



## Willingness to Purchase Electric Two Wheelers in Coimbatore District of Tamil Nadu

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### Authors' contributions

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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### ABSTRACT

The low-speed category has seen negative growth in the past two quarters of 2021. The market share of the low-speed sector used to be upwards of 70 percent in all the previous years, and that has plummeted to less than 15 percent in the last quarter of October-December 2021. The low-speed electric two-wheelers are not subsidised under the FAME II programme that promotes only high-speed motorcycles depending on their battery capacity at Rs 15,000 kwh, which has made the entry-level high-speed electric two-wheelers cheaper than many of the low-speed ones. The electric two-wheeler market is classified into three divisions, low-speed, city-speed, and high-speed. While the low-speed category is dying away, the city speed segment (up to 50 km/h) is gaining popularity due to competitive price and lower replacement costs of batteries. Adoption in the high-speed sector, i.e. 70 km/h, is limited but may rise in the next several years as the battery prices come down. "We haven't seen better days than the previous few months in the whole EV adventure. In the previous 15 years, we together sold roughly 1 million e2w, e-three wheelers, e-cars, and e-buses, and we will most likely sell the same 1 million units in only one year beginning January 22. The latest good developments in EV policy under FAME 2 are a game-changer.

**Aim:** The aim of the study was to examine the willing to purchase decision of respondents about electric two wheelers.

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**Methods:** Primary data has been collected from 120 respondents through interview using well-structured questionnaire from Coimbatore district of Tamil Nadu. Probit analysis was used to know the clear picture about major influencing variable used as a deciding factor for purchase of electric two wheelers.

**Findings:** The conclusion of this study was age, gender, monthly income, place of residence, source of information were influencing the willing to purchase decision of respondent about electric two wheelers. Electric two wheeler are protecting the global from global warming.

**Interpretation:** From the study the respondents are shifting to battery based vehicles or bikes because some of respondents are concerns about environmental issue and society are stating that the COVID-19 pandemic has heightened awareness and concern about environmental issues.

*Keywords: Electric two wheeler; willingness to purchase; environmental issue; buying behaviour; consumer perception.*

## 1. INTRODUCTION

Environmental concerns are encouraging the industry and marketing of electric vehicles. The year 2018 transformed Indian manufacturers' perceptions of electric vehicles as preferable alternatives to fuel vehicles (typical diesel/petrol combustion engines). Nissan Motors, for example, is developing 20 new EV models, and various Indian domestic players such as Tata Motors, Mahindra & Mahindra, TVS Motors, and Bajaj Auto are attempting to strongly leverage the high growth period of electric vehicles into their strategic competitive advantages in the market. This new developing market has resulted in a number of strategic agreements (Tata Motors with Fiat, M&M with Ford and Renault, Bajaj Auto with Kawasaki, and TVS with Suzuki, Jaguar Land Rover by Tata Motors, BMW and KTM by Bajaj Auto). The combination of an Indian skilled and semi-skilled technological base, a large customer base, and relatively lower production and labor costs has incentivized almost all global electric vehicle manufacturers and component suppliers to launch operations in India Bosch, AVL, and Cummins are a few examples and the result would give a boost to infrastructure development. To investigate the commercial success and purchase intentions of full electric cars among Indians, it is necessary to investigate the elements affecting customer acceptance of these vehicles [1-3]. Situational elements such as regulatory environment, personal present psychological aspects such as attitude, perception, and societal acceptance and consideration levels are all factors that impact automobile customers' buying decisions. "Although some empirical studies on hybrid car consumer acceptability have been undertaken, there is little study that analyzes the perception

of a predicted scenario; in particular, there has been little emphasis paid to the perception of full electric vehicles." From an environmental standpoint, with rising CO<sub>2</sub>-emissions and the depletion of fossil fuels, the adoption of electric vehicles may be seen as a precautionary step and a source of future security [4-6]. The technology that will be employed in the next EV is quite sophisticated and on the rise, allowing for long-distance coverage while being efficient and comfortable. Recent study has looked at the possibility of electric mobility from a technological, economic, logistic, environmental and dinner-urban standpoint. However, study revealed that electric cars have significant challenges in creating adequate markets, at least in terms of Public Perception and Acceptance of Electric Vehicles in India. Changing the trend from fuel vehicles to EVs requires tremendous propagation and confidence building in the electric vehicle category [7-10]. However, there is still a strong negative attitude toward EV acceptance The first factor that may be a big deterrent to embracing EVs is the experience, comfort, safety, and dependability of conventional fuel vehicles. And the second Indian notion is to minimize risk and uncertainty while adopting new technologies. The third societal motive emerges [11-14]. The electric vehicle industry has been on a course to a favourable rise and the year 2021 witnessed strong sales, notably in the electric two-wheeler category in India. The overall sales of electric two-wheelers, including high-speed and low-speed, in the 12-month period (January-December) in 2021 climbed by 132 percent over the comparable year 2020. The industry recorded sales of 2,33,971 units as compared 1,00,736 units sold in 2020. The high-speed electric two-wheelers, which have speeds more

than 25 km/h and need a complete licence, reported a stunning 425 percent rise, while the low-speed ones (less than 25 km/h, no licence, no registration) climbed only by 24 percent.

### 1.1 Objectives

To study the willingness to pay for buying electric two wheeler.

## 2. MATERIALS AND METHODS

Primary data has been collected from 120 respondents through online interview using well-structured questionnaire. The survey was carried out in Coimbatore district of Tamil Nadu. Probit model is a statistical probability model and it based on cumulative normal probability distribution which contain binary dependent variable is the value of zero and one. The Probit analysis provides the statistically significant findings which shows the demographic variables increase or decrease the probability of willingness.

The general Probit model is expressed as follows:

$$P_i = Z_i\gamma + \mu_i$$

Where,

- $P_i$ = dependent variable
- $Z_i$  = independent variables,
- $\mu_i$ = the stochastic error term.

Description of dependent and independent variables, mean and standard deviation were given in Table 1.

From Table 1, it shows the descriptive statistics, of dependent variable and independent variables were presented. For analyzing respondent's willing to purchase of electric two wheeler, as a dependent variable was "willing to purchase" it denoted as "1", and "non willing to purchase" denoted as "0". Independent variables mentioned as Demographic variable such as namely age, gender, monthly income and place of residence these demographic variables using continuous data.

**Table 1. Description of the variables**

Variables	Description of the variable	Mean	Standard Deviation
<b>Dependent variable</b>			
Willing to purchase	'1' if the respondent willing to purchase of electric two wheeler '0' if the respondent not willing to purchase of electric two wheeler	0.82	0.38
<b>Independent variable</b>			
Age ( $X_1$ )	'1' if the respondent is Less than 20 '2' if the respondent is Between 30 to 40 '3' if the respondent is Above 40	45.42	14.85
Gender ( $X_2$ )	'1' for male ;'0' for female	0.84	0.42
Monthly income ( $X_3$ )	'1' if the respondent monthly income is Less than Rs.40,000 '2' if the respondent monthly income is Rs.60,000 to Rs.80,000 '3' if the respondent monthly income is Above Rs.80,000	7.73	4.50
Place of residence ( $X_4$ )	'1' if the respondent Place of residence in City corporation '2' if the respondent Place of residence in Municipality '3' if the respondent Place of residence in Rural	3.02	1.9

**Table 2. Description of variables using Probit model**

<b>Variab</b> les	<b>Co efficient</b>	<b>p value</b>	<b>Marginal effect</b>
Constant	0.246	0.002	
Age	0.019	0.477	0.4322
Gender	-0.093	0.462	-0.0578
Monthly income	0.618	0.105*	0.7511
Place of residence	0.194	0.003***	0.1543

Number of observation : 120 ; Likelihood Ratio Chi-Square : 45.572;  
 LR chi square: 43.32; Pro>chi : 0.0102; Pseudo R square: 0.5684  
 (\*\*1% significant, \*10% significant)

**3. RESULTS AND DISCUSSION**

Farmer’s Willingness to purchase decision about crop insurance was calculated through Probit model and its co efficient relationship, significant p value and marginal effect were illustrated in Table 2.

$$WTP_{ci} = \text{constant (0.246)} + \text{age (0.019)} + \text{gender (0.093)} + \text{monthly income (0.618)} + \text{place of residence (0.194)}.$$

From Table 2, it could be concluded that total number of observation was 120. likelihood chi square ratio was -45.572, LR chi square value 43.32, pro>chi value was 0.0102 it shows the significant relation and this model fit to this study and pseudo R square value was 0.5684. Place of residence is significant at 1% level of significance and Monthly income is significant at 10% level of significance.

**4. FINDINGS AND CONCLUSION**

In this study area among demographic variable gender variable negatively significant with willing to purchase decision of electric two wheeler which means one point increase of this variable would decrease the same point of willing to purchase decision of electric two wheeler and other variables viz., age, monthly income, Place of residence are positively significant with willing to purchase decision of electric two wheeler which means one point increase of this variable would increase the same point of willing to purchase decision of electric two wheeler.

Age of the sample respondents had positive coefficient (0.019) which means this positive sign revealed that respondents age increase with increase the probability of willing to purchase decision about electric two wheeler by 0.432 per cent points but insignificant (p value 0.477) with willing to purchase decision about electric two

wheeler, it shows that demographic character age not influencing the purchasing decision of electric two wheeler hence null hypothesis (H<sub>0</sub>) was accepted. It could be inferred that, in this study area respondents were more willing to purchase of electric two wheeler. Gender indicate negative coefficient (-0.093) and insignificant (p value 0.462), it shown that demographic character gender not influence the willingness decision for the electric two wheeler. Hence, null hypothesis (H<sub>0</sub>) was accepted.

Monthly income of the respondents shown that positive coefficient (0.618), this positive sign shown that monthly income increase with increase in probability of willing to purchase decision of electric two wheeler by 0.751 per cent points and significant (p value 0.105), it shows that monthly income factor highly influencing the willing to purchase decision of electric two wheeler. Hence, null hypothesis (H<sub>0</sub>) was rejected.

Place of residence is also a positive coefficient (0.194), this positive sign shown that land holding increase with willing to purchase decision of electric two wheeler will increase by 0.154 per cent. And place of residence is highly significant (p value 0.003) it shows that place of residence mostly influencing the willing to purchase decision of electric two wheeler, Hence, null hypothesis (H<sub>0</sub>) was rejected.

**DISCLAIMER**

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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