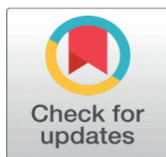


# ANALYSE FACTORS INFLUENCING CONSUMER PERCEPTION AND PURCHASE INTENTIONS FOR ELECTRIC VEHICLES IN THE INDIAN AUTOMOBILE INDUSTRY

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## ABSTRACT

The transition to electric vehicles (EVs) is emerging as a sustainable solution to address environmental degradation and rising fuel costs. This study examines the variables affecting consumers' perceptions of and intentions to buy electric vehicles in the Tamil Nadu auto industry. Data were gathered from people 20 years of age and older using standardised questionnaires, and ANOVA and multiple regression analysis were used for analysis. Environmental excitement, technical excitement, anxiety, social influence, social image, perceived benefits, performance expectancy, and conducive conditions are important factors taken into account. The results show that adoption intention is significantly shaped by social image, environmental concern, and performance expectations. Age and income, two demographic factors, did not, however, significantly alter perception. Policymakers and manufacturers can use the study's practical lessons to create strategies that raise awareness, improve infrastructure, and match marketing to changing customer demands. India can become a leader in green mobility and hasten the adoption of electric vehicles with calculated efforts.

**Keywords:** Electric Vehicles, Consumer Perception, Purchase Intention, Tamil Nadu, Green Mobility, Automobile Industry, Ev Adoption, Sustainable Transportation

## 1. INTRODUCTION

The Indian automobile industry is undergoing a transformation, fuelled by increased environmental concerns, rising fuel prices, technical breakthroughs, and shifting consumer preferences. One of the biggest trends is the growing popularity of electric cars (EVs), which are being marketed as a greener substitute for conventional internal combustion engine (ICE) automobiles. The adoption and promotion of electric mobility have gained national attention as a result of India's commitment to cut carbon emissions and switch to sustainable energy sources. Consumer perception is essential in the adoption of electric vehicles, particularly in a diversified and price-sensitive market like India. Consumer perceptions of EVs are influenced by government incentives, charging infrastructure, perceived cost-benefits, technological familiarity, environmental awareness, and brand trust.

Although the government and manufacturers are working to promote electric mobility, the Indian EV sector is still in its infancy. This necessitates learning more about the attitudes of consumers and what motivates or deters them from switching to electric cars. Automobile manufacturers, policymakers, and marketers must understand these behavioural determinants to develop effective strategies that increase consumer involvement, trust, and eventual acceptance. The

primary goal of this study is to examine the major determinants of consumer perception and intent to buy electric vehicles in the Indian auto sector. The results are expected to offer practical suggestions that will accelerate India's transition to a more environmentally conscious and sustainable transportation system. The study's overall goal is to promote environmentally friendly transportation and reduce vehicle pollution by investigating customer attitudes and purchasing intentions about electric vehicles in the Indian setting. It specifically aims to investigate how the intention to adopt electric vehicles is shaped by elements including environmental concern, technological enthusiasm, consumer fear, social image, social influence, perceived benefits, performance expectancy, and providing conditions. Furthermore, the study explores how customer anxiety is impacted by technology enthusiasm, perceived benefits, performance expectations, and enabling factors. Additionally examined is the connection between social influence and social image. Based on these findings, the study intends to suggest methods for raising Indian customers' understanding and improving their acceptance of electric vehicles, which would support the long-term expansion of the auto sector.

## 2. REVIEW OF LITERATURE

Sharma & Raghavan (2025) studied Indian consumers' hesitation to buy EVs due to doubts about performance and poor charging infrastructure. They found that social influence and perceived usefulness boost purchase intentions, while range anxiety and cost deter them. Awareness and better infrastructure are key to adoption.

Mehta & Kulkarni (2024) explored how technological excitement and environmental concern impact EV adoption in India's tier-2 cities. Environmental enthusiasm positively affects purchase intent, while anxiety about battery life lowers it. They suggest test drives and marketing to reduce fears.

Thomas & Iyer (2023) examined luxury car buyers in India, finding that EVs are seen as status symbols influenced by social image and innovation value. Concerns about service and model availability limit adoption; aspirational branding is recommended.

Banerjee & Nair (2023) highlighted that awareness of incentives and environmental benefits increases EV adoption in India, while misinformation about battery life and resale value lowers interest. They stress the need for education campaigns.

Deshmukh & Ali (2024) identified psychological barriers like performance anxiety and charging uncertainty among middle-income consumers. Trust and performance expectations encourage buying, while perceived risk discourages. They advise improving infrastructure and warranties.

## 3. RESEARCH METHODOLOGY

The survey had 137 respondents and was conducted in 16 different locations around South Tamil Nadu. To gather consumer opinions and purchase intentions regarding electric vehicles from individuals 20 years of age and older who are prospective purchasers in the Tamil Nadu auto industry, area sampling was employed. While secondary data was gathered from government reports, industry publications, and scholarly journals of electric vehicles and the Tamil Nadu auto industry, primary data was gathered using structured questionnaires.

### 3.1. FORMULATION OF HYPOTHESES

H1: Age influences consumer perception of electric vehicle adoption.

H2: Income influences consumer perception of electric vehicle adoption.

H3: Environmental enthusiasm, technology interest, anxiety, social factors, perceived benefits, performance expectations, and enabling conditions impact adoption intention.

### 3.2. DATA ANALYSIS AND INTERPRETATION

H1: Age influences consumer perception of electric vehicle adoption.

According to the ANOVA results, respondents' opinions regarding the adoption of electric vehicles do not differ significantly across age groups, since the significance value is more than 0.05 ( $p > 0.05$ ). According to the respondents'

perceptions, age has no statistically significant effect on their adoption of electric vehicles. Table 1 below displays the comprehensive ANOVA findings.

**Table 1** AGE-WISE ANOVA RESULTS

| Construct                | 20-30 yrs |      | 30-40 yrs |      | 40-50 yrs |      | 50-60 yrs |      | Above 60 yrs |      | ANOVA |          |
|--------------------------|-----------|------|-----------|------|-----------|------|-----------|------|--------------|------|-------|----------|
|                          | Mean      | S.D  | Mean      | S.D  | Mean      | S.D  | Mean      | S.D  | Mean         | S.D  | F     | Sig. (p) |
| Environmental Enthusiasm | 1.42      | 0.32 | 1.38      | 0.28 | 1.52      | 0.30 | 1.38      | 0.41 | 1.23         | 0.24 | 2.80  | 0.03     |
| Technological Enthusiasm | 2.27      | 0.68 | 2.47      | 0.87 | 2.50      | 0.61 | 2.62      | 0.82 | 2.48         | 0.93 | 0.59  | 0.71     |
| Anxiety                  | 2.42      | 0.74 | 2.40      | 0.64 | 2.33      | 0.56 | 2.50      | 0.62 | 2.47         | 0.63 | 0.38  | 0.84     |
| Social Image             | 1.81      | 0.61 | 1.58      | 0.42 | 2.07      | 0.65 | 1.72      | 0.61 | 1.71         | 0.61 | 3.00  | 0.02     |
| Social Influence         | 2.11      | 0.76 | 2.21      | 0.72 | 2.64      | 0.62 | 2.41      | 0.81 | 2.12         | 0.93 | 2.90  | 0.02     |
| Perceived Benefits       | 1.39      | 0.53 | 1.38      | 0.44 | 1.78      | 0.52 | 1.55      | 0.53 | 1.50         | 0.31 | 3.20  | 0.02     |
| Performance Expectancy   | 2.54      | 0.73 | 2.53      | 0.96 | 2.55      | 0.58 | 2.53      | 0.78 | 2.47         | 0.64 | 0.00  | 0.98     |
| Facilitating Conditions  | 1.84      | 0.65 | 1.64      | 0.45 | 2.25      | 0.81 | 1.98      | 0.55 | 1.84         | 0.63 | 3.80  | 0.01     |
| Adoption Intention       | 2.17      | 0.66 | 1.98      | 0.64 | 2.22      | 0.59 | 2.09      | 0.63 | 2.13         | 0.62 | 0.66  | 0.65     |

**Source** Primary data compiled from SPSS.

H2: Income influences consumer perception of electric vehicle adoption.

According to the findings of the ANOVA analysis, respondents' perceptions on the adoption of electric vehicles in Tamil Nadu across all income levels do not differ significantly. The significance values ( $p > 0.05$ ) for both technological and environmental enthusiasm, as displayed in Table 2, support this result. As a result, income level had no significant impact on consumer perceptions of electric car adoption among the study's respondents.

**Table 2** INCOME-WISE ANOVA RESULTS

| Construct                | ₹50,000-₹75,000 |      | ₹75,000-₹1,00,000 |      | ₹1,00,000-₹1,25,000 |      | Above ₹1,25,000 |      | ANOVA |         |
|--------------------------|-----------------|------|-------------------|------|---------------------|------|-----------------|------|-------|---------|
|                          | Mean            | S. D | Mean              | S. D | Mean                | S. D | Mean            | S. D | F     | Sig (p) |
| Environmental Enthusiasm | 1.43            | 0.34 | 1.43              | 0.28 | 1.44                | 0.33 | 1.23            | 0.36 | 1.27  | 0.28    |
| Technological Enthusiasm | 2.43            | 0.71 | 2.56              | 0.85 | 2.71                | 1.06 | 2.55            | 0.79 | 0.71  | 0.54    |
| Anxiety                  | 2.42            | 0.61 | 2.20              | 0.78 | 2.65                | 0.64 | 2.45            | 0.37 | 1.57  | 0.21    |
| Social Image             | 1.79            | 0.63 | 1.90              | 0.68 | 1.73                | 0.45 | 1.88            | 0.67 | 0.32  | 0.82    |
| Social Influence         | 2.28            | 0.75 | 2.57              | 0.70 | 2.33                | 0.77 | 2.70            | 0.53 | 1.80  | 0.14    |
| Perceived Benefits       | 1.53            | 0.53 | 1.55              | 0.57 | 1.67                | 0.56 | 1.59            | 0.44 | 0.36  | 0.77    |
| Performance Expectancy   | 2.55            | 0.71 | 2.40              | 0.71 | 2.43                | 0.78 | 2.76            | 0.49 | 0.72  | 0.53    |
| Facilitating Conditions  | 1.94            | 0.69 | 1.97              | 0.69 | 1.98                | 0.69 | 2.13            | 0.38 | 0.29  | 0.84    |
| Adoption Intention       | 2.05            | 0.62 | 2.23              | 0.59 | 2.26                | 0.68 | 2.36            | 0.55 | 1.49  | 0.23    |

**Source** Primary data compiled from SPSS

H3: Environmental enthusiasm, technology interest, anxiety, social factors, perceived benefits, performance expectations, and enabling conditions impact adoption intention.

The multiple regression study in Tamil Nadu found a statistically significant model with an F-value of 8.519 ( $p < 0.05$ ), showing that the predictor variables jointly influence adoption intention. The independent variables in the model can account for about 34.7% of the variation in adoption intention, according to the R value of 0.589 and the R<sup>2</sup> value of 0.347.

**Table 3** MULTIPLE REGRESSION ANALYSIS

| Predictor                | B     | Beta ( $\beta$ ) | Sig. (p) |
|--------------------------|-------|------------------|----------|
| Constant                 | 1.07  | -                | 0.00     |
| Environmental Enthusiasm | 0.09  | 0.04             | 0.58     |
| Technological Enthusiasm | 0.02  | 0.03             | 0.79     |
| Anxiety                  | -0.19 | -0.18            | 0.02     |
| Social Image             | 0.35  | 0.34             | 0.00     |
| Social Influence         | 0.07  | 0.08             | 0.35     |
| Perceived Benefits       | -0.00 | -0.00            | 0.98     |

|                                |       |       |      |
|--------------------------------|-------|-------|------|
| <b>Performance Expectancy</b>  | 0.21  | 0.24  | 0.01 |
| <b>Facilitating Conditions</b> | -0.00 | -0.00 | 0.96 |

**Source** Primary data compiled from SPSS.

#### 4. MAJOR FINDINGS

The study reveals several key insights into consumer perception and purchase intentions for electric vehicles in Tamil Nadu:

**Age-Based Perception Differences:** It has been identified that perceptions were highly influenced by projected benefits, social influence, environmental enthusiasm, social image, and facilitating circumstances. This implies that those who are younger and more concerned about the environment are more likely to embrace electric vehicles. To increase ecological consciousness and the social identity of their customers, manufacturers should highlight the advantages of the environment and encourage a green lifestyle.

**Policy Implication:** Government interventions—such as financial subsidies, reduced registration and road taxes, and toll exemptions—can further incentivize adoption across age groups.

**Income-Based Perception:** The study revealed no significant differences in perception according to income level. Nevertheless, it is advised that automakers create electric cars that are suited to different economic brackets. Additionally, they ought to concentrate on auxiliary infrastructure like:

- Sufficient charging stations
- Competitive performance and mileage
- Reasonably priced operating and maintenance expenses

**Adoption Intention Influencing Factors:** Adoption intention is positively affected by social influence, environmental passion, technical enthusiasm, and social image. Consequently:

To appeal to tech-savvy consumers, marketing campaigns should emphasise the originality, distinctiveness, and modernity of electric vehicles. In order to draw in eco-aware consumers, marketing initiatives should prioritise environmental benefits. Adoption can be further boosted by creating a strong social identity around EV use, positioning it as a mark of advancement, responsibility, and status. All things considered, regulatory assistance and focused marketing are essential to increasing the uptake of electric vehicles in Tamil Nadu.

#### 5. FUTURE SCOPE OF THE STUDY

According to this research, the two most important elements influencing how consumers see the adoption of electric cars (EVs) are social image and performance expectations. It's interesting to note that factors like technological enthusiasm, perceived benefits, performance expectations, or enabling conditions don't seem to have a substantial impact on worry over EV adoption. However, attitudes and perceptions of EVs are significantly shaped by societal impact.

Given these results, it is suggested that EV producers make investments to improve EVs' technological capabilities as well as the social standing that comes with having one. Concerns about rising crude oil prices, the harmful health effects of carbon emissions, the depletion of fossil fuel supplies, and other environmental issues have prompted the study to call for a gradual switch from conventional fuel-based vehicles to more ecologically friendly alternatives. This change is becoming more evident in developing nations like India, even if it is already noticeable in wealthy nations. India has the potential to have a sharp increase in EV adoption due to its youthful population and growing middle-class wages. Therefore, to establish a conducive ecosystem for EV growth, cooperation between automakers, legislators, and environmental advocates is crucial. India is in a strong position to dominate the world in electric vehicle-powered shared mobility solutions by 2030. Understanding consumer buying intentions is becoming more and more important as large international competitors enter the Indian EV industry. For marketers and automakers looking to adapt their strategies to changing consumer expectations, this research offers insightful information.

## 6. CONCLUSION

According to the research findings, social influence, environmental passion, performance expectations, and social image are the main factors influencing Tamil Nadu consumers' adoption of electric vehicles. Adoption intention is mainly shaped by psychological and social factors, while demographic characteristics like age and income have little effect on perception. According to the analysis, people are more likely to choose EVs when they believe they offer performance advantages and social value. While government programs can encourage this change through subsidies and infrastructure development, manufacturers should concentrate on improving the technological appeal and social identity of EVs. Tamil Nadu has the ability to make a major contribution to India's larger EV revolution with supportive regulations and growing environmental awareness. In order to hasten the adoption of electric vehicles, the study emphasises the significance of consumer education, enhanced accessibility, and focused promotions.

## CONFLICT OF INTERESTS

None.

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