# A Study of Financial Factors Affecting Adaptation to Buyer Behaviour and Preferences of Electric Vehicle

**Pranali S. Khandar**
Student
Department of Business Administration (MBA) SIPNA College of Engineering & Technology, Amravati
pranalikhandar68@gmail.com

**Dr.M.D.Jadhav**
Professor and Head MBA Department.
Sipna College of Engineering and Technology,
Amravati 444607
Amravati (MS.), India
manish_pari78@rediffmail.com

**Abstract**

Electric vehicles (EVs) are becoming popular due to rising fuel prices, environmental concerns, and government support. Even though many people are aware of electric vehicles, the actual number of buyers is still limited. This study aims to understand the financial factors that affect buyer behaviour and preferences towards electric vehicles.The study is based on primary data collected through a questionnaire from respondents, along with secondary data from books, journals, and reports.The electric vehicles in Amravati city is fairly high, high initial cost and limited charging infrastructure are major challenges. Government incentives, lower running costs, and affordable EMI options positively influence buyer decisions. The objectives to the study the level of awareness of buyers regarding electric vehicles.The study concludes that improved financial support and infrastructure development can increase electric vehicle adoption in Amravati city. The research design used in this study is descriptive in nature, as it aims to describe and analyze the financial factors influencing buyer behaviour and preferences towards electric vehicles.

**Keywords**

Electric Vehicles, Buyer Behaviour, Financial Factors, Government Subsidies, Running Cost, EMI Affordability, Amravati City.

**Intoduction**

The automobile industry is undergoing a major transformation driven by technological innovation, environmental concerns, and policy reforms. Rising fuel prices, increasing environmental pollution, and growing awareness about sustainable transportation have increased interest in electric vehicles across India. The government is also promoting EV adoption through various subsidies, tax benefits, and policy initiatives. Despite these efforts, the adoption rate of electric vehicles is still relatively low in many cities.

In a developing city like Amravati, buyer behaviour towards electric vehicles is influenced by several factors, especially financial considerations. The high initial purchase price, cost of charging, availability of charging infrastructure, and affordability of loan and EMI options play a crucial role in the purchase decision. At the same time, lower running and maintenance costs make electric vehicles an attractive alternative to conventional petrol and diesel vehicles.

Understanding buyer preferences and financial challenges is important for increasing EV adoption at the city level. This study focuses on analyzing the financial factors affecting buyer behaviour and preferences towards electric vehicles in Amravati city. The findings of this study will help policymakers, vehicle manufacturers, and financial institutions to design better strategies for promoting electric vehicle adoption in the region.

**Review of Literature**

The review of literature provides an overview of previous studies and theoretical insights related to financial factors influencing consumer behaviour toward electric vehicles (EVs). It helps to identify the research gaps and establish the conceptual foundation for the present study conducted in Amravati city of Maharashtra.

1. Singh and Verma (2019) studied consumer perception towards electric vehicles in India and found that high initial purchase cost is the main barrier to EV adoption. Their study also highlighted that government subsidies and tax incentives positively influence purchase intention.
2. Kumar et al. (2020) examined the role of operating and maintenance costs in electric vehicle adoption. The study concluded that lower running and maintenance costs increase the long-term value perception of electric vehicles, encouraging buyers to consider EVs despite higher upfront costs.
3. Sharma and Gupta (2021) analyzed the impact of government policies on EV adoption in urban areas. Their findings showed that financial incentives, reduced registration fees, and tax benefits significantly improve buyer interest, but lack of awareness about these schemes limits their effectiveness.
4. Patil (2022) conducted a regional study on electric vehicle adoption in Maharashtra and observed that limited charging infrastructure and financing options negatively affect buyer preference in semi-urban cities.
5. Bansal, P., Kumar, R. R., Raj, A., Dubey, S., & Graham, D. J. (2021).

Willingness to pay and attitudinal preferences of Indian consumers for electric vehicles. Energy Economics.Using stated-preference data from >1,000 Indian consumers and a hybrid choice model, this paper provides the first robust WTP (willingness-to-pay) estimates for EV attributes in India — e.g., consumers will pay more for reduced charging time, longer range and lower operating cost. It shows financial attributes (operating cost savings, charging time) strongly affect purchase decisions and that heterogeneity of attitudes matters for pricing and subsidy policy design.

6. NITI Aayog & Rocky Mountain Institute (RMI). (2019).

7. India's Electric Mobility Transformation: Progress, Challenges and Opportunities. (Policy/analytical report)National-level roadmap estimating EV penetration scenarios, quantifying potential energy and $CO_2$ savings and arguing that financial incentives (demand incentives, PLI for batteries) and TCO improvements are central .

8. Singer, M. (NREL). (2016)

Consumer views on plug-in electric vehicles: National benchmark report. National Renewable Energy Laboratory (NREL) Report. U.S. national survey documenting consumer awareness and willingness to pay, showing that many consumers require substantial range or financial incentives to consider EVs; useful benchmark for TCO and incentive design.

**Problem Definition**

Electric vehicles (EVs) are promoted as a sustainable and cost-effective alternative to conventional petrol and diesel vehicles. Despite increasing awareness, government support, and rising fuel prices, the adoption of electric vehicles in Amravati city remains limited. Many potential buyers show interest in EVs but hesitate to make the final purchase decision.

The major problem lies - the financial concerns of buyers, such as high initial purchase cost, uncertainty about charging expenses, lack of awareness about government subsidies, and limited availability of affordable loan and EMI options. In addition, insufficient charging infrastructure further increases perceived financial risk among buyers.

While several studies have been conducted on electric vehicle adoption at the national and metropolitan level, limited research is available at the city level, especially for developing cities like Amravati. Therefore, there is a need to understand how financial factors influence buyer behaviour and preferences towards electric vehicles in Amravati city.

This study attempts to identify and analyze these financial challenges in order to provide useful insights for policymakers, manufacturers, and financial institutions to improve electric vehicle adoption.

**Objectives of the study**

1. To identify the major financial determinants (such as price, subsidies, financing options, and maintenance costs) influencing the decision to purchase an electric vehicle.
2. To study the awareness level of consumers in Amravati city regarding government incentives, tax benefits, and financial support for EVs.

3. To analyze the relationship between income level and the willingness to invest in electric vehicles.
4. To evaluate consumer perceptions of long-term cost savings and return on investment associated with EV ownership.
5. To assess the financial barriers and challenges that prevent potential buyers from adopting electric vehicles in Amravati.

**Research Methodology**

Research Design: Descriptive and analytical. Sources of data:
Primary Data: Collected through a structured questionnaire distributed to respondents in Amravati city.

Secondary Data:

Collected from journals, research papers, government reports (such as FAME India scheme), books, websites, and articles related to electric vehicles and consumer behaviour.

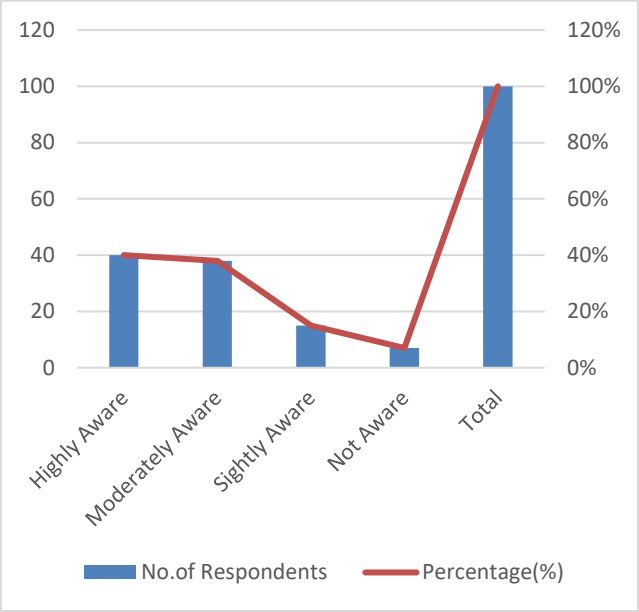
Tools: Demographic Profile of respondents , Financial Factors and Preferences, including questions about cost, subsidies, financing, maintenance, and perceived savings.
Sample Design.

**Data Analysis and Interpretation**

Table 1. Distribution of Respondents According to Awareness Level about Electric Vehicles

| **Awareness Level** | **No.of Respondents** | **Percentage( %)** |
|---|---|---|
| Highly Aware | 40 | 40% |
| Moderately Aware | 38 | 38% |
| Sightly Aware | 15 | 15% |
| Not Aware | 7 | 7% |
| **Total** | 100 | 100% |

Graph 1. Distribution of Respondents According to Awareness Level about Electric Vehicles




**Findings**

The table shows that 40% of the respondents are highly aware of electric vehicles, while 38% are moderately aware. About 15% of the respondents are slightly aware, and only 7% are not aware. Overall, the majority of respondents (78%) possess high to moderate awareness regarding electric vehicles.

**Interpretation**

The findings indicate a high level of awareness about electric vehicles among respondents, suggesting effective dissemination of information. However, a small proportion of respondents still lack adequate awareness. This highlights the need for targeted awareness campaigns to educate less informed groups and promote wider acceptance of electric vehicles.

**Hypothesis Testing**

**Hypotheses**

$H_0$ (Null Hypothesis): There is no significant relationship between the purchase price and buyer preference for electric vehicles.
$H_1$ (Alternative Hypothesis): There is a significant relationship between the purchase price and buyer preference for electric vehicles.

Observed Frequencies (O)

| Awareness Level | No. of Respondents |
|---|---|
| Highly Aware | 40 |
| Moderately Aware | 38 |
| Slightly Aware | 15 |

| | |
|---|---|
| Not Aware | 7 |
| Total | 100 |

Expected Frequencies (E)
Since there are 4 categories:
E = 100 / 4 = 25

Calculation of Chi-Square ($\chi^2$)
$\chi^2 = \Sigma (O - E)^2 / E$

| Category | O | E | $(O-E)^2 / E$ |
|---|---|---|---|
| Highly Aware | 40 | 25 | 9.00 |
| Moderately Aware | 38 | 25 | 6.76 |
| Slightly Aware | 15 | 25 | 4.00 |
| Not Aware | 7 | 25 | 12.96 |

Calculated $\chi^2 = 32.72$

Degrees of Freedom (df)
$df = n - 1 = 4 - 1 = 3$

Table Value (At 5% Level of Significance)
$\chi^2_{0.05}$ (df = 3) = 7.815

Since Calculated $\chi^2$ (32.72) > Table $\chi^2$ (7.815), the Null Hypothesis ($H_0$) is rejected.

The calculated Chi-square value (32.72) is significantly higher than the table value (7.815) at the 5% level. This indicates that the observed variation in awareness levels among respondents is statistically significant.

The results reveal that respondents differ significantly in their awareness levels, with a majority being highly or moderately aware. This suggests that awareness initiatives have been effective but further efforts are needed to improve awareness among less informed groups.

**Finding and Discussion**

The present study was conducted to understand the financial factors affecting buyer behaviour and preferences towards electric vehicles in Amravati city. Based on the analysis of primary data collected from respondents, the following findings and discussions are presented.
The study reveals that awareness about electric vehicles among respondents in Amravati city is relatively high, especially among the younger age group of 25–40 years. This indicates growing interest and knowledge about EVs; however, awareness alone does not ensure adoption.
One of the major findings of the study is that the high initial purchase price of electric vehicles acts as a significant barrier to their adoption. Most respondents feel that EVs are expensive compared to conventional vehicles, which affects their buying decision despite long-term cost benefits.

**Conclusion:**

The findings show that high initial purchase cost is the major factor discouraging buyers from purchasing electric vehicles. However, lower running and maintenance costs, availability of government subsidies, and affordable EMI options positively influence buyer preferences. The study also highlights that concerns related to charging infrastructure and charging time continue to affect purchase decisions.
Overall, the research confirms that financial factors play a crucial role in shaping buyer behaviour towards electric vehicles in Amravati city. Reducing the upfront cost, improving financial support, and expanding charging infrastructure can significantly increase the adoption of electric vehicles. The study concludes that coordinated efforts by the government, manufacturers, and financial institutions are essential to promote electric vehicle usage and support sustainable transportation in Amravati city.

**Suggestions**

1. Reduction in Initial Cost:

Electric vehicle manufacturers should focus on reducing the initial purchase price by introducing affordable models suitable for middle-income buyers in Amravati city.

2. Improved Government Subsidies:

Government authorities should continue and strengthen subsidy schemes and ensure that buyers are properly informed about available financial incentives.

3. Better Charging Infrastructure:

More public charging stations should be installed in residential areas, commercial zones, and highways to reduce range anxiety among buyers.

4. Easy Loan and EMI Facilities:

Banks and financial institutions should provide low-interest loans and flexible EMI options to encourage buyers to choose electric vehicles.

5. Awareness Programs:

Awareness campaigns should be conducted to educate consumers about the long-term financial benefits of electric vehicles, such as low running and maintenance costs.

6. Private Sector Participation:

Private companies should be encouraged to invest in charging infrastructure and EV-related services through public–private partnerships.

**Limitation of the study**

1. The study is limited to Amravati city, and therefore the findings cannot be generalized to other cities or regions.
2. The research is based on a limited sample size, which may not fully represent the opinions of the entire population of Amravati city.
3. The study relies mainly on primary data collected through questionnaires, and responses may be affected by personal bias or inaccurate information provided by respondents.
4. Only selected financial factors such as purchase price, subsidies, running cost, and EMI facilities were considered; other factors like technology, brand image, and environmental attitudes were not included in detail.
5. The time available for conducting the study was limited, which restricted deeper analysis.
6. The study used simple statistical tools, and advanced techniques were not applied.

**Scope for Future Research**

The present study focuses on the financial factors influencing buyer behaviour towards electric vehicles in Amravati city. Future research can expand the scope of this study in several ways.

- Future studies can be conducted in other cities, rural areas, or at the state and national level to compare buyer behaviour across different regions.
- A larger sample size can be used to obtain more accurate and generalized results.
- Future researchers can include non-financial factors such as environmental awareness, technological features, brand image, and social influence.
- Advanced statistical tools such as regression analysis, factor analysis, or structural equation modeling can be applied for deeper insights.
- A comparative study between electric vehicles and conventional petrol/diesel vehicles can be conducted to understand changing consumer preferences.
- Longitudinal studies can be undertaken to analyze changes in buyer behaviour over time as EV infrastructure improves

**Reference**

1. Singh, R., & Verma, A. (2019). Consumer perception and attitude towards electric vehicles in India. International Journal of Engineering and Management Research, 9(4), 30–36.
2. Kumar, S., Jain, A., & Gupta, R. (2020). Factors influencing the adoption of electric vehicles in India. Journal of Cleaner Production, 265, 121–134. https://doi.org/10.1016/j.jclepro.2020.121134
3. Sharma, P., & Gupta, S. (2021). Impact of government policies on electric vehicle adoption in urban India. International Journal of Business and Management, 16(3), 45– 54.
4. Patil, M. (2022). Challenges and opportunities of electric vehicle adoption in Maharashtra. Indian Journal of Transport Management, 46(2), 78–85.
5. Ministry of Heavy Industries, Government of India. (2023). FAME India Scheme – Phase II. Government of India.
6. NITI Aayog. (2022). Electric mobility and battery storage in India. Government of India.
7. International Energy Agency. (2023). Global EV outlook 2023. IEA Publications.
8. Kotler, P., & Keller, K. L. (2016). Marketing management (15th ed.). Pearson Education.