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Scale Development Study on the Problems Faced by SMEs in the Green Marketing Implementation Process

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Abstract

The escalating severity of global environmental issues has rendered green marketing a strategic imperative for businesses. For Small and Medium-sized Enterprises (SMEs), however, this transition presents numerous barriers, including financial constraints, a lack of expertise, and technological inadequacies. This study develops and validates a psychometrically sound scale to measure the attitudes of Turkish SMEs concerning the problems they face during the implementation of green marketing practices. Using descriptive and exploratory research design, data were collected from 387 managers in the Ankara Ostim Organized Industrial Zone. Construct validity was established through Exploratory and Confirmatory Factor Analyses (EFA/CFA), resulting in the 11-item Green Marketing Problems (GMP) Scale. The scale exhibits a two-factor structure with strong psychometric properties (χ^2/df=2.800, CFI=.965, RMSEA=.068). The first factor, "Perceived Consumer Barriers" (5 items), addresses issues such as insufficient customer awareness and the price perception of green products. The second factor, "Operational and Competitive Inadequacies" (6 items), covers challenges like difficulties in reverse logistics and competition with larger corporations. The study contributes by conceptualizing these barriers not as isolated problems, but as a systemic vicious cycle that fosters strategic inertia. In providing a standardized instrument to empirically measure these challenges, the research addresses a methodological gap in the existing literature.

Keywords: Green Marketing, SMEs, Green Marketing Problems, Scale Development

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1. Introduction

The escalating severity of global environmental issues and rising expectations for corporate sustainability have established green marketing as a strategic imperative for businesses. This approach, which integrates principles of environmental responsibility into the marketing mix, not only enhances corporate reputation but also plays a vital role in achieving a sustainable competitive advantage and strengthening long-term market positioning (Mahmoud, 2018; Agarwal & Choudhary, 2021). This global trend has particularly intensified the focus on Small and Medium-sized Enterprises (SMEs) in Turkey, which are increasingly encouraged to adopt such practices. However, the transition for SMEs is frequently fraught with significant barriers, as highlighted in the literature. Existing research, primarily employing qualitative and descriptive methods, has successfully identified common challenges, including financial constraints, a lack of expertise, technological inadequacies, and weak supply chain integration (Revell & Rutherfoord, 2003; Rizos et al., 2017). While these studies provide a valuable foundation, a notable gap remains.

Despite this substantial body of work, there is a significant methodological and theoretical lacuna in the literature: the absence of a standardized, valid, and reliable measurement instrument to systematically quantify these barriers and examine the underlying psychometric structure of SME managers' attitudes toward them. While the literature has effectively catalogued "what" problems SMEs encounter in green marketing, it lacks a validated measurement instrument to assess both the magnitude and the underlying dimensional structure of SME managers' perceptions. Addressing this gap, the present research aims to develop and validate a psychometrically sound scale to measure the attitudes of Turkish SMEs concerning the problems they face during the implementation of green marketing practices. It is anticipated that this newly developed scale (Green Marketing Problem - (GMP scale)) will not only provide the literature with a novel measurement tool but will also contribute to a better understanding of the green transformation process for SMEs.

2. Literature Review

Green Marketing Strategies

Sustainability and marketing are increasingly viewed as strategically complementary disciplines. Green marketing is defined as a strategic approach that enables firms to achieve tangible outcomes, such as enhanced reputation, cost optimization, and access to new markets, by integrating environmental commitments into their marketing mix (Martin & Schouten, 2012; Diez-Martin et al., 2019). This involves a range of practices, from innovative packaging and lean production to green supply chain management and the use of environmental certifications (Norman & MacDonald, 2004; Cronin et al., 2011; Sarmad & Ali, 2022). However, a critical examination of the literature reveals that the benefits and

applicability of these strategies are not uniform; instead, they are subject to significant contextual factors, most notably firm size and the inherent paradoxes within consumer markets.

A central debate in the literature revolves around the financial impact of green marketing. While numerous studies posit a positive long-term relationship between environmental performance and financial performance through cost savings and enhanced brand equity (Chen et al., 2006), this connection is far from certain, particularly for SMEs. The high initial investment costs for green technologies and processes, coupled with an often-unclear return on investment, create a significant barrier that can negatively impact short-term profitability (Demir et al., 2025; TURKONFED, 2025). This strategic dilemma is compounded by the well-documented "attitude-behavior gap" in consumer markets. Although surveys indicate a rising consumer preference for sustainable products, actual purchasing behavior often fails to align with these stated intentions, a phenomenon known as the "green gap" (Carrington et al., 2010; Koç, 2023). This inconsistency creates substantial uncertainty for firms, especially for SMEs, which lack the market power and financial cushion of larger corporations to absorb the risks of uncertain demand.

Furthermore, the implementation of green marketing strategies differs fundamentally between large corporations and SMEs. Large firms typically leverage dedicated resources, extensive supply chains, and formal management systems to address regulatory pressures and manage corporate reputation on a broad scale. For them, green marketing is often an extension of their corporate social responsibility framework. In contrast, SMEs operate under severe resource constraints, including limited access to finance, technology, and specialized expertise (TURKONFED, 2025). Consequently, their adoption of green marketing is often driven by the personal values of the owner-manager and the pursuit of a competitive niche, rather than large-scale institutional pressures (Mesmer-Magnus et al., 2013). This distinction is critical: for SMEs, green marketing is less about conforming to global ESG standards and more about strategic differentiation and survival. Therefore, simply scaling down the green marketing models designed for large corporations is insufficient; a nuanced understanding of the unique challenges and drivers pertinent to SMEs is essential for both theory and practice.

Drivers of Green Marketing Adoption

A multidimensional set of factors, comprising both internal motivations and external pressures, drives the adoption of green marketing strategies by businesses. In addition to proactive drivers such as rising consumer demand, a sense of social responsibility, and the pursuit of competitive advantage, firms are also prompted to act by reactive factors like legal regulations, competitive pressure, the influence of non-governmental organizations, and cost optimization. In the literature, these drivers are generally categorized under the following headings: Market Opportunities, Social Responsibility, Legal and Regulatory Pressures, Consumer

Demands, Competitive Dynamics, NGO Pressure, and Cost-Profit Orientation (Mesmer-Magnus et al., 2013; Barrow, 2024).

Barriers and Challenges in Green Marketing Implementation

Although SMEs hold significant potential in the green transformation process, the literature consistently highlights that they face structural barriers such as financial constraints, a shortage of qualified human resources, and insufficient information (TURKONFED, 2025). Comprehensive literature reviews have effectively catalogued these challenges. For instance, Dangelico and Vocalelli (2017), in their systematic review, categorize the primary impediments under themes like "Cost and Pricing," "Consumer-Related Barriers," and "Trust Issues," providing a robust conceptual map of what the problems are. Similarly, numerous qualitative and descriptive studies have identified these barriers through case studies and surveys, offering rich contextual insights but stopping short of psychometric measurement (e.g., Mendleson & Polonsky, 1995; Oktaysoy et al., 2025). This body of work, while valuable, primarily identifies and describes the barriers rather than systematically measuring the attitudes of SME managers towards them.

This descriptive focus reveals a significant methodological gap when contrasted with other areas within green marketing research. The field has seen considerable progress in developing and validating psychometrically sound scales for various constructs, such as "Green Marketing Orientation" (Papadas et al., 2017) and the overall "Green Marketing" construct (Vilkaite-Vaitone et al., 2022). This methodological rigor, however, has not been extended to the study of the barriers themselves. The lack of a validated measurement tool prevents researchers from systematically assessing the magnitude of these perceived barriers and understanding their underlying dimensional structure. Consequently, it remains difficult to conduct large-scale, comparative quantitative analyses on the challenges SMEs face. This "methodological asymmetry" leaves a critical gap in the literature, which this study aims to fill by developing a dedicated instrument to measure SME managers' perceptions of the problems in green marketing implementation. Firms adopting green marketing strategies often confront various challenges stemming from both consumer perceptions and internal factors as they strive for market leadership. The literature generally classifies these issues as follows (Mendleson & Polonsky, 1995):

- Consumer-Related Barriers and Perception Issues: The complex nature of green products and the proliferation of environmental messages can create confusion and scepticism among consumers. A significant factor hindering consumer acceptance is the perception that products made from recycled materials are of lower quality. Furthermore, consumer pressure that is not aligned with scientific facts can push firms toward suboptimal decisions. A case in point is the switch from plastic to paper packaging driven by consumer demand, despite the former having a lower environmental impact in some contexts (Polonsky, 1994).

- The complexity of consumer behavior provides a deeper context for the barriers SMEs perceive. The positive outcomes of green marketing are not automatic; they are contingent upon fostering consumer satisfaction, which in turn drives loyalty and purchase intentions. Research by Irshad et al. (2024) demonstrates that Corporate Social Responsibility (CSR) and service quality are critical antecedents of customer satisfaction. For SMEs, this implies that simply offering a green product is insufficient; the initiative must be "implemented intelligently to meet its objectives" and be supported by high service standards to translate into positive consumer sentiment (Irshad et al., 2024). This challenge is amplified by the psychological drivers of green consumption. Ahmad et al. (2023) confirm that both CSR and green consumption behavior positively influence consumer satisfaction, which subsequently predicts loyalty. Crucially, their study highlights that consumers' underlying ethical beliefs-specifically, idealism and relativism-are significant predictors of their engagement in green consumption. This suggests that the barriers SMEs face are not merely related to price or lack of information but are deeply rooted in the diverse ethical frameworks of consumers (Ahmad et al., 2023). Consequently, SMEs' inability to effectively communicate their CSR initiatives or align with these complex consumer values exacerbates the "Perceived Consumer Barriers" and reinforces the systemic cycle of strategic inertia that this study investigates.
- Greenwashing and the Trust Deficit: When firms fail to substantiate their environmental claims with concrete evidence, it can lead to perceptions of "greenwashing," severely damaging trust in both the specific brands and green products in general (Mahmood et al., 2024). To prevent this, marketing claims must be clear, verifiable, and free from exaggeration (Polonsky, 1994).
- Cost Perception and Investment Barriers: The tendency of firms to overestimate the costs of green transformation poses a significant obstacle to necessary investments (Gao & Ma, 2024; Demir et al., 2025). Genuine sustainability often requires initial investments in technology and process improvements, creating a cost-oriented paradox (Jain & Kaur, 2004).
- Legal and Regulatory Burdens: The additional costs and bureaucratic processes associated with meeting environmental standards and legal regulations also present a major challenge for businesses (Anwar et al., 2024).

Dangelico and Vocalelli (2017) summarize the primary challenges in implementing green marketing as follows:

- Cost and Pricing: The development of green products, which necessitates the use of renewable and recyclable materials and high R&D investments, often increases the final product price (Agrawal et al., 2024).
- Consumer-Related Barriers: A significant portion of consumers lacks sufficient knowledge about green products, is unwilling to pay a premium for them, and requires education on the benefits of green marketing (Oktaysoy et al., 2025).

- Trust Issues: Misleading advertising and unproven environmental claims in the market create a general sense of distrust among consumers, undermining green marketing efforts (Marcatajo, 2022).

Despite these challenges, growing awareness of global issues like climate change is making green marketing a strategic imperative. By integrating their environmental responsibility commitments with marketing communications, businesses are strengthening their brand image and increasing consumer loyalty, which serves as a powerful motivation for advancing the green transition (Koç, 2023; Abbas, 2024).

3. Methodology

This study was designed using a descriptive and exploratory research approach to portray the current state of green marketing among SMEs in the Ankara Ostim Organized Industrial Zone (OIZ). Given the nascent stage of research on the problems faced by SMEs in green marketing, an exploratory design was deemed most appropriate. This approach is crucial for delving into under-researched areas, identifying key variables, and laying the groundwork for future hypothesis-testing (Burns & Bush, 2005). The descriptive component aims to present the existing situation as it is, without external intervention (Sonmez & Alacapinar, 2013), which aligns with our objective of developing a scale that reflects managers' current perceptions.

The sampling strategy was purposively designed to align with these exploratory objectives. The universe of the study comprises over 6,500 enterprises, a population for which a comprehensive and accessible sampling frame is unavailable, making probabilistic sampling methods impractical. Therefore, a non-probabilistic, purposive sampling strategy was employed, targeting managers and officials at industry-specific events and fairs within the OIZ. This strategy was chosen for its pragmatic value in accessing a concentrated pool of relevant and knowledgeable respondents who are directly involved in the strategic and operational decisions of their firms (Hair et al., 2014). While this approach does not ensure statistical representativeness of the entire OIZ population, it is highly effective for the exploratory purpose of scale development, where the primary goal is to capture the rich diversity of perceptions and challenges from the most informed segment of the target population. This trade-off is explicitly acknowledged as a limitation of the study in the relevant section. The foundation of the research was established through a comprehensive literature review and informal interviews with field experts to generate the initial item pool for the scale.

The universe for this study comprises managers and officials from the more than 6,500 enterprises operating across 17 different sectors within the Ankara Ostim Organized Industrial Zone (OIZ) (OSTİM, 2025a). The selection of Ostim OIZ as the research setting was a deliberate and strategic choice. As one of Turkey's largest and most established industrial zones, Ostim hosts a diverse and dynamic ecosystem of SMEs that mirrors the broader Turkish industrial landscape. Crucially, its specialization in strategic sectors like defense, aviation, and

machinery, which face increasing pressure to adopt sustainable practices, provides a particularly rich context for exploring the challenges of green marketing implementation. This relevance is further amplified by Ostim OIZ's proactive institutional stance on sustainability. Through its "Green Transformation and Sustainability Office," and with support from the World Bank, the zone actively implements energy-efficiency and digitalization projects, positioning itself as a pioneer in Turkey's green transition (OSTİM, 2025a, 2025b). This institutional commitment ensures that the concept of green marketing is not only relevant but is an active area of consideration and struggle for the firms within it, making it an ideal setting to capture nuanced and informed perceptions from managers.

While this specific setting provides a robust foundation for an exploratory-scale development study, the issue of generalizability must be addressed with caution. The findings are primarily contextualized within a well-developed industrial zone with a high degree of sustainability consciousness. Therefore, although the developed scale is intended for broader application, the specific prevalence and intensity of the perceived problems may differ for SMEs in less-developed regions, in other sectors (e.g., services or agriculture), or in countries with different levels of environmental regulation and consumer awareness. This contextual specificity is acknowledged as a limitation of the study.

The survey was conducted between 22 February and 8 July 2024 with the permission and support of Ostim OIZ Directorate and Ostim İŞKUR Service Center. In total, 387 questionnaires were collected: 330 face-to-face, 30 online, and 27 through drop-and-collect. Face-to-face surveys allowed clarification of questions and deeper insights. Participation was particularly high during events such as the İş Pozitif Women's Employment Fair, OSTIMTECH Promotion Days, Prosumer Renewable Energy e-Mobility Charging Fair, and the Green Transformation in Industry Summit.

A sufficient sample size was achieved by including a total of 387 participants from 360 distinct enterprises, a figure determined by considering sample size recommendations from the relevant literature (Bougie & Sekaran, 2019). Primary data were collected using a structured, four-part questionnaire finalized after expert review. The first section of the survey comprised 34 items on a 5-point Likert scale designed to measure green marketing problems, while the other sections gathered general information about the firms and participants using nominal and ordinal scales. Following the acquisition of necessary institutional permissions, the fieldwork was conducted between February 22 and July 8, 2024, utilizing face-to-face interviews, online forms, and the drop-off and pick-up method. A total of 387 valid questionnaires were obtained. The predominance of the face-to-face method facilitated the collection of more in-depth information. During the data collection process, it was observed that participation rates were notably higher during industry-specific trade fairs and promotional events where firm officials were heavily concentrated. This is likely attributable to the officials' greater availability and willingness to allocate time for the survey in such settings.

In contrast, response rates were comparatively lower during direct visits to company premises. The data collected were analyzed using SPSS 24 and AMOS 24 software. To develop the scale, Cronbach's Alpha analysis was conducted to measure internal consistency. To examine construct validity, an Exploratory Factor Analysis (EFA) was performed, followed by a Confirmatory Factor Analysis (CFA). In the reduction of the items in the scale, firstly, expert opinions were taken and some questions were removed. The remaining questions were pre-tested and the questions with factor loadings below 0.50 were removed from the scale in accordance with EFA and CFA analyses.

Addressing Social Desirability Bias

In survey-based research involving socially valued topics such as green marketing, a potential methodological risk is the tendency of respondents to provide socially acceptable answers rather than reflecting their true attitudes (i.e., social desirability bias - SDB). This bias can threaten the validity of the data, particularly when attitudes and behaviors are directly questioned (Larson, 2019). To minimize this potential risk, the scale in this study was intentionally designed not to measure the "success" or "support of firms for green marketing, but rather the "problems" and "operational challenges" they encounter in the process. This problem-focused approach aims to encourage more candid and realistic responses by reducing the pressure on participants to project a socially desirable image. Furthermore, it has been argued that the risk of SDB is more significantly influenced by the specific social perception of the behavior in question rather than by the general disposition of individuals (Zhu et al., 2024). Consequently, behavior/situation-specific and operational items, such as "difficulties in returning used packaging" or "inability to compete with large firms," are more resistant to SDB than items measuring general and abstract "pro-environmental" attitudes. The assurance of respondent anonymity during data collection, combined with the wide distribution of mean scores and high standard deviation values observed in the data (see Table 8), indicates that the impact of SDB has been substantially controlled for in this study, supporting the high validity of the collected data.

Analytical Approach and Control for Common Method Bias

In this study, Covariance-Based Structural Equation Modeling (CB-SEM) was chosen as the analytical approach to test the theoretical structure of the developed scale against the empirical data. As the primary objective of the research is to validate the reliability and validity of the two-factor structure derived from the literature, the superiority of CB-SEM in theory testing and model fit assessment provided the main rationale for this choice. Since the data for all variables were collected from the same respondents using a single questionnaire, there is a potential risk of Common Method Bias (CMB). CMB can artificially inflate or deflate the relationships between the measured constructs, thereby threatening the validity of the findings (Podsakoff et al., 2003). To address this risk, both ex-ante (procedural) and ex-post (statistical) control methods were implemented.

Prior to data collection, procedural remedies were employed by randomizing the order of the survey items and assuring the anonymity of the participants. Following data collection, an ex-post statistical control was implemented using Harman's single-factor test to assess the potential impact of Common Method Bias (CMB). This widely used diagnostic tool involves subjecting all scale items from the study to an unrotated Exploratory Factor Analysis (EFA) to determine if a single factor accounts for the majority of the covariance among the measures (Podsakoff et al., 2003). The underlying logic is that if CMB is a serious issue, a single latent factor will emerge from the analysis, explaining more than 50% of the total variance. The results of our analysis indicated that the first extracted factor accounted for only 37.68% of the total variance. As this value is substantially below the critical threshold of 50%, it provides strong statistical evidence that a single methodological factor does not dominate the dataset. This finding, combined with our procedural remedies, confirms that Common Method Bias does not pose a significant threat to the validity of our research results.

The adequacy of the sample size is a critical prerequisite for the validity of factor analysis and structural equation modeling. The present study achieved a sample size of 387 participants, which is considered robust for the intended statistical analyses based on multiple established criteria. Firstly, general rules of thumb for factor analysis suggest that a sample size over 300 is considered "good" to "very good" for obtaining stable factor solutions (Comrey & Lee, 1992). More specifically for Confirmatory Factor Analysis (CFA), Hair et al. (2014) recommend a sample size of at least 200 to ensure reliable parameter estimates, a threshold our sample comfortably surpasses. Secondly, the subject-to-item ratio provides another justification. A commonly accepted minimum ratio is 10 participants per scale item to ensure factor stability (Nunnally & Bernstein, 1994). Given that the final validated Green Marketing Problems (GMP) scale consists of 11 items, a minimum sample of 110 respondents would be required. Our sample of 387 participants for the 11-item scale provides a ratio of approximately 35 participants for each item. This ratio substantially exceeds the minimum thresholds recommended in the literature, ensuring the reliability and stability of the factor structure. Therefore, the collected sample size is deemed more than sufficient to conduct both Exploratory and Confirmatory Factor Analyses with a high degree of confidence.

4. Scale Development Study on Green Marketing Problems

The scale development process in this study was structured according to the ten-step methodology proposed by Carpenter (Carpenter, 2018). This procedure involved a two-phase analysis: initially, a pre-test (pilot study) was conducted with a group of 159 participants to examine the emergent factor structure. Subsequently, to test the consistency and generalizability of the findings, the analyses were replicated on a larger sample of 387 participants. Carpenter's (Carpenter, 2018) methodology was chosen for its structured, comprehensive, and reporting-oriented practical framework, which distinguishes it from other approaches. The

effectiveness of this approach in enhancing the scientific value and quality of scale development studies is well-recognized, as it has been adopted and implemented by numerous researchers in the field (Kleindorfer et al., 2005; Abeele et al., 2020; Soulard et al., 2021; Önem & Selvi, 2024).

Study 1: Pre-Test Analysis

Stages 1 and 2: Item Pool Generation and Expert Review

The initial steps in the scale development process involved a systematic series of procedures. These included generating an item pool by establishing a conceptual framework through a comprehensive literature review and qualitative research, submitting this pool for expert review to ensure content validity, and finalizing the overall structure and model of the questionnaire.

Table 1. Item pool for the GMP scale - expert evaluation

Item No	**Statements**	**Expert Opinions**		
		1= " Number of experts who said " Not Necessary	**2= " number of experts who said " should be corrected."**	**3= The number of experts who rated the item as " essential."**
1	Insufficient customer awareness	0	1	9
2	Lack of awareness of environmental impacts	0	1	9
3	Reluctance among consumers to protect the environment	0	1	9
4	Consumers find green products too expensive	0	0	10
5	Consumers do not want to buy more expensive green products	0	0	10
6	The cost of returnable packaging materials is competitive.	0	1	9
7	We do not have difficulty in sourcing local materials	2	3	5
8	There is continuity in the supply of recyclable materials.	0	1	9
9	We easily find environmentally friendly vehicles for transportation	0	0	10
10	We have an electrically powered transportation fleet.	0	1	9
11	We are able to monitor emissions during the shipment process	0	1	9
12	We can easily find green suppliers.	0	1	9
13	We cooperate with environmentally friendly partners.	3	0	7
14	We have personnel specialized in sustainability.	0	0	10
15	Our sales force is aligned with the company's environmental goals	0	1	9

16	We fully understand customer requirements regarding environmental issues.	0	1	9
17	The expectations of environmentalist consumer groups positively affect our marketing process.	0	1	9
18	We do not receive product returns on the grounds that they are not environmentally friendly.	0	1	9
19	We do not receive complaints against our products on the grounds that they are not environmentally friendly.	0	1	9
20	Consumers' expectations from green products are reasonable	2	3	5
21	We measure the carbon footprint in our logistics processes	0	1	9
22	The energy we use in our distribution process is renewable.	0	1	9
23	Our reverse logistics practices are strong.	0	1	9
24	We have problems in returning used packaging to suppliers	0	1	9
25	We are not very successful in the resale of used parts	0	1	9
26	We have a few green-collar employees in our company.	6	1	3
27	We cannot compete because green production methods increase product costs	0	1	9
28	The process of obtaining green standards/certificates is difficult for us	0	1	9
29	We cannot compete against large companies that prioritize green marketing.	0	1	9
30	We easily adapt to customer expectations regarding green products	0	1	9
31	We easily identify green needs in the market.	5	2	3
32	We use ecological arguments sufficiently in our promotions.	0	0	10
33	Our environmental standards/certifications are sufficient.	0	1	9
34	The materials we use in packaging are environmentally friendly.	0	1	9
35	We have sufficient recyclable packaging in our warehouses.	0	0	10
36	We adequately announce our environmental initiatives to our stakeholders.	0	1	9
37	Green packaging activities optimize our costs.	0	0	10
38	We can reduce our costs through green production.	0	0	10
39	Our success in reverse logistics practices is at the desired level	4	0	6
40	We cannot recall products with quality problems	0	1	9

Source: Created by the authors.

In this context, the items in the generated pool were evaluated by a panel of 10 experts. All panelists were academics specializing in marketing (6 male, 4 female), each with a minimum of ten years of professional experience. A summary of the experts' responses is provided in Table 1; only items unanimously rated as "essential" by all experts were retained for the final scale.

Stage 3: Calculation of the Content Validity Ratio (CVR)

In the third stage of the scale development process, each item in the pool was evaluated for content validity by 10 subject-matter experts. The Content Validity Ratio (CVR) for each item was calculated using the formula developed by Lawshe (1975):

$$CVR = \frac{Ne}{(N/2)} - 1 \quad (1)$$

Where:

Ne: "The number of experts who rated the item as "essential."

N: The total number of experts.

To determine the statistical significance of the CVR values, the critical values provided by Ayre and Scally (2014) were referenced. For a panel of 10 experts (N=10), an item must be rated as "essential" by at least 9 experts and achieve a minimum critical CVR value of 0.80 to be considered statistically significant ($p < .05$). Based on this criterion, a total of 34 items that met or exceeded this threshold were retained in the item pool for the subsequent stage.

The average CVR of these 34 retained items yields the Content Validity Index (CVI), which indicates the overall content validity of the scale. The calculated CVI for the scale is 0.85. Since the scale's CVI (0.85) is greater than the critical CVR value (0.80), the content validity of the developed scale is confirmed as statistically significant and high. Following this process, items that did not meet the CVR threshold, such as items 7, 13, 20, 26, 31, and 39, which were rated as "not essential" or "needs correction" by a majority of the experts, were eliminated from the scale due to their low CVR scores. The remaining 34 items constituted the final version of the questionnaire used in the field survey.

Step 1: Finalizing the Scale

After calculating the CVR and CVI for the items in the pool, the final version of the scale was established, and the items were renumbered from 1 to 34.

Steps 2 and 3: Sample Selection and Pre-testing (n=159)

In the pre-test, 66.67% (n=106) were male, and 33.33% (n=53) were female. More than half of the participants were 40 years old or younger, and the majority had a bachelor's degree. Normality analysis was performed for all data except demographic variables.

Table 2. Normality analysis

Scale	Kolmogorov-Smirnov			Central Tendency Measurements			
	Statistic	df	Sig.	Mean	Median	Skewness	Kurtosis
GMP	0.051	159	0.200	3.455	3.455	-0.194	0.158

Source: Created by the authors.

According to Table 2, the skewness and kurtosis values fall within the range of ±1.96. Therefore, it can be concluded that the sample data is normally distributed (Hair et al., 2014).

Step 4. Establishing the Factor Structure of the Scale

In this stage, the construct validity of the scale was examined by first assessing the inter-item correlation matrix, which revealed no unrelated items. Subsequently, an EFA was performed to test the suitability of the data for factorization.

The established criteria for the analysis were a Bartlett's test of sphericity value less than .05, a KMO value greater than .60, and factor loadings exceeding .50 (Hair et al., 2014). As noted by Cudeck and O'Dell (1994), EFA is a widely used technique in scale development, refinement, and evaluation. This analysis is instrumental in reducing the dataset to a more manageable size while uncovering latent relationships among items. Furthermore, Luo et al. (2019) emphasize that the flexibility afforded by EFA can provide insights that enhance the understanding of underlying latent structures, thereby enriching the inferences drawn from the analysis. The results of the EFA and Parallel Analysis (PA) conducted in this study are detailed in Table 3.

The analyses indicate that the developed scale meets acceptable statistical thresholds. The Kaiser-Meyer-Olkin (KMO) value was calculated as 0.832 (KMO>0.60), and the significance level for Bartlett's test of sphericity was 0.000 ($p<0.05$). Furthermore, the Cronbach's Alpha coefficient, indicating the scale's internal consistency, was 0.845, which is above the recommended 0.60 threshold, aligning with criteria found in the literature (Cudeck & O'Dell, 1994; Hair et al., 2014; Luo et al., 2019). However, as highlighted by Carpenter (2018), while these values confirm the data's suitability for factor analysis, an additional verification is necessary to ensure that items are not randomly distributed across sub-dimensions. Consequently, as an alternative to the commonly used Kaiser-Guttman rule, which retains factors with eigenvalues greater than 1, the PA technique proposed by Horn (1965) was also employed to determine the number of factors to retain.

Table 3. EFA and PA

Statements	**Factor Load Value (SPSS)**	**Cronbach Alfa (α)**	**PA Results** (Ncases: 159; Nvar: 11; Ndataset:100; Percent: 95; Brian Oc)		
			Raw Data	**Means**	**Percently**
Dimension 1					
% of Variance: 34.253; Eigen-value: 4.344			4.344	1.952	2.078
Problem 1. Insufficient customer awareness	0.853				
Problem 2. Lack of awareness of environmental impacts	0.908				
Problem 3. Reluctance among consumers to protect the environment	0.825	α= 0.875			
Problem 4. Consumers find green products too expensive	0.622				
Problem 5. Consumers do not want to buy more expensive green products	0.568				
Dimension 2			**Raw Data**	**Means**	**Percently**
% of Variance: 23.112; Eigen-value: 2.802			2.802	1.816	1.907
Problem 21. We have problems in returning used packaging to suppliers	0.611				
Problem 22. We are not very successful in the resale of used parts	0.724				
Problem 23. We cannot compete because green production methods increase product costs	0.659	α= 0.880			
Problem 24. The process of obtaining green standards/ certificates is difficult for us	0.788				
Problem 25. We cannot compete against large companies that prioritize green marketing.	0.807				
Problem 34. We cannot recall products with quality problems	0.835				
Extraction Method: Maximum Likelihood (ML)					
Rotation Method: Direct Oblimin					
KMO: 0.832;					
Bartlett's sphericity test; (χ2=940.931; df=55; p=.000)					

Source: Created by the authors.

The significance of the resulting factor structure was tested using the method proposed by Horn (1965). This method involves comparing the factor analysis results with those obtained from a random dataset (Weng & Cheng, 2005). In this study, the factor analysis results were evaluated through this comparison, and the extracted factors were deemed significant. However, additional analyses were

conducted to gain more insight into how well the factors represent the scale's sub-dimensions. Although it has critical aspects, an analysis based on the Kaiser-Guttman rule was conducted to examine the distribution of items on the scale, with the results presented in Table 4.

Table 4. Unidimensionality Analysis (Kaiser-Guttman Criterion)

Factors	No. of items	1. Eigenvalue	2. Eigenvalue	3. Eigenvalue	Total Variance
GMP	11	4.344	2.802	0.891	57.600

Source: Created by the authors.

The EFA process, as detailed in steps 5 through 9 of Carpenter's (2018) methodology, was meticulously applied in this study. The analyses were conducted using the Maximum Likelihood estimation method to extract the factor structure. A minimum factor loading of 0.50 was set as the criterion for item retention, and the Direct Oblimin oblique rotation method was chosen to achieve a more interpretable factor solution. To finalize the scale structure, the EFA and PA procedures were iteratively repeated five times in conjunction with CFA. As a result of these iterative analyses, items with factor loadings below 0.50 (23 items between 6-23 and 30-34 in total) were removed from the scale to improve model fit. The removal of items with factor loadings below the conventional threshold of 0.50 is a standard procedure aimed at enhancing the psychometric integrity of a scale (Hair et al., 2014). However, this iterative process was not merely statistical but was also guided by theoretical considerations to ensure the scale's construct validity was not solely data-driven. A post-hoc conceptual review of the removed items confirmed their theoretical misalignment with the emergent two-factor structure of "problems." For instance, several dropped items pertained to marketing tactics (e.g., 'use of ecological arguments in promotions') or positive operational outcomes (e.g., "not receiving complaints"), rather than the underlying barriers that are the core focus of this scale. Other items, such as those related to supplier cooperation or having specialized personnel, were identified as conceptually ambiguous, potentially representing enablers or strategic choices rather than direct problems faced during implementation (see Papadas et al., 2017). Therefore, the item reduction process served a dual purpose: it statistically purified the factor structure while simultaneously sharpening the scale's conceptual focus to precisely measure the perceived problems in green marketing, as intended by the study's theoretical framework.

The primary purpose of this analysis is to identify any non-conforming scale items among the remaining variables. In this regard, items that exhibit a significant correlation of 0.50 or higher with at least one other scale item are considered appropriate for retention.

Table 5. Correlation table

Items	1	2	3	4	5	6	7	8	9	10	11
Problem 1	1										
Problem 2	.790**	1									
Problem 3	.645**	.707**	1								
Problem 4	.470**	.552**	.543**	1							
Problem 5	.450**	.455**	.553**	.674**	1						
Problem 21	0.078	0.122	0.051	0.090	0.146	1					
Problem 22	.182*	0.118	0.134	0.141	.247**	.568**	1				
Problem 23	0.144	.162*	0.114	.159*	0.125	.445**	.582**	1			
Problem 24	0.060	0.088	0.021	.248**	.247**	.513**	.596**	.506**	1		
Problem 25	0.062	0.063	.015	.216**	.208**	.422**	.544**	.523**	.588**	1	
Problem 34	0.112	0.121	0.090	.308**	.290**	.469**	.564**	.541**	.649**	.725**	1

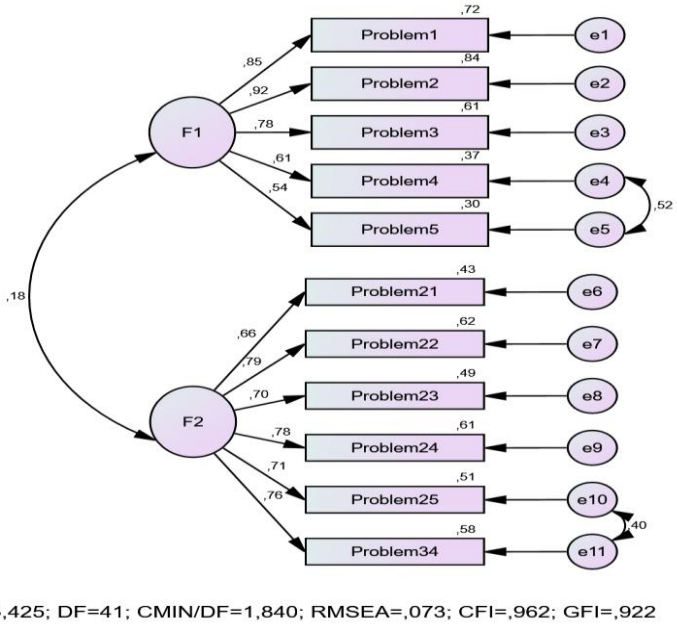
Source: Created by the authors. **Note:** ** $p<0.01$; * $p<0.05$

Step 10: Model Testing with Confirmatory Factor Analysis

CFA is a fundamental method used for the psychometric evaluation of a scale and for empirically testing a predetermined structure; it is also suitable for assessing method effects and factor invariance (Kääriäinen et al., 2011). Its primary distinction from EFA is its theory-driven nature. EFA adopts a data-driven approach to discover latent factors from the relationships among observed variables and can be criticized for not requiring a theoretical hypothesis (Ottem, 2003). In contrast, CFA tests how well a model, which the researcher has constructed based on theoretical grounds, fits the collected data. This theory-based approach makes CFA a more robust method for providing validity evidence compared to EFA (Hair et al., 2014). In this study, CFA was employed to validate the factor structure derived from the EFA, and the resulting model is presented in Figure 1.

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Figure 1. CFA analysis



Source: Created by the authors.

Construct Validity Assessment: To test the proposed two-factor structure and establish the psychometric properties of the GMP scale, a Confirmatory Factor Analysis (CFA) was conducted using AMOS 24 software. The assessment of construct validity involved a comprehensive evaluation of model fit, convergent validity, and discriminant validity, adhering to established methodological standards.

First, the overall model fit was evaluated using a combination of absolute and incremental fit indices. The results indicated an acceptable fit of the two-factor model to the data: the chi-square/degrees of freedom ratio (X^2/df) was 2.800, which is below the recommended maximum of 5. The Root Mean Square Error of Approximation (RMSEA = .068) and the Standardized Root Mean Square Residual (SRMR = .063) were both below the .08 ceiling, providing further evidence of a good fit (Hair et al., 2014). For incremental fit indices, the Comparative Fit Index (CFI = .965) exceeded the stringent >.90 threshold, indicating a strong model fit (Hu & Bentler, 1999). Similarly, the Goodness of Fit Index (GFI = .950) surpassed the >.85 level, which is considered acceptable in applied research, especially when corroborated by other strong fit indices (Schermelleh-Engel et al., 2003).

Second, convergent validity, which confirms that items intended to measure a specific construct are indeed related, was assessed through two primary metrics. The Composite Reliability (CR) values for both factors were well above the 0.70 threshold, indicating high internal consistency (Schermelleh-Engel et al., 2003). More importantly, the Average Variance Extracted (AVE) for both "Perceived Consumer Barriers" (AVE =0.54) and "Operational and Competitive Inadequacies" (AVE = 0.53) surpassed the recommended 0.50 criterion. This demonstrates that

the latent factors explain, on average, more than half of the variance in their respective indicator items, confirming that the variance captured by the constructs is greater than the variance due to measurement error (Fornell & Larcker, 1981).

Finally, discriminant validity was established to ensure that the two factors are statistically distinct constructs. Following the Fornell-Larcker criterion, the square root of the AVE for each construct (0.73 and 0.72, respectively) was compared to the inter-construct correlation coefficient (r = 0.58). As the square root of the AVE for each factor was greater than their shared correlation, this provides strong evidence for discriminant validity, confirming that the two constructs are indeed measuring different underlying phenomena (Fornell & Larcker, 1981). Collectively, these results provide robust support for the two-factor structure and the overall construct validity of the GMP scale.

Table 6. Goodness-of-Fit indices

X^2(df)	p	RMSEA	CFI	GFI	SRMR	AVE	CR
1.840	0.001	0.053	0.962	0.922	0.069	0.536	0.939

Source: Created by the authors.

The measurement model and factor loadings for the analysis are presented in Table 7. According to the results of the measurement model, no item exhibited a factor loading below the 0.50 threshold.

Table 7. Measurement Model

Measurement Model			β1	β2	Ss	t	p	CR	AVE
Prob.1	<---	Prob. pretest	0.849	1.000					
Prob 2	<---	Prob. pretest	0.916	0.983	0.071	13.772	<0,001		
Prob 3	<---	Prob. pretest	0.780	0.866	0.076	11.450	<0,001		
Prob.4	<---	Prob. pretest	0.607	0.691	0.085	8.153	<0,001		
Prob. 5	<---	Prob. pretest	0.544	0.597	0.084	7.128	<0,001		
Prob. 21	<---	Prob. pretest	0.656	1.000				0.552	0.957
Prob. 22	<---	Prob. pretest	0.786	1.200	0.147	8.160	<0,001		
Prob. 23	<---	Prob. pretest	0.701	1.102	0.148	7.470	<0,001		
Prob. 24	<---	Prob. pretest	0.782	1.130	0.139	8.128	<0,001		
Prob. 25	<---	Prob. pretest	0.712	1.053	0.140	7.505	<0,001		
Prob. 34	<---	Prob. pretest	0.765	1.140	0.143	7.961	<0.001		

Source: Created by the authors.

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These analyses confirmed that the GMP scale possesses a two-factor structure comprising 11 items. Scale development literature recommends that to reinforce the validity and reliability of a newly developed instrument, its findings should be tested on a different and larger sample (Kang & Johnson, 2011; Wulani et al., 2014; Whittaker & Worthington, 2016; Friesner et al., 2021). In line with this recommendation, the structural validity of the developed scale is being re-evaluated using data collected from a new sample group of 387 participants.

Study 2: Analysis on a Larger Sample

The two-factor, 11-item scale resulting from the pre-test of the GMP scale was re-administered to a group of 387 individuals. The analyses were again conducted in accordance with the relevant steps outlined in Carpenter's (2018) 10-step methodology. After the pre-test of the GMP scale, a larger sample (387 people) was surveyed again for the items related to the sub-dimensions formed in the scale, and the following striking findings were obtained:

The sample profile reveals a cohort of experienced professionals within established companies. One-third of the surveyed firms have been operating for 10 years or less, while another one-third have been active between 11 and 30 years. Approximately 56.1% of the firms employ 100 or fewer workers. Their main fields of production are concentrated in machinery and spare parts (30.2%), food and packaging (25%), and information/technology industries (24.3%). More than half of the participating firms engage in export activities, and the majority acknowledge the importance of digital marketing, actively utilizing these channels. While most of these firms have embraced digital marketing and recognize its importance, and more than half are engaged in exporting, a significant gap exists in their environmental practices, as most do not utilize any carbon offset systems. This discrepancy is notable, given that a considerable number of firms possess a moderate to high level of awareness regarding the European Union's carbon border adjustment mechanism and anticipate that it will significantly impact their operations. In terms of environmental initiatives, a paradox is observed: while most firms lack reverse logistics systems, over half use "eco-friendly" and "recycling" labels on their products. Looking forward, although most companies anticipate increasing their recruitment for green-related positions, a large portion have not yet obtained ISO 14001 certification.

The results of Table 8 indicate that SMEs encounter a series of interconnected obstacles on their green marketing journey, stemming from both external market dynamics and their own internal deficiencies. From the managers' perspective, the most dominant problems are consumer driven. The perception that consumers find green products to be expensive ($\bar{X}$=3.94) and the general lack of environmental awareness ($\bar{X}$=3.87) place SMEs in a strategic impasse. These external pressures are further exacerbated by the firms' internal and operational weaknesses. Regarding competitive aspects, the mean score for the item 'We cannot compete against large companies that prioritize green marketing' was 3.38. For operational infrastructure, the mean score for 'We have problems in returning used packaging to suppliers' was 3.13.

Table 8. Post-test GMP scale

Sequence no.	GMP Item no		level of agreement					Mean ($\bar{X}$)	S.D.
			1-Strongly disagree	2-Disagree	3-Neither disagree, Neither agree	4-Agree	5-Strongly agree		
1	GMP 1	f	20	40	35	178	114	3.84	1.11
		%	5.2	10.3	9.0	46.0	29.5		
2	GMP 2	f	13	46	28	188	112	3.87	1.06
		%	3.4	11.9	7.2	48.6	28.9		
3	GMP 3	f	12	53	65	175	82	3.67	1.05
		%	3.1	13.7	16.8	45.2	21.2		
4	GMP 4	f	12	33	49	165	128	3.94	1.03
		%	3.1	8.5	12.7	42.6	33.1		
5	GMP 5	f	9	38	45	169	126	3.94	1.02
		%	2.3	9.8	11.6	43.7	32.6		
6	GMP 21	f	41	69	101	150	26	3.13	1.11
		%	10.6	17,8	26.1	38.8	6.7		
7	GMP 22	f	47	67	100	139	34	3.11	1.16
		%	12.1	17.3	25.8	35.9	8.8		
8	GMP 23	f	60	113	79	109	26	2.81	1.19
		%	15.5	29.2	20.4	28.2	6.7		
9	GMP 24	f	34	68	80	169	36	3.27	1.12
		%	8.8	17.6	20.7	43.7	9.3		
10	GMP 25	f	30	66	83	140	68	3.38	1.18
		%	7.8	17.1	21.4	36.2	17.6		
11	GMP 34	f	39	88	72	140	48	3.18	1.20
		%	10.1	22.7	18.6	36.2	12.4		

Source: Created by the authors.

Similarly, the process of obtaining green standards/certificates is perceived as a significant operational barrier ($\bar{X}$=3.27). Issues such as the inability to recall products with quality problems ($\bar{X}$=3.18), difficulties in returning used packaging to suppliers ($\bar{X}$=3.13), and lack of success in the resale of used parts ($\bar{X}$=3.11) further highlight these infrastructural and operational inadequacies. Most notably, SMEs perceive that they cannot compete because green production methods increase product costs ($\bar{X}$=2.81). This finding points to a systemic vicious cycle for SMEs, which are caught between cost, competition, and operational deficiencies. This cycle deters firms from making necessary investments and fosters strategic inertia in their green transformation process.

Table 9. Normality analysis

Scale	Kolmogorov-Smirnov			Central Tendency Measurements			
	Statistic	df	Sig.	Mean	Median	Skewness	Kurtosis
Problem	0,082	387	0.000	3.471	3.545	-0.498	0.383

Source: Created by the authors.

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The skewness and kurtosis coefficients presented in Table 9 fall within the accepted range of ±1.96, indicating that the data meet the assumption of normal distribution (Hair et al., 2014). Based on this finding, an EFA was repeated to confirm the scale's factor structure.

The EFA results demonstrated that the distribution of items under the factors was consistent with the previous analysis. Furthermore, to eliminate the influence of chance in determining the number of factors, the PA technique was employed as an additional verification measure.

Table 10. EFA and PA

Statements	**Factor load value (SPSS)**	**Cronbach Alfa (α)**	**PA Results** (Ncases: 387; Nvar: 11; Ndataset:100; Percent: 95; Brian Oc)		
			Raw Data	**Means**	**Percently**
Dimension 1 % of Variance: 33.631; Eigen-value: 4.296		α= 0.874	4.296	1.281	1.348
Problem 1	0.865				
Problem 2	0.913				
Problem 3	0.768				
Problem 4	0.637				
Problem 5	0.583				
Dimension 2			**Raw Data**	**Means**	**Percently**
% of Variance: 21.862; Eigen-value: 2,682			2.682	1.204	1.252
Problem 21	0.634	α= 0.866			
Problem 22	0.655				
Problem 23	0.605				
Problem 24	0.805				
Problem 25	0.819				
Problem 34	0.775				
Extraction Method: Maximum Likelihood (ML)					
Rotation Method: Direct Oblimin					
KMO: 0.837;					
Bartlett's sphericity test; (χ2=2.163,752; df=55; p=.000)					

Source: Created by the authors.

The analysis results confirm that the psychometric properties of the developed scale meet the criteria established in the literature. The KMO value, indicating the data's suitability for factor analysis, was 0.837, and the significance level for Bartlett's test of sphericity was 0.000. Furthermore, the Cronbach's Alpha coefficients for internal consistency were above 0.60, the AVE for convergent validity was greater than 0.50, and the CR exceeded 0.70, all of which demonstrate that the scale is acceptably valid and reliable (Cudeck & O'Dell, 1994; Hair et al., 2014; Luo et al., 2019). According to the analysis in Table 10, the following model

fit indices are required: $X^2/df < 5$, $p < 0.05$, RMSEA < 0.08, CFI > 0.90, GFI > 0.85, SRMR < 0.08, AVE > 0.50, and CR > 0.70 (Schermelleh-Engel et al., 2003).

Table 11. Goodness-of-Fit indices

X^2(df)	p	RMSEA	CFI	GFI	SRMR	AVE	CR
2.800	0.001	0.068	0.965	0.950	0.063	0.535	0.954

Source: Created by the authors.

Following the increase in sample size, minor fluctuations were observed in some statistical values, with some increasing and others decreasing. Despite these variations, all resulting metrics remained within the accepted reference ranges defined by the literature, confirming the stability of the scale. Although the initial analyses yielded results consistent with the research hypotheses, an additional verification step was undertaken to definitively confirm that the items loaded correctly onto their respective sub-dimensions. Accordingly, a further factor analysis was conducted based on the Kaiser-Guttman criterion. The results of this analysis demonstrated that the scale items clustered under the theoretically predicted factors as expected, thereby strengthening the construct validity of the scale (Hair et al., 2014). Detailed findings from this analysis are presented in Table 12.

Table 12. Unidimensionality Analysis (Kaiser-Guttman Criteria)

Factors	N. of items	1. Eigenvalue	2. Eigenvalue	3. Eigenvalue	Total Variance
GMP	11	4.296	2.682	0.827	55.737

Source: Created by the authors.

Table 13. Correlation table

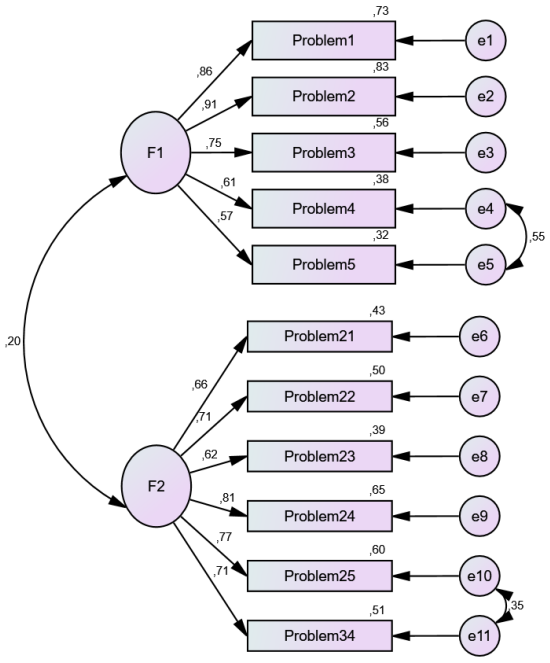
Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Prob. 1	1													
Prob. 2	.787**	1												
Prob. 3	.615**	.682**	1											
Prob.4	.518**	.541**	.507**	1										
Prob. 5	.488**	.490**	.480**	.703**	1									
Prob.21	.113*	.,084	0.036	.119*	.166**	1								
Prob. 22	.178**	.156**	.150**	.177**	.273**	.508**	1							
Prob. 23	.085	0.033	0.084	0.070	0.089	.407**	,530**	1						
Prob. 24	.100*	.106*	0.083	.234**	.275**	.525**	,538**	.473**	1					
Prob. 25	.149**	.155**	0.095	.215**	.289**	.503**	,547**	.447**	.637**	1				
Prob. 34	.123*	.122*	.142**	.219**	.254**	.430**	,435**	.441**	.639**	.707**	1			
Prob.1. factor	.842**	.862**	.806**	.798**	.770**	.126*	,228**	0.088	.193**	.220**	,209**	1		
Prob.2. factor	.161**	.141**	.128*	.223**	.290**	,721**	,766**	.714**	.819**	.830**	,791**	,230**	1	
Prob. Overall	.589**	.586**	.545**	.607**	.638**	,581**	,670**	.554**	.688**	.710**	,677**	,726**	,836**	1

Source: Created by the authors.

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To evaluate the internal consistency of the resulting factor structure, the correlations among the variables were examined, with the results presented in Table 13. The primary objective of this analysis was to identify any items that did not align with the structure due to weak relationships with other variables. In this context, the criterion for an item's retention was a statistically significant correlation coefficient greater than 0.50 with at least one other item in the scale.

Figure 2. CFA analysis



CMIN=114,811; DF=41; CMIN/DF=2,800; RMSEA=,068; CFI=,965; GFI=,950

Source: Created by the authors.

The results of the EFA indicated that the scale possessed the expected psychometric properties. Nevertheless, considering the distinct advantages of CFA, such as its ability to test a theoretical model and provide more robust validity evidence (Hair et al., 2014), it was deemed necessary to apply CFA to confirm the scale structure. A visual representation of the structural model from this analysis is provided in Figure 2.

The final analysis results, presented in Table 14, confirm that no item in the 11-item, two-factor scale structure has a factor loading below 0.50. Achieving meaningful findings in scientific research necessitates the use of valid measurement instruments. However, the quality of measurement is often inadequately detailed in many studies, which typically report little beyond reliability coefficients. It is well-established that while reliability is a necessary precondition for validity, it is not sufficient on its own; measurement errors can artificially inflate reliability while compromising validity (Shevlin et al., 2000). Detecting such complex measurement issues with EFA alone is challenging. Therefore, reporting EFA is most meaningful

when it serves as a precursor to a more robust statistical method like CFA (Cudeck & O'Dell, 1994; Ottem, 2003). Ideally, a scale development study should comprehensively address all methodological procedures and potential sources of error.

Table 14. Measurement model

Measurement Model			**β1**	**β2**	**Ss**	**t**	**p**	**CR**	**AVE**
Prob. 1	<--	Prob.	0.856	1.000					
Prob. 2	<--	Prob.	0.911	1.014	0.048	21,266	<0,001		
Prob. 3	<--	Prob.	0.746	0.822	0.049	16,815	<0,001		
Prob. 4	<--	Prob.	0.613	0.666	0.052	12,896	<0,001		
Prob. 5	<--	Prob.	0.567	0.608	0.052	11,720	<0,001		
Prob.21	<--	Prob.	0.657	1.000				0,535	0,954
Prob. 22	<--	Prob.	0.710	1.130	0.097	11,699	<0,001		
Prob. 23	<--	Prob.	0.621	1.014	0.097	10,474	<0,001		
Prob. 24	<--	Prob.	0.805	1.236	0.096	12,814	<0,001		
Prob. 25	<--	Prob.	0.772	1.247	0.101	12,379	<0,001		
Prob. 34	<--	Prob.	0.714	1.177	0.102	11,593	<0,001		

Source: Created by the authors.

β1: Standard Coefficients, β2: Non-Standard Coefficients

The goal is to develop an instrument that is faithful to the theoretical framework of the construct, exhibits a stable and replicable factor structure, and maintains its validity across different samples and applications. This is key to enhancing the reliability and generalizability of the results (Deng et al., 2008; Hair et al., 2014; Cuhadar et al., 2021).

Table 15. Invariance analysis

Model	**χ2**	**df**	**χ2/df**	**SRMR**	**CFI**	**RMSEA**	**Δχ2**	**Δdf**	**ΔCFI**	**p-value for Δχ2**
Group1	75.42	41	1.84	0.05	0.96	0.07	-	-	-	
Group2	114.81	41	2.80	0.06	0.96	0.06	-	-	-	
Model 1: Configural	190.23	82	2.32	0.07	0.96	0.04	-	-	-	
Model 2: Weak Metric)	195.80	91	2.15	0.07	0.96	0.04	5.57	9	0.002	0.028
Model 3: Scalar	196.06	94	2.08	0.07	0.96	0.04	0.25	3	0.001	0.001
Model 4: Strong	205.50	107	1.92	0.07	0.96	0.04	9.44	13	0.001	0.046
Model 5: Partial Problem)	190.37	83	2.29	0.07	0.96	0.04	15.13	24	0.003	0.080

Δχ2: χ2 change (|χ2n- χ2n-1|); Δdf: df change (|dfn-dfn-1|); Δχ2/df: χ2/df change (|χ2n/ dfn -| χ2n-1/ dfn-1); ΔCFI: CFI change (|CFIn- CFIn-1|); ΔCFI<0,01**; p-value for Δχ2: χ2 significance value of change (p<0,05*)

Source: Created by the authors.

In this context, an invariance analysis covering both samples was conducted. An examination of the findings in Table 15 reveals that the ΔCFI value between the two sample groups is below the critical threshold of 0.01 recommended by Cheung and Rensvold (2002).

This result provides strong evidence for the invariance of the scale's structure across different samples. It can be concluded that the developed scale demonstrates invariance and is applicable to larger populations (Byrne, 2016).

As a result of the analyses, the GMP scale was structured with a total of 11 items under two dimensions (factors).

1st Dimension (factor): This was named "Perceived Consumer Barriers." This factor consists of five items, as listed below:

- Customer awareness is inadequate (factor loading=0.865).
- Awareness of environmental impacts is weak (factor loading=0.913).
- Consumers are reluctant to protect the environment (factor loading=0.768).
- The price of green products is expensive (factor loading=0.637).
- Consumers don't want to buy expensive eco-friendly products (factor loading=0.583).

2nd Dimension (factor): This was named "Operational and Competitive Inadequacies" and consists of six items, as listed below:

- We have problems in returning used packaging to suppliers (factor loading=0.634).
- We are not very successful in the resale of used parts (factor loading=0.655).
- We cannot compete because green production methods increase product costs (factor loading=0.805).
- The process of obtaining green standards/certificates is difficult for us (factor loading=0.81).
- We cannot compete against large companies that prioritize green marketing. (factor loading=0.819).
- We cannot recall products with quality problems (Factor loading=0.775).

In naming the two-factor structure that emerged from the Exploratory Factor Analysis, concepts were chosen to be clear, consistent with the theoretical background, and best reflective of the shared meaning of the items loading on each factor. Attention was given to the items with the highest factor loadings, as they are central to defining the core character of each factor.

A notable aspect of the "Perceived Consumer Barriers" factor is the inclusion of two semantically similar items: "Consumers find green products too expensive" (Item 4) and "Consumers don't want to buy more expensive eco-friendly products" (Item 5). While seemingly redundant, these items are deliberately retained to capture the nuanced distinction between cognitive perception and behavioral intention, a phenomenon widely known as the "attitude-behavior gap" in green consumerism (Carrington, 2010). The literature confirms

that while many consumers perceive green products as expensive (Mahmoud, 2018), a significant segment still expresses a willingness to pay a price premium for them, driven by factors such as environmental concern or perceived quality (Laroche et al., 2001). Our factor analysis supports this conceptual separation; both items load distinctly and significantly onto the same factor (0.637 and 0.583, respectively) without exhibiting excessively high correlations that would suggest multicollinearity. Retaining both allows the GMP scale to measure not only SME managers' perception of consumers' price sensitivity but also their perception of how this sensitivity translates into actual purchase unwillingness, thus providing a more granular diagnostic tool.

The first factor was named "Perceived Consumer Barriers". This designation was selected because all five of its constituent items point to consumer-driven market dynamics-such as a lack of awareness, price sensitivity, and reluctance-as the source of the problem, all reflected through the perceptual filter of SME managers. This name accurately represents the multidimensional nature of the factor, which encompasses cognitive, attitudinal, and economic barriers, while also methodologically underscoring that these barriers are based on managerial perception.

The second factor addresses more profound structural issues related to the SMEs' internal capabilities and market position, extending beyond mere cost considerations. Its content integrates challenges in operational processes like reverse logistics and quality management, administrative burdens such as green certification, and disadvantages in cost and market power compared to larger corporations. Therefore, the name "Operational and Competitive Inadequacies" was deemed most appropriate, as it holistically captures the resource and capability constraints of SMEs that this factor represents.

5. Results and Discussion

The primary objective of this study was to develop and validate a reliable scale for assessing the problems SMEs face when implementing green marketing. The final 11-item, two-factor GMP scale provides a psychometrically sound instrument for this purpose, revealing a significant strategic inconsistency among the SMEs in the Ostim OIZ. While firms attempt to meet market expectations by using "eco-friendly" labels, they simultaneously lack fundamental sustainability infrastructures. The developed GMP scale provides an opportunity to deeply analyze the interconnected barriers underlying this inconsistency. Critically, the emergent two-factor structure "Perceived Consumer Barriers" and "Operational and Competitive Inadequacies" is not merely a statistical artifact but is deeply grounded in established theoretical streams within the green marketing and SME literature.

The first factor, "Perceived Consumer Barriers," encapsulates the demand-side challenges that SMEs face and is theoretically rooted in the well-documented "attitude-behavior gap" (Carrington et al., 2010; Papadas et al., 2017). This

dimension aligns with the Theory of Planned Behavior (TPB), where factors like high price perception and low consumer awareness act as significant negative controls on green purchasing intentions (Ajzen, 1991). The strong perception among our sample that consumers find green products expensive and lack environmental awareness empirically demonstrates that these theoretical issues, such as the "green premium" reluctance (Padel & Foster, 2005), are acutely experienced by SME managers. This perception risks pushing managers into a passive stance, blaming the market's "unreadiness" for green marketing challenges rather than their own strategic shortcomings (Polonsky, 1994).

These external market pressures are further intensified by the supply-side constraints captured in the second factor, "Operational and Competitive Inadequacies." This dimension is theoretically grounded in the Resource-Based View (RBV), which explains competitive disadvantage through a firm's internal resource and capability limitations (Barney, 1991). The findings reveal a strong sentiment among SME managers of being competitively weak against larger corporations. This perception is directly linked to the operational inadequacies reported, such as difficulties in implementing reverse logistics and obtaining certifications, which highlights a significant lack of infrastructure and expertise. This resonates with literature identifying such deficits as core barriers to SME sustainability engagement (Revell & Rutherfoord, 2003; Rizos et al.,2017).

Therefore, a key theoretical contribution of this study is its conceptualization of these interconnected external and internal barriers not as isolated problems, but as a systemic vicious cycle that fosters strategic inertia. The scale's findings suggest a feedback loop: perceived weak consumer demand (Perceived Consumer Barriers) demotivates SMEs from making necessary investments in green capabilities. This investment deficit, in turn, exacerbates their "Operational and Competitive Inadequacies," weakening their market position and making it impossible to offer green products that meet price expectations. Contrary to studies that emphasize the potential agility of SMEs (Demirel & Danisman, 2019), our model posits that this cycle can neutralize that advantage. This holistic perspective demonstrates that the green transition of SMEs should be understood not through a focus on singular factors, but through strategies that encompass the entire business model, targeting both internal capabilities and external market communication.

Theoretical Implications

This study offers a key theoretical contribution by conceptualizing and empirically substantiating the challenges in SMEs' green marketing journey not as isolated problems, but as a systemic vicious cycle that fosters strategic inertia. This framework moves beyond simple lists of barriers by illustrating how they mutually reinforce one another. Our empirical results provide direct support for this cyclical model. The high mean scores observed for the "Perceived Consumer Barriers" factor (e.g., price sensitivity and low awareness) confirm that external market

pressures are acutely felt by SME managers. Simultaneously, the significant scores on the "Operational and Competitive Inadequacies" factor (e.g., lack of reverse logistics infrastructure and competitive weakness) demonstrate that these external pressures are compounded by profound internal firm constraints.

The theoretical linkage is this: perceived weak consumer demand (Factor 1) demotivates SMEs from making the necessary strategic and operational investments in green capabilities (Factor 2). This investment deficit, in turn, weakens their competitive position and operational efficiency, precluding them from offering green products that can meet market price expectations or effectively signal their value. This feedback loop, where external perceptions justify internal inaction and internal limitations prevent the overcoming of external barriers, is the core of the systemic cycle we propose. Consequently, contrary to studies that highlight the potential agility of SMEs (Demirel & Danisman, 2019), our model posits that this cycle can effectively neutralize that advantage, trapping SMEs in a state of strategic inertia regarding sustainability. This holistic perspective provides a more nuanced theoretical lens for understanding why SMEs struggle to advance in their green transition, shifting the focus from singular obstacles to the interconnected system that perpetuates them.

The second major contribution, which allows for the empirical investigation of this theoretical framework, is the introduction of the validated and reliable GMP scale to the literature. This scale fills a significant gap by serving a dual function. On one hand, it provides academics with a concrete tool to test complex relationships, such as the systemic cycle identified in this study, and to answer new research questions, for instance, "How do green marketing problems differ for SMEs across various sectors?" On the other hand, it serves as a practical diagnostic instrument for SME managers and policymakers, enabling the identification of strategic areas for improvement and facilitating more data-driven guidance for green transition efforts.

In essence, the GMS scale has the potential to advance the field by both enriching theoretical frameworks and guiding practical applications. A key practical implication stemming from the identification of this systemic cycle is that support for SMEs' green transition must extend beyond mere financial aid. To be effective, support mechanisms should be designed holistically to enhance operational capabilities, foster supply chain integration, and build skills in value-driven marketing communication.

Managerial Implications

The findings of this study and the developed GMP scale offer actionable insights for SME managers, industry associations, and policymakers aiming to break the systemic cycle of green marketing inertia.

First, for SME managers, the scale can serve as a powerful internal diagnostic tool. By administering the 11-item scale within their management teams,

leaders can identify whether their primary perceived barriers are consumer-related or operational. For instance, a high score on the "Perceived Consumer Barriers" factor should prompt managers to invest in targeted consumer education campaigns. Rather than broad "green" messaging, these could focus on clarifying the long-term value of their products to justify price premiums or using digital platforms to transparently communicate their environmental efforts, thus tackling the awareness deficit directly. Conversely, a high score on the "Operational and Competitive Inadequacies" factor signals a need to look inward. Managers should prioritize seeking strategic partnerships for reverse logistics or exploring collaborative platforms with other SMEs to share the costs of green certifications and infrastructure. This shifts the focus from passively waiting for market readiness to proactively building the necessary capabilities.

Second, for industry associations and supporting institutions, the findings underscore that support for SMEs must be systemic, not singular. Financial incentives alone are insufficient if SMEs perceive a lack of consumer demand. Therefore, support mechanisms should be twofold:

- Demand-Side Initiatives: Supporting institutions could launch national or regional campaigns to boost consumer awareness and combat greenwashing, thereby creating a more favorable market environment for SMEs.
- Capability-Building Programs: Support should extend beyond financial aid to include subsidized training on circular economy practices, workshops on efficient green production, and the creation of shared logistical platforms for reverse logistics and recycling.

By using the GMP scale as a diagnostic instrument, both individual SMEs and supporting institutions can develop more targeted, evidence-based strategies that address the specific bottlenecks within the systemic cycle, facilitating a more effective green transition.

Policy Implications

The study's findings provide clear guidance for public authorities aiming to support the green transition of SMEs. Our results indicate that SMEs face significant challenges regarding certification costs and operational upgrades, suggesting that current support mechanisms are insufficient. Therefore, more effective and comprehensive measures by central governments are required to accelerate the green transition for these enterprises.

Firstly, government-subsidized certification programs and financial aid will directly reduce operational barriers. Furthermore, financial incentives such as tax benefits and low-interest loans for SMEs that invest in clean technologies will mitigate the high costs of green production, making these investments more feasible for businesses.

Finally, official institutions should launch national awareness

campaigns to boost consumer demand for sustainable products. These initiatives will educate the public on the value of green products, justifying higher price points and fostering stronger market demand. A holistic approach that addresses both internal capabilities and external market dynamics is essential for a sustainable industrial ecosystem.

6. Conclusion

This study aimed to develop and validate a reliable instrument for measuring the problems SMEs face in their green marketing journey. Through a rigorous methodological process, the research successfully produced the 11-item, two-factor Green Marketing Problems (GMP) Scale. The primary theoretical contribution emerging from this work is the conceptualization of these challenges not as isolated obstacles, but as a systemic vicious cycle. Our findings suggest that SMEs are caught in a feedback loop where perceived external consumer barriers (such as price sensitivity and low awareness) both trigger and are reinforced by internal operational and competitive inadequacies. This cycle fosters a state of strategic inertia, hindering the effective green transition of small and medium-sized enterprises.

While these conclusions are drawn from a contextually specific and self-reported sample, a key limitation of the study, the developed GMP scale represents a significant and forward-looking contribution. It provides a validated tool to fill a methodological gap, enabling a shift from descriptive cataloguing to quantitative and comparative analysis of the barriers SMEs face. For managers, the scale offers a practical diagnostic instrument to identify the specific bottlenecks in this systemic cycle, allowing them to move beyond blaming external factors and toward building internal capabilities. For policymakers and supporting institutions, it provides an evidence-based tool to design more holistic interventions that address both consumer perceptions and operational realities simultaneously.

Looking ahead, the GMP scale provides a foundational platform for future research. Priorities should include longitudinal studies to track the evolution of these problems over time, as well as cross-cultural and cross-sectoral applications to test the scale's generalizability. By facilitating a deeper, more systematic understanding of the interconnected challenges in SME green marketing, this research and the instrument it produced aim to pave the way for more targeted and effective strategies to support the vital role of SMEs in building a sustainable future.

Limitations

The findings of this study should be interpreted considering several limitations.

First, the study's generalizability is constrained by its geographical and sampling design. Data were collected from a single, highly developed industrial zone in Ankara, Turkey (Ostim OIZ). Consequently, the specific distribution and intensity of perceived problems may not be transferable to the entire population of

SMEs in Turkey, particularly those in less-developed regions or different sectors. This geographical confinement is coupled with a potential self-selection bias, as a significant portion of the data was gathered at industry trade fairs. As research suggests, firms participating in such events tend to be more outward-facing and proactive (Sarmad & Ali, 2022). While this approach was pragmatic for accessing knowledgeable respondents, it likely resulted in an underrepresentation of more insular or less resource-endowed firms, meaning our findings might be more characteristic of engaged SMEs rather than the broader SME community.

Second, the study's methodology relies on self-reported data and a cross-sectional design, which introduces further limitations. The GMP scale measures managers' perceptions of problems, which are subjective and may not perfectly align with objective operational realities. This reliance on self-reports carries an inherent risk of Social Desirability Bias (SDB). Although procedural remedies were employed to mitigate this risk, such as ensuring anonymity and focusing on concrete "problems" rather than abstract "successes," the potential influence of SDB was not statistically controlled for and cannot be fully disentangled (Podsakoff et al., 2003; Larson, 2019). Furthermore, the cross-sectional nature of the data provides a static snapshot at a single point in time. This design does not allow for the analysis of causal relationships or the tracking of how perceptions of green marketing problems evolve over time in response to market or policy shifts.

Finally, while the quantitative approach was effective for the primary goal of scale development and validation, it has a limited capacity for providing an in-depth understanding of the challenges. The findings would be significantly enriched by supplementary qualitative research, such as in-depth interviews or case studies, to explore the nuanced, contextual experiences behind the barriers identified by the scale.

Future studies

The development and initial validation of the Green Marketing Problems (GMP) scale in this study open up several promising avenues for future research, centered on enhancing its validity, expanding its application, and deepening its theoretical integration.

First, a critical next step is to enhance the external validity and generalizability of the scale. The current study was limited to a single industrial zone and utilized non-probabilistic sampling. Future research should test the GMP scale on larger and more representative samples, employing systematic sampling methods that include SME managers from diverse geographical regions across Turkey and beyond. Such cross-cultural applications are essential, as they would not only test the psychometric invariance of the scale but also provide invaluable comparative insights into how national culture, regulatory environments, and consumer awareness levels shape the challenges SMEs face globally. Similarly, applying the scale across different sectors (e.g., services, agriculture, tourism) will

reveal how the nature and intensity of green marketing problems vary by industry context, facilitating sectoral comparisons and the transfer of best practices.

Second, future research should employ longitudinal designs to overcome the limitations of our cross-sectional approach. Longitudinal validation would allow for an examination of the scale's temporal stability and an analysis of how perceived barriers evolve in response to policy interventions or market shifts. More importantly, this design would enable researchers to move beyond correlation and test the causal relationships between the systemic cycle of barriers and objective firm performance metrics (e.g., profitability, market share), thereby empirically testing the "strategic inertia" concept proposed in this paper.

Third, the GMP scale can be integrated into broader theoretical models to explore the antecedents and consequences of these perceived problems. For instance, studies could investigate how owner-manager characteristics (e.g., environmental values, educational background) influence their scores on the scale's two factors. Furthermore, a crucial area for future inquiry is the relationship between perceived problems and social desirability. Future research could empirically test the correlation between the GMP scale and standard Social Desirability Bias (SDB) scales, such as the Marlowe-Crowne (Vésteinsdóttir et al., 2017). As Larson (2019) notes, controlling for SDB is methodologically important. Investigating behavior-specific SDB indicators, as suggested by Zhu et al. (2024), within the context of the GMP scale would be a novel contribution, revealing which specific green marketing problems are most susceptible to socially desirable reporting.

Finally, while the GMP scale is holistic, future scale development could also focus on creating modular instruments that measure specific sub-dimensions of green marketing challenges (e.g., product design, reverse logistics, green communication). Such an approach would allow for a more granular assessment of SMEs' capabilities, pinpointing specific areas of strength and those requiring targeted improvement.

REFERENCES

Abbas, J. (2024). Does the nexus of corporate social responsibility and green dynamic capabilities drive firms toward green technological innovation? The moderating role of green transformational leadership. Technological Forecasting and Social Change, 208, 123698. https://doi.org/10.1016/j.techfore.2024.123698

Abeele, V. V., Spiel, K., Nacke, L., Johnson, D., & Gerling, K. (2020). Development and validation of the player experience inventory: A scale to measure player experiences at the level of functional and psychosocial consequences. International Journal of Human-Computer Studies, 135, 102370. https://doi.org/10.1016/j.ijhcs.2019.102370

Agarwal, P. K., & Choudhary, H. (2021, June 1). Green Marketing: Need of the 21 St Century. Sustainable Innovation, Research & Emerging Trends in

Entrepreneurship, Rajasthan, India. https://www.researchgate.net/publication/352020780_GREEN_MARKETING_NEED_OF_THE_21_ST_CENTURY

Agrawal, R., Agrawal, S., Samadhiya, A., Kumar, A., Luthra, S., & Jain, V. (2024). Adoption of green finance and green innovation for achieving circularity: An exploratory review and future directions. Geoscience Frontiers, 15(4), 101669. https://doi.org/10.1016/j.gsf.2023.101669

Ahmad, S., Shakir, M. I., Azam, A., Mahmood, S., Zhang, Q., & Ahmad, Z. (2023). The impact of CSR and green consumption on consumer satisfaction and loyalty: Moderating role of ethical beliefs. Environmental Science and Pollution Research, 30(53), 113820–113834. https://doi.org/10.1007/s11356-023-29930-7

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

Anwar, H., Waheed, R., & Aziz, G. (2024). Importance of FinTech and green finance to achieve the carbon neutrality targets: A study of Australian perspective. Environmental Research Communications, 6(11), 115007. https://doi.org/10.1088/2515-7620/ad853d

Ayre, C., & Scally, A. J. (2014). Critical Values for Lawshe's Content Validity Ratio. Measurement and Evaluation in Counseling and Development, 47(1), 79–86. (world). https://doi.org/10.1177/0748175613513808

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Barrow, C. (2024). Environmental Management: Introduction, Challenges, Opportunities. Taylor & Francis.

Bougie, R., & Sekaran, U. (2019). Research Methods For Business: A Skill Building Approach. John Wiley & Sons.

Burns, A. C., & Bush, R. F. (2005). Marketing Research. Pearson/Prentice Hall.

Byrne, B. M. (2016). Structural equation modeling with AMOS: Basic concepts, applications, and programming. (Third Edition). Routledge. https://doi.org/10.4324/9781315757421

Carpenter, S. (2018). Ten Steps in Scale Development and Reporting: A Guide for Researchers. Communication Methods and Measures, 12(1), 25–44. (world). https://doi.org/10.1080/19312458.2017.1396583

Carrington, M. J., Neville, B. A., & Whitwell, G. J. (2010). Why Ethical Consumers Don't Walk Their Talk: Towards a Framework for Understanding the Gap Between the Ethical Purchase Intentions and Actual Buying Behaviour of Ethically Minded Consumers. Journal of Business Ethics, 97(1), 139–158. https://doi.org/10.1007/s10551-010-0501-6

Chen, Y.-S., Lai, S.-B., & Wen, C.-T. (2006). The Influence of Green Innovation Performance on Corporate Advantage in Taiwan. Journal of Business Ethics, 67(4), 331–339. https://doi.org/10.1007/s10551-006-9025-5

Cheung, G. W., & and Rensvold, R. B. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. Structural Equation Modeling: A

Multidisciplinary Journal, 9(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Comrey, A. L., & Lee, H. B. (1992). A first course in factor analysis, 2nd ed (pp. xii, 430). Lawrence Erlbaum Associates, Inc.

Cronin, J. J., Smith, J. S., Gleim, M. R., Ramirez, E., & Martinez, J. D. (2011). Green marketing strategies: An examination of stakeholders and the opportunities they present. Journal of the Academy of Marketing Science, 39(1), 158–174. https://doi.org/10.1007/s11747-010-0227-0

Cudeck, R., & O'Dell, L. L. (1994). Applications of standard error estimates in unrestricted factor analysis: Significance tests for factor loadings and correlations. Psychological Bulletin, 115(3), 475–487. https://doi.org/10.1037/0033-2909.115.3.475

Cuhadar, I., Yang, Y., & Paek, I. (2021). Consequences of Ignoring Guessing Effects on Measurement Invariance Analysis. Applied Psychological Measurement, 45(4), 283–296. https://doi.org/10.1177/01466216211013915

Dangelico, R. M., & Vocalelli, D. (2017). "Green Marketing": An analysis of definitions, strategy steps, and tools through a systematic review of the literature. Journal of Cleaner Production, 165, 1263–1279. https://doi.org/10.1016/j.jclepro.2017.07.184

Demir, B., Akdemir, M. A., Kara, A. U., Sagbas, M., Sahin, Y., & Topcuoglu, E. (2025). The Mediating Role of Green Innovation and Environmental Performance in the Effect of Green Transformational Leadership on Sustainable Competitive Advantage. Sustainability, 17(4), Article 4. https://doi.org/10.3390/su17041407

Demirel, P., & Danisman, G. O. (2019). Eco-innovation and firm growth in the circular economy: Evidence from European small- and medium-sized enterprises. Business Strategy and the Environment, 28(8), 1608–1618. https://doi.org/10.1002/bse.2336

Deng, X., Doll, W. J., Al-Gahtani, S. S., Larsen, T. J., Pearson, J. M., & Raghunathan, T. S. (2008). A cross-cultural analysis of the end-user computing satisfaction instrument: A multi-group invariance analysis. Information & Management, 45(4), 211–220. https://doi.org/10.1016/j.im.2008.02.002

Diez-Martin, F., Blanco-Gonzalez, A., & Prado-Roman, C. (2019). Research Challenges in Digital Marketing. Sustainability, 11(10), Article 10. https://doi.org/10.3390/su11102839

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/10.2307/3151312

Friesner, D., Bozman, C., McPherson, M., Valente, F., & Zhang, A. (2021). Information Entropy and Scale Development. Journal of Survey Statistics and Methodology, 9(5), 1183–1203. https://doi.org/10.1093/jssam/smaa034

Gao, D., & Ma, M. (2024). The impact of green credit on the green transformation of the manufacturing industry. Environmental Research Communications, 6(11), 115005. https://doi.org/10.1088/2515-7620/ad8b9a

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). Multivariate Data Analysis (7th ed.). Pearson.

Horn, J. L. (1965). A Rationale and Test for the Number of Factors in Factor Analysis. Psychometrika, 30(2), 179–185. https://doi.org/10.1007/BF02289447

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), Article 1. https://doi.org/10.1080/10705519909540118

Irshad, O., Ahmad, S., & Mahmood, S. (2024). Fostering Purchase Intentions Through CSR and Service Quality: The Role of Customer Satisfaction, Brand Loyalty, and Admiration. Sustainability, 16(23), 10584. https://doi.org/10.3390/su162310584

Jain, S. K., & Kaur, G. (2004). Green Marketing: An Attitudinal and Behavioural Analysis of Indian Consumers. Global Business Review, 5(2), 187–205. https://doi.org/10.1177/097215090400500203

Kääriäinen, M., Kanste, O., Elo, S., Pölkki, T., Miettunen, J., & Kyngäs, H. (2011). Testing and verifying nursing theory by confirmatory factor analysis. Journal of Advanced Nursing, 67(5), 1163–1172. https://doi.org/10.1111/j.1365-2648.2010.05561.x

Kang, M., & Johnson, K. K. P. (2011). Retail Therapy: Scale Development. Clothing and Textiles Research Journal, 29(1), 3–19. https://doi.org/10.1177/0887302X11399424

Kleindorfer, P. R., Singhal, K., & Van Wassenhove, L. N. (2005). Sustainable Operations Management. Production and Operations Management, 14(4), 482–492. https://doi.org/10.1111/j.1937-5956.2005.tb00235.x

Koç, E. (2023). Green Marketing Strategies and Climate Change Awareness in Sustainable Transportation: The Case of Airline Companies. Marine Science and Technology Bulletin, 12(4), Article 4. https://doi.org/10.33714/masteb.1375842

Laroche, M., Bergeron, J., & Barbaro-Forleo, G. (2001). Targeting consumers who are willing to pay more for environmentally friendly products. Journal of Consumer Marketing, 18(6), 503–520. https://doi.org/10.1108/EUM0000000006155

Larson, R. B. (2019). Controlling social desirability bias. International Journal of Market Research, 61(5), 534–547. https://doi.org/10.1177/1470785318805305

Lawshe, C. H. (1975). A Quantitative Approach to Content Validity. Personnel Psychology, 28(4), 563–575. https://doi.org/10.1111/j.1744-6570.1975.tb01393.x

Luo, L., Arizmendi, C., & Gates, K. M. (2019). Exploratory Factor Analysis (EFA) Programs in R. Structural Equation Modeling: A Multidisciplinary Journal, 26(5), 819–826. (world). https://doi.org/10.1080/10705511.2019.1615835

Mahmood, S., Sun, H., Iqbal, A., Alhussan, A. A., & El-kenawy, E.-S. M. (2024). Green finance, sustainable infrastructure, and green technology innovation: Pathways to achieving sustainable development goals in the belt and road

initiative. Environmental Research Communications, 6(10), 105036. https://doi.org/10.1088/2515-7620/ad898f

Mahmoud, T. O. (2018). Impact of green marketing mix on purchase intention. International Journal of Advanced and Applied Sciences, 5(2), 127–135. https://doi.org/10.21833/ijaas.2018.02.020

Marcatajo, G. (2022). Abuse of consumer trust in the digital market and the green market: The case of green washing in the Italian legal system. Journal of Financial Crime, 30(6), 1692–1705. (world). https://doi.org/10.1108/JFC-10-2022-0242

Martin, D., & Schouten, J. (2012). Sustainable Marketing. Prentice Hall.

Mendleson, N., & Polonsky, M. J. (1995). Using strategic alliances to develop credible green marketing. Journal of Consumer Marketing, 12(2), 4–18. https://doi.org/10.1108/07363769510084867

Mesmer-Magnus, J. R., Viswesvaran, C., & Wiernik, B. M. (2013). Book Highlight—The Role of Commitment in Bridging the Gap Between Organizational and Environmental Sustainability. Global Business and Organizational Excellence, 32(5), 86–104. https://doi.org/10.1002/joe.21506

Norman, W., & MacDonald, C. (2004). Getting to the Bottom of "Triple Bottom Line." Business Ethics Quarterly, 14(2), 243–262. https://doi.org/10.5840/beq200414211

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). McGraw-Hill Education.

Oktaysoy, O., Topcuoglu, E., Ozgen-Cigdemli, A. O., Kaygin, E., Kosa, G., Turan-Torun, B., Kobanoglu, M. S., & Uygungil-Erdogan, S. (2025). The mediating role of job satisfaction in the effect of green transformational leadership on intention to leave the job. Frontiers in Psychology, 16. https://doi.org/10.3389/fpsyg.2025.1490203

Önem, Ş., & Selvi, M. S. (2024). Scale Development on the Effect of Social Media Influencers on Purchase Intention. Journal of Mehmet Akif Ersoy University Economics and Administrative Sciences Faculty, 11(2), Article 2. https://doi.org/10.30798/makuiibf.1432546

OSTİM. (2025a). OSTİM Hakkında [Kurum]. https://www.ostim.org.tr/sizin-fabrikaniz-ostim

OSTİM. (2025b). Yeşil Dönüşüm ve Sürdürülebilirlik Ofisi. https://www.ostim.org.tr/yesil-donusum-ve-surdurulebilirlik-ofisi

Ottem, E. (2003). Confirmatory factor analysis of the WPPSI for language-impaired children. Scandinavian Journal of Psychology, 44(5), 433–439. https://doi.org/10.1046/j.1467-9450.2003.00364.x

Padel, S., & Foster, C. (2005). Exploring the gap between attitudes and behaviour. British Food Journal, 107(8), 606–625. https://doi.org/10.1108/00070700510611002

Papadas, K.-K., Avlonitis, G. J., & Carrigan, M. (2017). Green marketing orientation: Conceptualization, scale development and validation. Journal of Business Research, 80, 236–246. https://doi.org/10.1016/j.jbusres.2017.05.024

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology, 88(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Polonsky, M. J. (1994). An Introduction To Green Marketing. Electronic Green Journal, 1(2). https://doi.org/10.5070/G31210177

Revell, A., & Rutherfoord, R. (2003). UK environmental policy and the small firm: Broadening the focus. Business Strategy and the Environment, 12(1), 26–35.

Rizos, V., Tuokko, K., & Behrens, A. (2017). The Circular Economy: A review of definitions, processes and impacts. CEPS Papers, CEPS Papers, Article 12440. https://ideas.repec.org//p/eps/cepswp/12440.html

Sarmad, I., & Ali, R. (2022). Determinants of Sustainable Marketing Activities and their Impact on Customer Loyalty. Abasyn Journal of Social Sciences, 15(2), 123–133. https://doi.org/10.34091/AJSS.15.2.03

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit Measures. Methods of Psychological Research, 8(2), 23–74.

Shevlin, M., Miles, J. N. V., Davies, M. N. O., & Walker, S. (2000). Coefficient alpha: A useful indicator of reliability? Personality and Individual Differences, 28(2), 229–237. https://doi.org/10.1016/S0191-8869(99)00093-8

Sonmez, V., & Alacapinar, F. G. (2013). Exemplified scientific research methods. Ani Publishing.

Soulard, J., McGehee, N., & Knollenberg, W. (2021). Developing and Testing the Transformative Travel Experience Scale (TTES). Journal of Travel Research, 60(5), 923–946. https://doi.org/10.1177/0047287520919511

TURKONFED. (n.d.). European Green Deal and SMEs Report. TÜRKONFED. Retrieved July 16, 2025, from https://turkonfed.org/en/detail/3452/turkonfed-published-the-european-green-deal-and-smes-report

Vésteinsdóttir, V., Reips, U.-D., Joinson, A., & Thorsdottir, F. (2017). An item level evaluation of the Marlowe-Crowne Social Desirability Scale using item response theory on Icelandic Internet panel data and cognitive interviews. Personality and Individual Differences, 107, 164–173. https://doi.org/10.1016/j.paid.2016.11.023

Vilkaite-Vaitone, N., Skackauskiene, I., & Díaz-Meneses, G. (2022). Measuring Green Marketing: Scale Development and Validation. Energies, 15(3), Article 3. https://doi.org/10.3390/en15030718

Weng, L.-J., & Cheng, C.-P. (2005). Parallel Analysis with Unidimensional Binary Data. Educational and Psychological Measurement, 65(5), 697–716. https://doi.org/10.1177/0013164404273941

Whittaker, T. A., & Worthington, R. L. (2016). Item Response Theory in Scale Development Research: A Critical Analysis. The Counseling Psychologist, 44(2), 216–225. https://doi.org/10.1177/0011000015626273

Wulani, F., Purwanto, B. M., & Handoko, H. (2014). Abusive Supervision Scale Development in Indonesia. Gadjah Mada International Journal of Business, 16(1), Article 1. https://doi.org/10.22146/gamaijb.5467

Zhu, O. Y., Greene, D., & Dolnicar, S. (2024). Should the risk of social desirability bias in survey studies be assessed at the level of each pro-environmental behaviour? Tourism Management, 104, 104933. https://doi.org/10.1016/j.tourman.2024.104933