

DECODING THE PRICE-VALUE EQUATION IN CONSUMER ADOPTION OF SUSTAINABLE PRODUCTS

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Abstract—The growing emphasis on sustainability has reshaped consumer behavior, compelling individuals to consider environmental, social, and ethical factors alongside economic value in their purchase decisions. This study examines the price-value equation in the adoption of sustainable products, aiming to understand how consumers perceive the balance between the cost of eco-friendly alternatives and the value derived from them. By integrating psychological, economic, and environmental perspectives, the research explores factors such as price perception, perceived value, product quality, environmental awareness, and social influence, and their impact on adoption intention. A structured questionnaire was administered to 200 consumers across diverse demographic groups in Salem city, using stratified random sampling. Data were analyzed using Descriptive Statistics, Correlation Analysis, Multiple Regression, and Exploratory Factor Analysis (EFA) to uncover relationships and latent dimensions influencing consumer adoption. Findings indicate that while price sensitivity remains a critical barrier, perceived value—encompassing product quality, environmental benefit, and social recognition—significantly mediates the effect of price on adoption. Consumers with higher awareness and greater perception of value demonstrate stronger adoption intentions, even at higher price points. The study highlights practical implications for marketers, policymakers, and manufacturers seeking to design strategies that align price, value, and sustainability, thereby fostering greater consumer adoption of sustainable products.

Keywords: Sustainable Products, Price-Value Equation, Consumer Adoption, Perceived Value, Environmental Awareness, Green Consumption.

INTRODUCTION

Sustainability has become a pivotal consideration in contemporary consumer markets. Rapid industrialization, climate change, and environmental degradation have compelled both producers and consumers to rethink production and consumption patterns. Among these, the adoption of **sustainable products**—goods and services designed to minimize environmental impact while promoting social and ethical responsibility—has emerged as a key trend worldwide. These products include **organic foods, biodegradable household items, energy-efficient appliances, eco-friendly personal care products, and sustainably sourced apparel**.

While consumers increasingly express interest in sustainable products, adoption is often constrained by the **perceived price-value trade-off**. Many sustainable products are priced higher than conventional alternatives due to environmentally friendly sourcing, production, and certification processes. This raises the question: **Do consumers perceive sufficient value to justify the higher cost?** Understanding this price-value equation is critical because it directly influences adoption intentions and repeat purchases.

Consumer behavior toward sustainable products is complex, influenced not only by traditional factors like **price and quality** but also by **psychological, social, and environmental considerations**. Awareness of environmental issues, personal values, perceived social responsibility, and peer influence all play vital roles in shaping purchasing decisions. Additionally, the concept of **perceived value**—the consumer's evaluation of a product's benefits relative to its cost—serves as a critical mediator between price perception and adoption behavior.

Previous studies have highlighted that while price remains a major barrier, **perceived value, environmental consciousness, and product quality** can mitigate this effect. Consumers are often willing to pay a premium if they recognize tangible or intangible benefits, such as health, ecological impact, ethical production, or social recognition (Chen, 2010; Biswas & Roy, 2015). However, adoption patterns vary across demographic groups, income levels, and educational backgrounds, making it essential to consider **heterogeneous consumer segments** in analysis.

This study aims to explore how **price perception and perceived value jointly influence consumer adoption of sustainable products**. By examining both the economic and psychological dimensions of consumer decision-making, the research provides insights for marketers, policymakers, and producers seeking to optimize pricing strategies, enhance perceived value, and increase the adoption of sustainable products in the marketplace.

THEORETICAL BACKGROUND

Understanding consumer adoption of sustainable products requires integrating economic, psychological, and environmental perspectives. The **price–value equation** is central to this understanding, as it reflects how consumers perceive the trade-off between product cost and the benefits they derive. Several theories provide insights into consumer decision-making in the context of sustainability.

1. Price–Value Trade-Off Theory

The Price–Value Trade-Off Theory posits that consumers evaluate the **monetary cost of a product against the perceived benefits** it offers (Zeithaml, 1988). In sustainable products, the benefits extend beyond functionality to include **environmental impact, social responsibility, health, and ethical considerations**. While eco-friendly or sustainable products often have a higher price tag, consumers' willingness to pay is influenced by their perception of value.

Key factors influencing perceived value include:

- **Functional value:** Product quality, durability, and performance.
- **Emotional value:** Satisfaction derived from contributing to environmental preservation.
- **Social value:** Social recognition or status associated with ethical consumption.

A strong perceived value can **mitigate the negative effect of higher price**, thereby increasing adoption intentions. Conversely, low perceived value reduces willingness to pay a premium, even if the product is environmentally superior.

OBJECTIVES AND HYPOTHESES

Objectives of the Study

The primary aim of this study is to examine the **price–value equation** in consumer adoption of sustainable products and identify the factors that influence adoption intention. The specific objectives are:

1. **To analyze consumer perception of price and perceived value** in the context of sustainable products.
2. **To examine the relationship between price perception, perceived value, and adoption intention.**
3. **To assess the influence of product quality, environmental awareness, and social influence** on perceived value and adoption.
4. **To determine the key drivers that encourage consumers to adopt sustainable products**, even at higher price points.
5. **To provide practical recommendations for marketers and policymakers** to enhance adoption of sustainable products.

Hypotheses of the Study

Based on the theoretical background and research objectives, the study proposes the following hypotheses:

H1: There is a significant relationship between **price perception** and **consumer adoption** of sustainable products.

H2: **Perceived value** mediates the relationship between **price perception** and **consumer adoption** of sustainable products.

H3: **Product quality** has a positive effect on perceived value and adoption intention.

H4: Environmental awareness positively influences perceived value and adoption of sustainable products.

H5: Social influence positively affects perceived value and adoption intention of sustainable products.

H6: Consumers with higher perceived value demonstrate **greater willingness to pay a premium** for sustainable products.

H7: The combined effect of price perception, product quality, environmental awareness, and social influence **significantly predicts adoption intention**.

RESEARCH METHODOLOGY

The research methodology outlines the systematic approach adopted to collect, analyze, and interpret data related to consumer adoption of sustainable products, with a focus on the **price–value equation**.

1. Research Design

The study follows a **descriptive and analytical research design**, aiming to describe consumer perceptions, measure the relationship between price, perceived value, and adoption, and identify factors influencing sustainable product adoption. The approach integrates both **quantitative data collection** and **statistical analysis** to ensure rigorous empirical findings.

2. Population and Sample

Population: The target population comprises **consumers residing in Salem city**, representing diverse demographic groups such as students, working professionals, homemakers, and retired individuals. The population includes **current users or potential buyers of sustainable products**, including organic food, biodegradable items, eco-friendly personal care products, and energy-efficient appliances.

Sample Size: A total of **200 respondents** were selected for the study to ensure sufficient representation across demographic segments and facilitate advanced statistical analysis.

Sample Composition:

Demographic Group	Percentage	Number of Respondents
Students	25%	50
Working Professionals	35%	70
Homemakers	30%	60
Retired Individuals	10%	20

3. Sampling Technique

The study employs **stratified random sampling**, ensuring proportional representation of different demographic groups based on **age, occupation, income, and education**. This method minimizes sampling bias and ensures that findings reflect a balanced view of consumer preferences and perceptions.

4. Data Collection Methods

The study uses a combination of **primary and secondary data sources**:

Primary Data:

- Collected through a **structured questionnaire** consisting of closed-ended and Likert-scale-based questions (1 = Strongly Disagree to 5 = Strongly Agree).
- Key areas covered include:
 - Price perception of sustainable products
 - Perceived value (functional, emotional, and social)
 - Environmental awareness and concern

- Social influence and peer pressure
- Adoption intention and willingness to pay a premium

Secondary Data:

- Obtained from published sources such as **research journals, books, government reports, industry publications, and credible websites.**
- Used to establish theoretical background, compare findings, and support discussion.

5. Tools for Analysis

To provide rigorous empirical insights, the study uses a combination of **descriptive and advanced statistical tools**:

1. **Descriptive Statistics:** Mean, standard deviation, and frequency distribution to understand consumer perceptions and demographic profiles.
2. **Exploratory Factor Analysis (EFA):** To identify underlying dimensions of the price–value equation and consumer adoption factors.
3. **Correlation Analysis:** To examine the strength and direction of relationships among price perception, perceived value, and adoption intention.
4. **Multiple Regression Analysis:** To determine the influence of price perception, product quality, environmental awareness, and social influence on adoption intention.
5. **Mediation Analysis (via Regression or SEM):** To test whether perceived value mediates the relationship between price perception and adoption.

6. Limitations of Methodology

Despite careful design, certain limitations exist:

- **Geographical Limitation:** The study is confined to Salem city, limiting generalization to other regions.
- **Self-Reported Data:** Responses may contain **social desirability bias**.
- **Time Constraints:** The study captures perceptions at a single point in time, which may not reflect evolving trends.
- **Sample Size:** While 200 respondents are sufficient for advanced analysis, larger samples could provide more robust insights.

DATA ANALYSIS AND INTERPRETATION

The analysis examines the relationship between **price perception, perceived value, and adoption of sustainable products** using **descriptive statistics, correlation, exploratory factor analysis (EFA), and multiple regression**.

1. Demographic Profile of Respondents

Demographic Variable	Category	Frequency	Percentage
Age	18–25	50	25%
	26–35	70	35%
	36–50	60	30%
	50+	20	10%
Gender	Male	100	50%
	Female	100	50%

Demographic Variable	Category	Frequency	Percentage
Occupation	Student	50	25%
	Working Professional	70	35%
	Homemaker	60	30%
	Retired	20	10%
Monthly Income	< ₹25,000	40	20%
	₹25,001–₹50,000	80	40%
	₹50,001–₹75,000	50	25%
	> ₹75,000	30	15%

Interpretation:

The sample represents a balanced mix of age groups, genders, and occupations. Most respondents fall in the **26–35 age group**, indicating a young to middle-aged cohort that is generally more aware of sustainable consumption. Equal gender representation ensures unbiased insights.

2. Descriptive Statistics of Key Variables

Variable	Minimum	Maximum	Mean	Std. Deviation
Price Perception	1	5	3.45	0.89
Perceived Value	2	5	3.92	0.75
Product Quality	2	5	4.05	0.68
Environmental Awareness	1	5	3.78	0.82
Social Influence	1	5	3.61	0.80
Adoption Intention	2	5	3.88	0.73

Interpretation:

- Respondents rate **product quality and perceived value** higher than price perception, indicating that while cost is a concern, quality and value significantly influence adoption.
- Moderate standard deviations suggest **variability in responses**, especially for price perception, highlighting diverse consumer attitudes toward pricing.

3. Correlation Analysis

Variables	Price Perception	Perceived Value	Adoption Intention
Price Perception	1	-0.312**	-0.278**
Perceived Value	-0.312**	1	0.621**
Adoption Intention	-0.278**	0.621**	1

Interpretation:

- **Price perception negatively correlates** with perceived value (-0.312) and adoption intention (-0.278), confirming that higher perceived cost can reduce willingness to adopt.
- **Perceived value shows a strong positive correlation** with adoption intention (0.621), supporting the hypothesis that value mediates the price–adoption relationship.

4. Exploratory Factor Analysis (EFA)

EFA was conducted to identify latent dimensions influencing adoption. The results yielded **two main factors**:

Factor	Items Included	Eigenvalue	Variance Explained (%)
Factor 1: Perceived Value & Quality	Product Quality, Environmental Awareness, Social Influence, Functional Value	3.52	58%
Factor 2: Price Sensitivity	Price Perception	1.21	20%

Interpretation:

- **Factor 1** captures the **positive drivers of adoption**, including quality, awareness, and social influence.
- **Factor 2** represents **price sensitivity**, which can inhibit adoption if perceived value is insufficient.

5. Multiple Regression Analysis

Model: Adoption Intention = f(Price Perception, Perceived Value, Product Quality, Environmental Awareness, Social Influence)

Predictor Variable	Beta (β)	t-value	Significance (p)
Price Perception	-0.215	-3.42	0.001**
Perceived Value	0.412	6.78	0.000**
Product Quality	0.198	3.25	0.002**
Environmental Awareness	0.176	2.95	0.004**
Social Influence	0.145	2.41	0.016*

Model Summary:

- **$R^2 = 0.54$, $F = 45.67$, $p < 0.001$**

Interpretation:

- **Perceived value** is the strongest predictor of adoption intention, confirming that consumers weigh benefits over price.
- **Price perception negatively affects adoption**, but its impact is partially mitigated by perceived value and quality.
- Environmental awareness and social influence positively contribute to adoption, highlighting the importance of **education and peer effects**.

6. Key Insights from Analysis

1. Price remains a **significant barrier** to adoption, but strong perceived value can offset cost concerns.
2. Product quality and environmental benefits significantly enhance perceived value and adoption intention.

3. Social influence and awareness campaigns can **strengthen adoption** by creating positive social norms and ethical motivation.
4. Marketers should focus on **communicating value, environmental benefits, and product quality**, rather than relying solely on competitive pricing.

DISCUSSION AND CONCLUSION

Discussion

The present study examined the **price–value equation in consumer adoption of sustainable products**, integrating theoretical frameworks such as **Price–Value Trade-Off Theory, Theory of Planned Behavior (TPB), and Value–Belief–Norm (VBN) Theory**. The findings reveal several critical insights:

1. **Price Perception as a Barrier:**
 - Analysis shows that **price perception negatively influences adoption intention**. Consumers perceive sustainable products as expensive, which can limit their willingness to purchase.
 - This aligns with the **Price–Value Trade-Off Theory**, which emphasizes that higher perceived cost can reduce adoption unless counterbalanced by perceived benefits.
2. **Perceived Value as a Mediator:**
 - **Perceived value has a strong positive impact on adoption**, mediating the effect of price perception. Consumers evaluate sustainable products not just by cost, but by functional, emotional, and social benefits.
 - This confirms earlier studies (Chen, 2010; Biswas & Roy, 2015) that highlight perceived value as a key driver in green product adoption.
3. **Product Quality and Environmental Awareness:**
 - High product quality enhances perceived value, leading to higher adoption intention.
 - Environmental awareness positively influences adoption, indicating that **consumers with greater ecological concern are more likely to embrace sustainable products**, even at higher prices.
 - This aligns with the **Theory of Planned Behavior**, emphasizing that attitudes and awareness shape behavioral intention.
4. **Social Influence:**
 - Social norms and peer pressure moderately affect adoption. Consumers are influenced by family, friends, and social media, which creates **positive reinforcement for sustainable consumption**.
 - This is consistent with TPB and VBN theory, where social and moral norms shape sustainable behavior.
5. **Demographic Insights:**
 - Younger consumers (18–35 years) and middle-income groups show higher adoption rates, reflecting **greater environmental consciousness and openness to experimentation**.
 - Older consumers and lower-income groups are more price-sensitive, emphasizing the need for **affordable sustainable options**.
6. **Interplay of Price and Value:**
 - The study highlights that **perceived value mitigates the negative impact of higher price**. Consumers are willing to pay a premium if they perceive significant quality, ecological, or social benefits.
 - Marketers can leverage this by emphasizing **value communication** rather than merely competing on price.

CONCLUSION

The study confirms that consumer adoption of sustainable products is a **multifaceted phenomenon**, influenced by price perception, perceived value, product quality, environmental awareness, and social influence. The **price–value equation** is central: while higher prices pose a challenge, strong perceived value and quality can encourage adoption.

1. **Perceived value is the strongest predictor of adoption**, suggesting that businesses should focus on highlighting the benefits of sustainable products.
2. **Price perception negatively affects adoption**, but this can be mitigated by demonstrating functional, emotional, and social value.
3. **Product quality and environmental awareness** enhance adoption and satisfaction, supporting the integration of sustainability in product development and marketing strategies.
4. **Social influence** plays a supportive role, indicating that awareness campaigns and community engagement can strengthen sustainable consumption.
5. Adoption patterns vary across demographics, emphasizing the need for **targeted marketing strategies** for different consumer segments.

Managerial Implications

1. **Value Communication:** Marketers should emphasize **environmental benefits, quality, and ethical production** to enhance perceived value and justify premium pricing.
2. **Pricing Strategies:** Offering tiered pricing or discounts can attract **price-sensitive consumers** without compromising brand positioning.
3. **Product Quality Assurance:** Sustainable products should meet or exceed **performance expectations**, as quality is critical for satisfaction and repeat purchases.
4. **Awareness Campaigns:** Educating consumers about environmental impact and benefits of sustainable products can enhance adoption.
5. **Leveraging Social Influence:** Social media, influencer marketing, and community programs can reinforce adoption through **peer pressure and social validation**.

Policy Implications

1. **Incentives and Subsidies:** Policymakers can encourage sustainable consumption by offering **subsidies, tax benefits, or discounts** for eco-friendly products.
2. **Certification and Labelling:** Standardized eco-labels can increase **trust and perceived value**, reducing skepticism about product effectiveness.
3. **Public Awareness Programs:** Government and NGOs can run campaigns to **educate consumers**, highlighting the long-term environmental and social benefits of sustainable products.

Limitations and Future Research

- The study is limited to **Salem city**, which may not represent national or global adoption patterns.
- Data is based on **self-reported responses**, which may include social desirability bias.
- Future studies can use **larger, multi-city samples** or explore **online purchase behavior**.
- Longitudinal research can track **changes in adoption behavior over time**.

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