISSN: 3006-2039

Sajid, M., Zakkariya, K. A., Suki, N. M., & Islam, J. U. (2024). When going green goes wrong: The effects of greenwashing on brand avoidance and negative word-of-mouth. *Journal of Retailing and Consumer Services, 79*, 103773. https://doi.org/10.1016/j.jretconser.2024.103773

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). Research methods for business students (8th ed.). *Pearson*.

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2023). Research methods for business students (9th ed.). *Pearson*.

Simon, H. A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics, 69*(1), 99–118. https://doi.org/10.2307/1884852

Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics, 87*(3), 355–374. https://doi.org/10.2307/1882010

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics, 87*(3), 355–374. https://doi.org/10.2307/1882010

Suphasomboon, S., & Vassanadumrongdee, S. (2025). The effects of perceived greenwashing on brand trust and brand attachment in the digital era: The moderating role of environmental values. *Journal of Environmental Management, 373*, 123526. https://doi.org/10.1016/j.jenvman.2024.123526

Tu, J.-C., Cui, Y., Liu, L., & Yang, C. (2024). Perceived greenwashing and its impact on the green image of brands. *Sustainability, 16*(20), 9009. https://doi.org/10.3390/su16209009

Twaha, U. (2024). Mitigating Financial Waste in the US Healthcare System: An AI-Driven Framework for Real-Time Fraud Detection in Medicare and Medicaid Claims. *Journal of Engineering and Computational Intelligence Review*, *2*(2), 71-81.

UNCTAD. (2025). *A micro-sectoral study on plastics in Pakistan: Overview of the PET bottle value chain and recommendations*. United Nations Conference on Trade and Development.

United Nations Conference on Trade and Development (UNCTAD). (2024). A road map for sustainable management of plastic waste in Pakistan (micro-sectoral study). *UNCTAD*. https://unctad.org/publication/road-map-sustainable-management-plastic-waste-pakistan

Valero-Gil, J., Suárez-Perales, I., & Ferrón-Vílchez, V. (2024). Would you date a liar? The impact of greenwashing on B2B relationships under the managerial trust view. *BRQ Business Research Quarterly*. Advance online publication. https://doi.org/10.1177/23409444241250360