

Economic Determinants and Perceptions Influencing Electric Two-Wheeler Adoption

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ABSTRACT

The study examines the occupational differences in perceptions, motivations, policy preferences and economic considerations influencing the adoption of electric two-wheelers in Vijayawada city of Andhra Pradesh. Based on primary data collected from 180 respondents, comprising 90 salaried employees and 90 self-employed individuals, the study employs a descriptive research design and simple percentage analysis for interpretation. The findings reveal that social influence and cost savings are the major drivers of adoption, while respondents strongly perceive electric two-wheelers as more economical over a five-year period compared to petrol scooters. Policy measures such as higher exchange or scrappage value are identified as the most effective incentive for encouraging adoption. The study also highlights that home charging is considered the most cost-effective option, although infrastructural and installation-related concerns persist, particularly among salaried employees. At the household level, EV adoption is largely associated with increased disposable income and improved mobility flexibility. However, high battery replacement cost remains the most significant financial concern across both occupational groups. The study concludes that while electric two-wheelers are widely perceived as economically beneficial, addressing infrastructure limitations and post-purchase cost uncertainties is essential for accelerating adoption.

Keywords: Electric two-wheelers, occupational analysis, consumer perception,

The transition towards electric mobility has emerged as one of the most significant developments in the global transport sector, driven by concerns over fossil fuel dependence, rising urban pollution and the need for sustainable energy use. Among various segments of electric mobility, electric two-wheelers have gained considerable importance due to their affordability, ease of use and suitability for densely populated urban environments. Over the years, technological advancements in lithium-ion batteries, improvements in charging infrastructure and supportive policy frameworks have contributed to the steady evolution of electric two-wheelers from niche products to mainstream mobility solutions.

At the global level, the adoption of electric two-wheelers has been particularly strong in countries such as China, which dominates the market, followed by increasing penetration in European countries and parts of Southeast Asia. Governments across the world are actively promoting electric mobility through subsidies, tax incentives, emission regulations and investments in charging infrastructure. The global push towards net-zero emissions and climate change mitigation has further accelerated the shift from internal combustion engine vehicles to electric alternatives, especially in the urban transport segment. In the Indian context, the evolution of electric two-wheelers has been rapid in recent years, supported by policy initiatives such as the FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) schemes and various state-level incentives. India, being one of the largest two-wheeler markets in the world, presents a significant opportunity for electric mobility expansion. The increasing cost of petrol, rising environmental awareness and growing availability of affordable electric models have contributed to a noticeable shift in consumer interest. However, challenges such as charging infrastructure limitations, battery replacement costs and concerns regarding range and reliability continue to influence adoption behaviour.

In developing economies like India, vehicle ownership whether two-wheelers or four-wheelers is often regarded as a symbol of social status. This aspiration is further strengthened by limited efficiency in public transportation systems and rising income levels. In such circumstances, two-wheelers typically represent the initial transition from public transport dependence to private motorised mobility. They are particularly suited to low- and middle-income households due to their affordability in terms of both purchase price and running costs, as well as their convenience in daily commuting. Generally, two-wheeler ownership increases with household income up to a certain level, after which households tend to upgrade to four-wheelers. Research also indicates that vehicle ownership is influenced by several other factors such as population density, socio-demographic characteristics, household composition and travel behaviour patterns. Higher population density is positively associated with two-wheeler ownership, as they are easier to manoeuvre in congested urban spaces and require less parking space. Household structure also plays a crucial role, where larger families and a greater number of working members increase the likelihood of vehicle ownership. However, with an increase in the number of earners, households are more likely to shift towards four-wheelers due to higher combined income. The presence of children in a household tends to reduce preference for two-wheelers due to safety considerations. Additionally, higher daily travel distances are often associated with increased two-wheeler ownership because of their fuel efficiency. These observations indicate that the determinants of two-wheeler ownership differ significantly from those influencing four-wheeler ownership, highlighting the need for separate examination of adoption factors for electric two-wheelers (Furqan A. Bhat and Ashish Verma, 2024).

Another important determinant of electric vehicle adoption is the availability of charging infrastructure. Unlike internal combustion engine vehicles that can be refuelled quickly at widespread fuel stations, electric vehicles depend on dedicated charging facilities. Consumers without access to home charging often face inconvenience due to limited public charging availability, which contributes to range anxiety and increases perceived operational costs. In addition, fluctuations in electricity pricing, variations in government incentives and concerns regarding battery lifespan further complicate the overall cost-benefit evaluation of electric vehicle ownership (Uma Maheswari, 2025).

Electric bicycles and similar micro-mobility solutions have also gained popularity among environmentally conscious users as they provide a cleaner alternative to conventional fuel-based transport. These vehicles offer an eco-friendly commuting option that reduces environmental impact while maintaining convenience for daily travel. With increasing emphasis on sustainable mobility, electric bicycles are emerging as a practical solution for reducing carbon emissions. They enable users in both urban and rural settings to travel efficiently while experiencing improved mobility freedom (Kalimuthu and Vekashine, 2025).

Review of Literature

Yadav (2020) analysed the adoption of electric bike shared mobility services in India among young consumers. The study found that environmental concern and perceived usefulness positively influence adoption, with most users preferring short to medium distance travel up to 30 km. However, operational and service issues remain key challenges, indicating the need for improved service quality and targeted promotion to enhance adoption.

Natarajan et al. (2022) examined factors influencing electric two-wheeler market transformation in India. The study identified inadequate charging infrastructure and long charging time as major barriers, while consumers preferred higher range, fuel economy and smart features. It recommends ecosystem improvements, financial support and better consumer information to accelerate adoption.

Ali and Deshmukh (2023) studied consumer perception of electric vehicles in Sangli city. The findings show that environmental awareness, cost savings and lower emissions encourage adoption, especially among younger consumers. However, high purchase cost, poor charging infrastructure, limited models and safety concerns restrict adoption, highlighting the need for subsidies and price reduction.

Kumar and Madhiyarasi (2024) analysed consumer preferences for electric two-wheelers in Chennai. The study found that battery performance, cost savings, environmental benefits and incentives are key factors influencing adoption. It also highlights that improvements in affordability, charging infrastructure and performance are essential for wider acceptance.

Bhat and Verma (2024) studied electric two-wheeler adoption using discrete choice analysis in Bengaluru. The results show that purchase price, operating cost and charging time negatively affect adoption, while driving range and charging network availability positively influence it. Policy support and environmental attitude also play a significant role in shaping consumer decisions.

Kulkarni et al. (2024) examined EV adoption using the Technology Acceptance Model. The study identified environmental awareness, cost efficiency, battery technology and government support as major drivers. It also found a gap between positive attitude and actual purchase behaviour due to external constraints such as infrastructure limitations.

Pratyush and Krishna Kishore (2024) analysed adoption factors in tier-1 cities. The study found that infrastructure, economic factors and technology significantly influence adoption, while income also plays an important role. Gender was found to be insignificant, highlighting that adoption is mainly driven by economic and infrastructural conditions.

Praveen et al. (2025) examined EV adoption under subsidy reduction conditions. The study found that environmental concern and novelty seeking strongly influence adoption, while financial incentives such as subsidies are less significant. This suggests that behavioural factors are more important than monetary incentives in adoption decisions.

Maheswari (2025) evaluated the economic feasibility of electric vehicles using cost–benefit analysis. The study found that although EVs require higher initial investment, they become cost-effective within six years due to savings in fuel and maintenance. It also highlights that fuel prices, electricity costs and policy support strongly influence financial viability.

Kalimuthu and Vekashine (2025) studied consumer behaviour towards electric two-wheelers in Coimbatore. The findings show increasing awareness and positive attitudes, but adoption is constrained by high initial cost, inadequate charging infrastructure and concerns over battery performance and reliability.

Statement of the Problem

Electric vehicles (EVs), particularly electric two-wheelers, are increasingly recognised as a crucial solution for reducing carbon emissions, improving urban air quality and decreasing dependence on fossil fuels. Despite their environmental and long-term economic advantages, the pace of adoption in many developing economies, including India, remains uneven and below potential. Although government initiatives, subsidies and policy support have been introduced to promote electric mobility, several structural and behavioural barriers continue to restrict widespread acceptance.

Despite its growing presence in the market, the electric two-wheeler segment faces multiple challenges that directly influence consumer adoption decisions. One of the foremost issues is inadequate charging infrastructure, particularly in densely populated urban areas, which limits convenience and accessibility for users. Closely related to this is the problem of range anxiety, where consumers remain uncertain about battery endurance and fear running out of charge during travel, thereby reducing confidence in EV usage. Affordability also remains a critical concern, as the high initial purchase cost of electric two-wheelers compared to conventional petrol vehicles continues to deter price-sensitive consumers, even though long-term operating costs are lower. In addition, limited consumer awareness regarding cost savings, environmental benefits and available government incentives further constrains adoption. Many potential users are still influenced by misconceptions and lack of reliable information. From a policy perspective, although various incentive schemes have been introduced, the effectiveness of regulatory support in

addressing real market barriers remains uneven. Issues such as battery replacement costs, resale value uncertainty, limited servicing infrastructure and perceived technological risks also contribute to hesitation among consumers.

The electric vehicle industry in India is still at a developing stage. Currently, it accounts for less than one per cent of total vehicle sales, although it has the potential to grow beyond five per cent in the coming years. At present, more than five lakh electric two-wheelers and a limited number of electric cars are in use across the country. Market growth has remained inconsistent and largely dependent on government incentives and policy support. Several manufacturers continue to operate in this segment under industry associations such as SMEV, contributing to gradual market development. A significant majority of electric vehicles in India are low-speed two-wheelers that do not require registration or driving licences. Most of these vehicles use lead-acid batteries to keep costs low; however, issues such as battery failure, limited lifespan and inadequate performance remain major constraints to wider adoption, alongside dependence on subsidies (Amit V Kulkarni et al., 2024). Against this backdrop, the present study seeks to examine the economic determinants, perceptions, policy responsiveness and financial concerns influencing the adoption of electric two-wheelers in Vijayawada city. It aims to address the gap in understanding how consumers evaluate electric two-wheelers in terms of cost, benefits, risks and infrastructure, thereby providing insights into the factors that facilitate or hinder adoption at the urban level.

Objectives and Methodology

To analyse the occupational differences in perceptions, motivations, policy preferences, economic expectations, infrastructural considerations, household financial impacts and major financial concerns related to the adoption of electric two-wheelers among respondents.

The present study is based on a descriptive research design aimed at examining the occupational differences in perceptions and economic considerations related to the adoption of electric two-wheelers. The study was conducted in Vijayawada city of Andhra Pradesh. Primary data were collected from 180 respondents, comprising 90 salaried employees and 90 self-employed individuals to ensure equal representation of both occupational groups. A structured interview schedule was used to gather data. The respondents were selected using a convenient sampling technique. The collected data were systematically classified, tabulated and analysed using simple percentage analysis to facilitate meaningful interpretation and comparison across occupational groups.

Results and discussion

Primary Reason for E2W Adoption

It is evident from the Table – 1 that the adoption of E2Ws is influenced by a mix of economic, environmental, policy-driven and social factors, with noticeable variation across occupational groups. It is observed from the table that at the aggregate level, friends' suggestion emerges as the most prominent reason for E2W adoption at 23.90 per cent, followed by cost savings at 21.70 per cent. Government subsidy accounts for 20.50 per cent, while attractive financing contributes 19.40 per cent. Environmental concern records the lowest share at 14.40 per cent, indicating relatively limited direct environmental motivation compared to other determinants.

Occupation wise result reveals distinct behavioural patterns. Among salaried employees, friends' suggestion is the leading factor at 28.90 per cent, significantly higher than other reasons, while cost savings, environmental concern and government subsidy are equally distributed at 18.90 per cent each. Attractive financing is comparatively less influential at 14.40 per cent in this group. In contrast, self-employed respondents exhibit a more economically driven pattern of adoption. Cost savings and attractive financing jointly dominate at 24.40 per cent each, indicating strong financial sensitivity. Government subsidy follows at 22.20 per cent, while friends' suggestion accounts for 18.90 per cent. Environmental concern remains the

least cited reason at 10.00 per cent, reinforcing its relatively weaker role in influencing adoption decisions within this group.

The discussion indicates that social influence plays a crucial role among salaried individuals, whereas financial considerations are more decisive for self-employed respondents. Policy instruments such as subsidies and financing schemes also hold considerable importance across both groups, though with varying intensity. Environmental concern, while present, does not emerge as a primary driver in either occupational category, suggesting that sustainability awareness alone may not be sufficient to significantly drive adoption.

In conclusion, the analysis highlights that E2W adoption is predominantly shaped by a combination of social influence and economic rationality, with occupation-specific differences in motivational structure.

Table – 1

DISTRIBUTION OF THE RESPONDENTS BY OCCUPATION AND PRIMARY REASON FOR E2W ADOPTION

Category	Cost savings	Environmental concern	Government subsidy	Attractive financing	Friends' suggestion	Total
Salaried employees	17 (18.90)	17 (18.90)	17 (18.90)	13 (14.40)	26 (28.90)	90 (100.00)
Self-employed	22 (24.40)	9 (10.00)	20 (22.20)	22 (24.40)	17 (18.90)	90 (100.00)
Total	39 (21.70)	26 (14.40)	37 (20.50)	35 (19.40)	43 (23.90)	180 (100.00)

Note: Figures in the parenthesis represent row percentages.

Source: Computed from the Primary Data.

Expected Total Expenditure of Electric Vehicles Compared to Petrol Scooters Over a Five-Year Period

It is evident from the Table-2 that respondents largely perceive electric vehicles (EVs) as more economical than petrol scooters over a five-year period, with clear differences in the degree of perceived savings across occupational categories. It is observed from the table that at the aggregate level, a majority of respondents (52.20 per cent) expect EVs to be significantly cheaper over five years, while 31.70 per cent believe they would be marginally cheaper. A smaller share of 15.60 per cent considers the expenditure to be roughly the same and only 0.60 per cent remain uncertain, indicating a generally strong positive cost perception towards EV adoption.

Occupation wise result reveals that salaried employees exhibit a more optimistic outlook, with 61.10 per cent expecting EVs to be significantly cheaper and 24.40 per cent anticipating marginal savings. Only 14.40 per cent perceive costs to be roughly the same and none report uncertainty, reflecting a relatively confident assessment of long-term economic benefits. Among self-employed respondents, perceptions are comparatively more dispersed. While 43.30 per cent expect significant savings and 38.90 per cent anticipate marginal savings, a higher proportion of 16.70 per cent believe costs would remain roughly the same. A small fraction of 1.10 per cent remains uncertain, indicating a slightly less decisive but still favourable cost expectation compared to salaried employees.

The discussion suggests that both occupational groups recognise the cost advantage of EVs, though salaried employees demonstrate stronger conviction regarding substantial long-term savings. Self-employed respondents, while still positive, display a more cautious assessment, possibly reflecting greater exposure to operational cost variability and business-related usage considerations. The presence of near-universal expectation of cost advantage reinforces the growing perception of EVs as economically viable over time.

In conclusion, the findings highlight a strong consensus that EVs offer financial benefits over petrol scooters within a five-year horizon.

Table – 2

DISTRIBUTION OF RESPONDENTS BY OCCUPATION AND THEIR OPINION ON THE EXPECTED TOTAL EXPENDITURE OF ELECTRIC VEHICLES COMPARED TO PETROL SCOOTERS OVER A FIVE-YEAR PERIOD

Category	Uncertain	Roughly the same	Marginally cheaper	Significantly cheaper	Total
Salaried employees	-	13 (14.40)	22 (24.40)	55 (61.10)	90 (100.00)
Self-employed	1 (1.10)	15 (16.70)	35 (38.90)	39 (43.30)	90 (100.00)
Total	1 (0.60)	28 (15.60)	57 (31.70)	94 (52.20)	180 (100.00)

Note: Figures in the parenthesis represent row percentages.

Source: Computed from the Primary Data.

Most Effective Policy Measure to Encourage Switching to Electric Two-Wheelers

It is evident from the Table – 3 that respondents overwhelmingly prioritise financial incentives linked to exchange and scrappage value as the most effective policy measure for encouraging the switch to electric two-wheelers, with notable occupational differences in secondary preferences. It is observed from the table that at the aggregate level, a dominant 67.80 per cent of respondents favour higher exchange or scrappage value for old petrol vehicles as the most effective incentive. This is followed by 23.90 per cent preferring complete waiver of registration fees and road tax, while 7.80 per cent support government-mandated green-only zones or parking benefits. A negligible 0.60 per cent prefer immediate on-road price reduction through direct subsidies, indicating limited appeal of upfront price cuts compared to asset-based incentives.

Occupation wise result reveals that both salaried employees and self-employed respondents strongly converge on scrappage-linked incentives, each recording 67.80 per cent preference. However, divergence is observed in secondary policy preferences. Among salaried employees, 30.00 per cent prefer complete waiver of registration fees and road tax, while only 1.10 per cent support both direct subsidies and green-zone or parking benefits. This indicates a stronger inclination towards tax-based relief among salaried individuals. In contrast, self-employed respondents display a more diversified set of preferences beyond scrappage incentives. While 17.80 per cent favour tax and fee waivers, a relatively higher 14.40 per cent support green-only zones or parking benefits. Notably, none prefer direct subsidy-based price reduction, reinforcing the limited attractiveness of upfront monetary incentives in this group.

The discussion indicates that asset value enhancement through scrappage schemes is the most compelling policy instrument across both occupational categories, reflecting the importance of perceived value recovery from existing petrol vehicles. Tax exemptions and usage-based incentives such as parking benefits also play a supplementary role, particularly among self-employed respondents who appear more responsive to operational advantages. Direct purchase subsidies, however, emerge as the least influential measure, suggesting that respondents place greater weight on long-term and embedded financial benefits rather than immediate price reductions.

In conclusion, the findings highlight that exchange or scrappage-linked incentives are the most powerful policy driver for EV adoption across occupations.

Table – 3

DISTRIBUTION OF RESPONDENTS BY OCCUPATION AND THEIR OPINION ON THE MOST EFFECTIVE POLICY MEASURE TO ENCOURAGE SWITCHING TO ELECTRIC TWO-WHEELERS

Category	Immediate "on-road" price reduction via direct subsidies	Higher "Exchange/ Scrappage" value for your old petrol vehicle	Complete waiver of registration fees and road tax	Government-mandated "Green-only" zones or parking benefits	Total
Salaried employees	1 (1.10)	61 (67.80)	27 (30.00)	1 (1.10)	90 (100.00)
Self-employed	-	61 (67.80)	16 (17.80)	13 (14.40)	90 (100.00)
Total	1 (0.60)	122 (67.80)	43 (23.90)	14 (7.80)	180 (100.00)

Note: Figures in the parenthesis represent row percentages.

Source: Computed from the Primary Data.

Impact of Charging Ecosystem on Economic Calculation

It is evident from the Table – 4 that the charging ecosystem significantly shapes the economic perception of electric two-wheeler usage, with home charging emerging as the dominant cost-saving strategy and clear occupational variation in perceived risks and barriers. It is observed from the table that at the aggregate level, 46.70 per cent of respondents believe that substantial savings are achieved by charging exclusively at home or residential tariff rates. This is followed by 24.40 per cent who are willing to pay a premium for fast-charging facilities at malls or offices. About 13.90 per cent consider the cost of installing a home charging point as a major entry barrier, while 8.90 per cent associate range anxiety with a high economic risk cost. A smaller 6.10 per cent perceive unreliable power supply or voltage fluctuations as a potential risk to battery life and associated economic loss.

Occupation wise result reveals distinct behavioural and perceptual differences. Among salaried employees, 31.10 per cent prioritise savings through home charging, while 23.30 per cent are willing to pay extra for fast-charging access. Notably, 21.10 per cent identify home charger installation cost as a barrier and 12.20 per cent each express concern over range anxiety and power supply-related battery risk, indicating a relatively balanced perception of both cost advantages and infrastructural constraints. In contrast, self-employed respondents exhibit a stronger reliance on home charging economics, with a high 62.20 per cent highlighting it as the primary cost-saving mechanism. A smaller 25.60 per cent are willing to pay for fast-charging convenience. Only 6.70 per cent consider home charger installation cost as a barrier and 5.60 per cent associate range anxiety with economic risk.

The discussion indicates that home charging is the central economic driver in EV usage across both occupational groups, though its dominance is significantly stronger among self-employed individuals. Salaried employees demonstrate a more diversified risk perception, reflecting greater sensitivity to infrastructural and technical uncertainties. Willingness to pay for fast charging suggests emerging acceptance of convenience-based pricing, particularly in urban usage contexts.

In conclusion, the charging ecosystem plays a decisive role in shaping the economic evaluation of electric two-wheelers.

Table – 4

DISTRIBUTION OF RESPONDENTS BY OCCUPATION AND THEIR OPINION ON THE IMPACT OF CHARGING ECOSYSTEM ON ECONOMIC CALCULATION

Category	Save more by charging exclusively at home/residential rates	Willing to pay a premium for fast-charging stations at malls/offices	Cost of installing a home charging point is a major entry barrier	Range anxiety (fear of running out of charge) represents a high "risk cost"	Unreliable power supply/voltage issues might damage the battery (economic risk)	Total
Salaried employees	28 (31.10)	21 (23.30)	19 (21.10)	11 (12.20)	11 (12.20)	90 (100.00)
Self-employed	56 (62.20)	23 (25.60)	6 (6.70)	5 (5.60)	-	90 (100.00)
Total	84 (46.70)	44 (24.40)	25 (13.90)	16 (8.90)	11 (6.10)	180 (100.00)

Note: Figures in the parenthesis represent row percentages.

Source: Computed from the Primary Data.

Impact of Electric Vehicle Adoption on Personal and Household Economy

It is evident from the Table – 5 that electric vehicle adoption is predominantly perceived as a mechanism for improving household financial liquidity, primarily through increased disposable income, while also generating secondary benefits related to mobility flexibility and asset value enhancement, with notable occupational variation in perception structure. It is observed from the table that at the aggregate level, a majority of 54.40 per cent of respondents perceive that EV adoption leads to a significant increase in monthly disposable income for other expenses. This is followed by 32.20 per cent who believe it allows more frequent or longer commutes for work without budget strain. A smaller 7.20 per cent associate EV adoption with an increase in the resale value of household assets over time, while 6.10 per cent consider it beneficial in reducing long-term health-related expenditures due to lower local pollution levels.

Occupation wise result reveals that among salaried employees, the perception of improved disposable income is dominant at 60.00 per cent, indicating a strong focus on monthly budget relief. This is followed by 34.40 per cent who highlight enhanced commuting flexibility, while only 5.60 per cent recognise health-related savings and none perceive resale value appreciation as a benefit. This suggests that salaried respondents primarily evaluate EV adoption through immediate cash flow and mobility advantages. Among self-employed respondents, although increased disposable income remains the leading perception at 48.90 per cent, the distribution is more diversified. About 30.00 per cent emphasise commuting flexibility, 14.40 per cent recognise asset resale value gains and 6.70 per cent highlight health-related expenditure reduction. The presence of resale value consideration is particularly notable in this group, indicating a broader asset-oriented financial perspective.

The discussion indicates that EV adoption is largely interpreted as a household-level financial optimisation tool rather than solely an environmental choice. Improved disposable income emerges as the most significant perceived benefit across both occupational categories, reinforcing the economic rationale for adoption. While mobility flexibility also plays a substantial role, long-term considerations such as health savings and asset value appreciation remain secondary but non-negligible, particularly among self-employed respondents who exhibit a more diversified benefit structure.

In conclusion, electric vehicle adoption is strongly associated with improved household economic well-being, primarily through enhanced disposable income.

Table – 5

DISTRIBUTION OF RESPONDENTS BY OCCUPATION AND THEIR OPINION ON THE IMPACT OF ELECTRIC VEHICLE ADOPTION ON PERSONAL AND HOUSEHOLD ECONOMY

Category	Allows for more frequent/longer commutes for work without budget strain	Significant increase in monthly disposable income for other expenses	Reduces long-term health-related expenditures (due to lower local pollution)	Increases the resale value of my household assets over time	Total
Salaried employees	31 (34.40)	54 (60.00)	5 (5.60)	-	90 (100.00)
Self-employed	27 (30.00)	44 (48.90)	6 (6.70)	13 (14.40)	90 (100.00)
Total	58 (32.20)	98 (54.40)	11 (6.10)	13 (7.20)	180 (100.00)

Note: Figures in the parenthesis represent row percentages.

Source: Computed from the Primary Data.

Financial Concern Regarding Electric Two-Wheelers

It is evident from the Table – 6 that the dominant financial concern regarding electric two-wheelers is centred on post-warranty battery replacement costs, with other concerns such as resale value, servicing ecosystem and technological obsolescence playing comparatively secondary roles and with marked occupational differences in intensity of concern. It is observed from the table that at the aggregate level, a substantial 57.80 per cent of respondents identify the high one-time cost of battery replacement after warranty as the biggest financial concern. This is followed by 18.90 per cent who highlight the lack of affordable local third-party repair shops leading to high service costs and 17.80 per cent who are concerned about poor resale or buyback value in the second-hand market. A smaller proportion of 4.40 per cent perceive the risk of technological obsolescence within 2 to 3 years, while only 1.10 per cent consider fire safety risks as the major financial concern.

Occupation wise result reveals a sharper concentration of concern among self-employed respondents, where 72.20 per cent identify battery replacement cost as the primary issue, significantly higher than their salaried counterparts. This is followed by 13.30 per cent citing resale value concerns, 12.20 per cent highlighting lack of affordable repair infrastructure and 2.20 per cent indicating technological obsolescence, while none report fire safety as a financial concern. Among salaried employees, the pattern is comparatively more distributed. While 43.30 per cent still regard battery replacement cost as the major concern, 25.60 per cent emphasise lack of affordable repair services and 22.20 per cent point to poor resale value. A smaller 6.70 per cent are concerned about technological obsolescence and 2.20 per cent cite fire safety risks. This indicates a broader spread of apprehensions across both cost and ecosystem-related factors.

The discussion indicates that long-term ownership cost, particularly battery replacement, is the central financial anxiety across both occupational groups, reinforcing the perception of EVs as having high deferred costs despite lower running expenses. However, self-employed respondents exhibit a more concentrated concern structure, strongly dominated by battery-related costs, suggesting higher sensitivity to large lump-

sum expenditures. In contrast, salaried employees display a more diversified set of financial concerns, reflecting greater attention to service infrastructure, resale dynamics and technology stability.

In conclusion, battery replacement cost emerges as the most critical financial concern influencing EV adoption decisions.

Table – 6

DISTRIBUTION OF RESPONDENTS BY OCCUPATION AND THEIR OPINION ON THE BIGGEST FINANCIAL CONCERN REGARDING ELECTRIC TWO-WHEELERS

Category	The high one-time cost of battery replacement after the warranty	Poor resale/buyback value in the local second-hand market	Lack of affordable, local "third-party" repair shops (high service costs)	The risk of the technology becoming obsolete within 2–3 years	Fire safety risks leading to potential loss of property or higher insurance	Total
Salaried employees	39 (43.30)	20 (22.20)	23 (25.60)	6 (6.70)	2 (2.20)	90 (100.00)
Self-employed	65 (72.20)	12 (13.30)	11 (12.20)	2 (2.20)	-	90 (100.00)
Total	104 (57.80)	32 (17.80)	34 (18.90)	8 (4.40)	2 (1.10)	180 (100.00)

Note: Figures in the parenthesis represent row percentages.

Source: Computed from the Primary Data.

Conclusion

It is evident from the overall analysis of all six tables that the adoption and perception of electric two-wheelers are primarily shaped by an interplay of economic benefits, policy incentives, infrastructure readiness and long-term cost expectations, with clear occupational variations between salaried and self-employed respondents. Across the findings, social influence and economic rationality emerge as the dominant drivers of adoption, where friends' suggestions and perceived cost savings play a major role. At the same time, both groups strongly recognise the long-term affordability of electric two-wheelers compared to petrol scooters, with a majority expecting significant cost advantages over a five-year period. This reinforces the growing perception of EVs as a financially viable alternative rather than merely an environmental choice.

Policy preferences further highlight that exchange or scrappage-based incentives are the most effective motivators for switching, indicating that respondents value tangible asset recovery over upfront subsidies. Tax exemptions and usage-related benefits also hold importance, but direct price reductions are comparatively less influential. The charging ecosystem analysis reveals that home charging is central to the economic advantage of EVs, particularly among self-employed respondents, while salaried individuals exhibit greater concern regarding installation costs, range anxiety and power reliability. This indicates that infrastructure quality and accessibility remain crucial determinants of adoption experience. At the household level, EV adoption is largely associated with improved disposable income and enhanced mobility flexibility, suggesting that users perceive EVs as tools for financial optimisation. Secondary benefits such as health

savings and asset value appreciation are acknowledged but remain less prominent in decision-making. However, despite these positive perceptions, significant financial concerns persist, particularly regarding high battery replacement costs after warranty, followed by resale value uncertainty and limited repair ecosystem support. These concerns represent key psychological and economic barriers that may slow wider adoption unless addressed through policy and market interventions.

The study reveals that while electric two-wheelers are increasingly viewed as economically advantageous and socially acceptable, sustained adoption depends on strengthening post-purchase financial security, improving service infrastructure and enhancing long-term asset confidence among users. Occupational differences further indicate that salaried respondents are more influenced by social and infrastructural factors, whereas self-employed respondents respond more strongly to direct financial implications and cost recovery mechanisms.

Based on the findings, it is suggested that policy interventions should focus more on strengthening exchange or scrappage-linked incentives, as respondents show higher responsiveness to asset recovery benefits compared to direct purchase subsidies. Improving the battery ecosystem through price stabilisation mechanisms, extended warranties and development of affordable replacement options can significantly reduce the primary financial concern affecting adoption decisions. Expansion of reliable charging infrastructure, particularly affordable home charging solutions and stable public charging networks, is essential to enhance user confidence. Further, strengthening local servicing ecosystems through trained third-party repair networks can reduce long-term maintenance concerns and improve resale market confidence. Awareness programmes highlighting total cost savings, health benefits and long-term household economic advantages may also help in reinforcing positive perceptions and accelerating adoption across both salaried and self-employed groups.

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