



Research Article

Adoption of Electric Vehicles in India: Consumer Behaviour, Economic Factors and Market Trends

Dr. Inamur Rahaman ^{1*}, Dr. Abhishek Kumar Singh ², Kajal ³

¹Assistant Professor, Department of Commerce, M.M.H College, Ghaziabad, Uttar Pradesh, India

²Assistant Professor, Department of Commerce, M.M.H College, Ghaziabad, Uttar Pradesh, India

³Research Scholar, Department of Commerce, M.M.H College, Ghaziabad, Uttar Pradesh, India

Corresponding Author: * Dr. Inamur Rahaman

DOI: <https://doi.org/10.5281/zenodo.21989660>

Abstract

The transition from conventional internal combustion engine vehicles to electric vehicles (EVs) has become an important component of India's strategy for reducing fossil-fuel dependence, improving energy security, lowering transport-related emissions, and promoting sustainable mobility. Electric mobility in India is developing across two-wheelers, three-wheelers, passenger vehicles, buses, and commercial vehicles, although the pace of adoption varies considerably among vehicle categories and consumer groups. The present study investigates the adoption of electric vehicles in India with particular emphasis on consumer behaviour, economic factors, government policies, technological developments, charging infrastructure, ownership costs, and emerging market trends. The study is based on a comprehensive review of academic literature, government publications, automobile-industry reports, and international energy assessments published between 2017 and 2026. Recent evidence indicates rapid growth in India's electric two- and three-wheeler markets, while passenger-car adoption remains at an earlier stage. In 2025, India's total EV sales reached approximately 2.3 million units, while electric car sales increased by more than 75% to approximately 165,000 units. Electric three-wheeler sales approached 800,000 units, and India remained the world's largest electric three-wheeler market. Consumer decisions are influenced by purchase price, fuel savings, total cost of ownership, battery range, charging availability, vehicle performance, government incentives, environmental awareness, brand reputation, and resale expectations. The study finds that declining battery costs, expanding model availability, policy support, digital technologies, and increasing consumer awareness are strengthening EV adoption. However, high initial purchase prices, charging infrastructure gaps, range anxiety, battery-related concerns, financing constraints, and uncertainty regarding resale value continue to restrict mass adoption. The study concludes that India's EV transition requires an integrated approach combining affordable vehicles, reliable charging infrastructure, stable policy support, domestic manufacturing, consumer education, battery recycling, and innovative financing mechanisms.

Manuscript Information

- ISSN No: 2583-7397
- Received: 11-07-2026
- Accepted: 15-08-2026
- Published: 18-08-2026
- IJCRM:5(4); 2026: 780-785
- ©2026, All Rights Reserved
- Plagiarism Checked: Yes
- Peer Review Process: Yes

How to Cite this Article

Rahaman I, Singh A K, Kajal. Adoption Of Electric Vehicles in India: Consumer Behaviour, Economic Factors and Market Trends. Int J Contemp Res Multidiscip. 2026;5(4):780-785.

Access this Article Online



www.multiarticlesjournal.com

KEYWORDS: Electric Vehicles; EV Adoption; Consumer Behaviour.

1. INTRODUCTION

Transportation is one of the most important components of modern economic development, but its dependence on petroleum-based fuels has created significant environmental, economic, and energy-security challenges. Rapid urbanization, rising vehicle ownership, increasing mobility demand, and expansion of road transportation have contributed to growing fuel consumption and transport-related emissions. In this context, electric vehicles have emerged as an important technological pathway for transforming road transportation and reducing dependence on conventional internal combustion engine vehicles. The transition toward electric mobility is increasingly associated with energy security, decarbonization, technological innovation, and sustainable urban development [1–4].

India represents a particularly important market for electric mobility because of its large population, rapidly expanding urban areas, significant two- and three-wheeler markets, and high dependence on imported fossil fuels. Electric vehicles can potentially reduce petroleum consumption, lower operating costs for consumers, and support the development of domestic manufacturing and battery-related industries. However, India's EV transition differs from that of many developed automobile markets because two-wheelers and three-wheelers constitute a particularly large share of road transportation and are often more sensitive to operating costs than passenger cars [3–6].

Government policy has played an important role in creating an enabling environment for electric mobility. India's initial major national intervention was the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) programme, followed by FAME II and subsequently the **PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE)** scheme. PM E-DRIVE began implementation in October 2024 and focuses particularly on electric two-wheelers, three-wheelers, buses, trucks, and charging infrastructure. The International Energy Agency reports that the scheme has a budget envelope of approximately USD 1.3 billion through March 2026 [7].

The economic attractiveness of electric vehicles is an important determinant of consumer adoption. Although EVs can have higher initial purchase prices than comparable conventional vehicles, their operating costs can be substantially lower because electricity is generally cheaper per kilometre than petrol or diesel and electric powertrains require fewer routine maintenance components. This creates an important distinction between **purchase cost** and **total cost of ownership (TCO)**. For high-utilization vehicles such as taxis, delivery vehicles, three-wheelers, and commercial fleets, lower running costs can make EVs economically attractive even when their initial purchase price is relatively high [5,8–10].

Consumer behaviour, however, is not determined by economics alone. Consumers consider multiple attributes before purchasing an electric vehicle, including driving range, charging time, battery life, safety, vehicle performance, design, availability of service centres, brand reputation, resale value, financing options, and perceptions of technological reliability. Environmental awareness can encourage adoption, but economic considerations often become more important when

consumers compare EVs with conventional alternatives. The relative importance of these factors varies according to income, location, travel distance, vehicle category, and individual mobility requirements [9–12].

Range anxiety remains one of the most frequently discussed psychological and practical barriers to EV adoption. Consumers may hesitate to purchase an EV when they are uncertain about the distance that can be travelled on a single charge or the availability of charging facilities during longer journeys. The problem can be particularly significant for consumers living in areas where public charging infrastructure is limited. Consequently, charging infrastructure is not merely a technical requirement but also an important determinant of consumer confidence and perceived convenience [10–13].

Battery technology represents another important factor influencing EV adoption. Improvements in battery energy density, charging speed, thermal management, durability, and cost have contributed to improvements in vehicle range and affordability. At the same time, battery degradation, replacement costs, fire-safety concerns, raw-material supply, and end-of-life recycling remain important consumer and policy concerns. The development of domestic battery manufacturing and recycling capabilities is therefore essential for creating a resilient electric-mobility ecosystem [11–15].

India's EV market is characterized by considerable differences among vehicle categories. Electric two-wheelers have achieved substantial penetration because of relatively low operating costs and the suitability of electrification for short-distance urban mobility. India remained the world's second-largest electric two-wheeler market in 2025, although sales increased only modestly to below 1.3 million units. Electric three-wheelers have achieved considerably higher penetration; India remained the world's largest electric three-wheeler market, with nearly 800,000 electric three-wheelers sold in 2025 [16].

Passenger electric cars, by contrast, remain at a comparatively early stage of adoption. According to the IEA, India's electric car sales increased by approximately 75% in 2025 to around 165,000 units, representing nearly 4% of total car sales. The number of electric car models available increased from 33 in 2024 to 45 in 2025, providing consumers with greater choice. Approximately 60% of electric car sales were produced domestically by Tata and Mahindra, demonstrating the growing role of Indian manufacturers in the passenger EV market [16].

The broader Indian automobile market is also becoming increasingly supportive of electrification. The Society of Indian Automobile Manufacturers reported that registrations of electric passenger vehicles increased by more than 80% during FY 2025–26. The same period also witnessed strong overall passenger-vehicle and two-wheeler sales, suggesting that improving consumer purchasing power and broader automotive-market conditions can influence EV adoption [17].

Consumer choice is also influenced by government incentives, taxation, financing, electricity prices, petrol and diesel prices, and local regulations. Stable policy frameworks can increase consumer confidence and encourage manufacturers to introduce new models, whereas uncertainty regarding subsidies or regulations can delay purchasing decisions. The transition therefore depends upon coordination among central and state

governments, automobile manufacturers, financial institutions, electricity providers, charging operators, and consumers [7,14,18].

The economic significance of EV adoption extends beyond individual vehicle purchases. Expansion of electric mobility creates opportunities for battery manufacturing, charging infrastructure, software, power electronics, recycling, vehicle servicing, renewable-energy integration, and associated employment. Increasing domestic production can also strengthen India's industrial capabilities and reduce dependence on imported petroleum and selected components. Therefore, EV adoption represents not only a transportation transition but also an emerging industrial and economic transformation [3,14,19].

Against this background, the present study investigates the adoption of electric vehicles in India with particular emphasis on consumer behaviour, economic factors, government policies, technological developments, and market trends. The study seeks to understand the major factors encouraging and restricting EV adoption and to assess the emerging trajectory of India's electric-mobility market through evidence available up to 2026.

2. MATERIALS AND METHODS

The present study adopts a comprehensive qualitative and analytical research methodology to investigate electric-vehicle adoption in India, with particular emphasis on consumer behaviour, economic factors, government policies, technological developments, and market trends. The research is primarily based on secondary data and integrates concepts from economics, consumer behaviour, marketing, transportation studies, environmental economics, energy policy, automobile management, and sustainable development. This interdisciplinary approach enables a systematic assessment of the factors influencing consumer decisions and the development of India's EV market [1–3].

Data were collected through an extensive review of peer-reviewed journal articles, conference proceedings, government publications, policy documents, automobile-industry reports, energy assessments, and institutional studies published between **2017 and 2026**. Major sources included the Ministry of Heavy Industries, Ministry of Road Transport and Highways, NITI Aayog, Reserve Bank of India, Society of Indian Automobile Manufacturers, International Energy Agency, International Renewable Energy Agency, World Bank, and other recognized organizations involved in transportation, energy, manufacturing, and sustainability research [4–8].

The study examines different electric-vehicle categories, including battery electric two-wheelers, three-wheelers, passenger cars, buses, and commercial vehicles. Particular emphasis was placed on differences in adoption patterns among these categories because their purchase motivations, operating conditions, travel distances, and total cost of ownership differ substantially. Electric two- and three-wheelers were examined as high-utilization and cost-sensitive segments, while passenger cars were assessed in relation to household purchasing power, range requirements, charging convenience, technology preferences, and brand considerations [7,16].

Consumer behaviour was analysed through major variables identified in the literature, including purchase price, operating cost, maintenance cost, driving range, charging time, charging infrastructure, battery reliability, safety, environmental awareness, brand image, government incentives, financing availability, resale value, technological confidence, and peer influence. These variables were evaluated to identify the relative economic, psychological, technological, and social factors affecting EV purchase intentions [9–13].

Economic analysis focused on the relationship between initial vehicle cost and total cost of ownership. Factors considered included electricity expenditure, petrol and diesel prices, maintenance requirements, battery replacement concerns, financing costs, taxation, subsidies, insurance, and vehicle utilization. The analysis particularly considered the economic attractiveness of EVs for high-mileage users and commercial operators, where lower running costs may compensate for higher initial purchase prices [5,8,10].

Market-trend analysis was conducted using reported EV sales, sales growth, market shares, model availability, and vehicle-category trends. The latest available evidence indicates that India's total EV sales reached approximately **2.3 million units in 2025**, while electric car sales reached approximately 165,000 units and electric three-wheeler sales approached 800,000 units [16]. Current 2026 developments were also incorporated where official or authoritative sources were available.

Government-policy analysis examined the evolution from FAME to PM E-DRIVE and related manufacturing and charging-infrastructure measures. Particular attention was given to the changing policy emphasis from direct consumer incentives toward broader support for electric two- and three-wheelers, buses, trucks, manufacturing, and charging infrastructure [7,18].

To ensure reliability and validity, information obtained from multiple academic, governmental, industry, and international sources was systematically cross-verified using data triangulation. Official government and international institutional sources were given greater weight for current market statistics and policy information, while peer-reviewed literature was used to interpret consumer behaviour, economic determinants, and technological factors. Differences in market statistics were interpreted according to reporting period, vehicle category, and whether the data represented registrations, sales, or estimates.

The synthesized evidence was subsequently organized into major themes: consumer behaviour, economic determinants, policy influence, technological development, infrastructure, market growth, and barriers to adoption. This approach provides a comprehensive assessment of India's EV transition while distinguishing national market trends from individual consumer-level behaviour.

3. RESULTS

The findings demonstrate that India's electric-vehicle market has entered a period of accelerated expansion, although adoption remains highly uneven across vehicle categories. Electric two-wheelers and three-wheelers have achieved considerably greater market penetration than passenger electric

cars, largely because of their lower operating costs, high utilization rates, suitability for urban mobility, and relatively favourable total cost of ownership. The IEA reports that India's total EV sales reached approximately **2.3 million vehicles in 2025**, while electric car sales increased by more than 75% to around 165,000 units.

Consumer behaviour analysis indicates that **economic considerations are among the strongest drivers of EV adoption**. Lower fuel and maintenance expenditure, particularly for high-mileage users, can compensate for the relatively high initial purchase price of an EV. This economic advantage is particularly significant for electric three-wheelers, delivery vehicles, fleet operators, and urban commuters. The IEA estimates that, with applicable subsidies, the five-year total cost of ownership of an average electric two-wheeler in India could be approximately 40% lower than that of an equivalent internal-combustion vehicle.

The findings further indicate that consumer concerns about **range, charging infrastructure, battery durability, and resale value** remain important barriers, particularly in the passenger-car segment. Consumers who undertake longer journeys or lack access to home charging facilities may perceive EVs as less convenient than conventional vehicles. Consequently, increasing the geographical coverage, reliability, speed, and interoperability of charging infrastructure is likely to strengthen consumer confidence.

The analysis shows substantial growth in India's electric three-wheeler market. Electric three-wheeler sales increased to nearly **800,000 units in 2025**, representing continued growth in the country's most electrified road-transport segment. India's position as the world's largest electric three-wheeler market demonstrates the importance of commercial and shared mobility in the country's EV transition.

Electric two-wheelers also remain an important segment, although growth was more moderate in 2025. Sales increased by approximately 5% to below 1.3 million units, representing around 6% of India's total two-wheeler sales. This suggests that although economic benefits are attractive, factors such as financing, product availability, charging convenience, consumer

preferences, and competitive pricing continue to influence adoption.

Passenger electric vehicles show a different development pattern. Electric car sales increased strongly in 2025, reaching approximately 165,000 units and nearly 4% of total car sales. The number of available electric car models increased from 33 in 2024 to 45 in 2025, indicating increasing product diversity and consumer choice. Domestic manufacturers accounted for roughly 60% of electric-car sales, demonstrating the growing importance of Indian automotive companies in the EV market.

The findings also indicate that **government policy continues to influence consumer and manufacturer behaviour**. PM E-DRIVE, implemented from October 2024, focuses on electric two- and three-wheelers, buses, trucks, and charging infrastructure. This policy direction reflects the importance of segments where electrification can produce significant economic and environmental benefits.

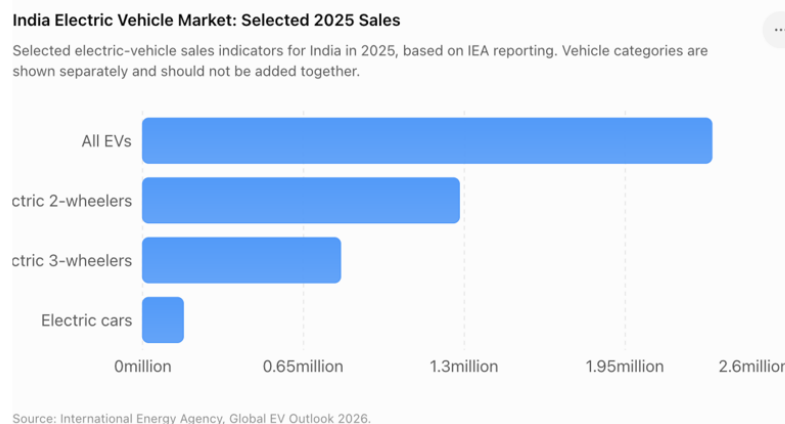
The automobile industry has also recorded strong growth in electric passenger-vehicle registrations. SIAM reported that electric passenger-vehicle registrations increased by more than 80% in FY 2025–26. This indicates that consumer acceptance of electric cars is increasing from a relatively low base and that the passenger-vehicle segment may become increasingly important in the next phase of India's EV transition.

Current 2026 trends provide further evidence of increasing momentum. The IEA reported that EV sales in India roughly doubled between March and June 2026 compared with the corresponding period in 2025. This occurred amid broader global EV growth and renewed attention to fuel-price volatility, indicating that operating-cost considerations can influence consumer demand.

Overall, the results demonstrate that EV adoption in India is driven by an interaction of **economic savings, government policy, technological improvement, increasing model availability, environmental awareness, and changing consumer preferences**. Nevertheless, high upfront costs, charging limitations, battery concerns, financing barriers, and uncertainty regarding long-term resale value continue to influence adoption decisions.

Table. Major Factors Influencing Electric Vehicle Adoption in India

Factor	Influence on Consumer Adoption	Major Implication
Purchase Price	Negative when EV price is substantially higher	Affordable models can accelerate adoption
Fuel Cost Savings	Strong positive	Improves long-term economic attractiveness
Maintenance Cost	Positive	Lower routine maintenance supports TCO advantage
Government Incentives	Positive	Reduces effective purchase cost and improves confidence
Charging Infrastructure	Strong positive when available	Reduces range anxiety and improves convenience
Driving Range	Important	Greater range increases suitability for longer journeys
Battery Life & Safety	Important	Influences trust and perceived ownership risk
Financing Availability	Positive	Reduces upfront affordability barrier
Environmental Awareness	Positive	Encourages sustainable-consumption behaviour
Brand Reputation	Important	Influences perceived quality and reliability
Model Availability	Positive	Greater choice increases consumer acceptance
Resale Value	Important	Affects long-term ownership decisions
Electricity Prices	Positive when relatively low	Strengthens operating-cost advantage
Petrol/Diesel Prices	Positive for EV adoption	Higher fuel costs improve EV attractiveness
Digital & Smart Features	Increasing importance	Appeals to technology-oriented consumers



Graph

4. DISCUSSION

The present study demonstrates that India's transition toward electric mobility is progressing rapidly but remains structurally different across vehicle categories. The strongest adoption has occurred in two- and three-wheelers, where operating economics are particularly important. Frequent daily travel increases fuel expenditure for conventional vehicles, making the lower running cost of EVs economically attractive. This helps explain why commercial three-wheelers and urban two-wheelers have generally moved faster toward electrification than passenger cars [5,7,16].

Consumer behaviour is increasingly shaped by **total cost of ownership rather than purchase price alone**. Although the initial price of an EV can be higher, lower electricity expenditure, fewer moving mechanical components, reduced maintenance requirements, and potentially lower lifetime operating costs can improve the overall economic proposition. For consumers with high annual mileage, these savings can substantially shorten the effective payback period.

However, the importance of initial purchase price should not be underestimated. Indian consumers remain highly price-sensitive, particularly in the mass-market two-wheeler segment. Financing availability, interest rates, down-payment requirements, and monthly instalments can therefore influence EV adoption as much as the lifetime operating cost. Innovative financing models, battery leasing, fleet financing, and usage-based financial products could help reduce the initial affordability barrier.

The study also indicates that **charging infrastructure is a behavioural factor as much as an infrastructural factor**. Consumers may avoid purchasing an EV even when the vehicle is economically attractive if they believe charging will be inconvenient. Home charging is particularly valuable for urban households with suitable parking, while public fast-charging infrastructure becomes more important for long-distance users, commercial fleets, and consumers without private parking.

Battery technology represents both an opportunity and a concern. Improvements in battery energy density, charging speed, durability, and thermal management can increase consumer confidence and improve vehicle performance. At the same time, uncertainty regarding battery replacement costs,

degradation, safety, and resale value can discourage some potential buyers. Developing transparent battery warranties, battery-health certification, standardized testing, and recycling systems could reduce these concerns.

Government policy has played a significant role in shaping India's EV market. The shift toward PM E-DRIVE illustrates the increasing emphasis on targeted support for specific vehicle segments and charging infrastructure. Policy stability is particularly important because consumers and automobile manufacturers make decisions involving several years of expected vehicle ownership and investment. Sudden changes in incentives or taxation can create uncertainty and affect market confidence.

The growing number of available models is another important factor. India's electric-car market expanded from 33 available models in 2024 to 45 in 2025, according to IEA analysis. Greater choice enables consumers to compare price, range, body style, performance, features, and brand reputation more effectively. Increasing competition among manufacturers may also encourage technological innovation and price reductions.

The role of domestic manufacturers is particularly significant for India's long-term EV transition. Approximately 60% of India's electric-car sales in 2025 were produced domestically by Tata and Mahindra. Strong domestic production can contribute to employment, technological development, supply-chain expansion, and industrial competitiveness while reducing exposure to international supply disruptions.

The economic implications of EV adoption extend beyond vehicle ownership. Growth in electric mobility can generate new industries in batteries, power electronics, software, charging infrastructure, renewable-energy integration, vehicle servicing, and recycling. It may also change the structure of employment within the automobile industry by increasing demand for electrical, electronic, software, battery, and energy-management skills.

At the same time, the transition presents challenges for conventional automobile component manufacturers, fuel retailers, mechanics, and other businesses dependent on internal-combustion technology. Policymakers therefore need to consider workforce reskilling and industrial transition alongside consumer incentives.

The 2026 market evidence suggests that India's EV transition is gaining further momentum. The IEA reports that electric-vehicle sales in India approximately doubled between March and June 2026 compared with the same period of 2025. If sustained, this momentum could accelerate the shift from early adopters toward broader mainstream consumer adoption.

REFERENCES

1. International Energy Agency. Global EV outlook 2017: two million and counting. Paris: IEA; 2017.
2. NITI Aayog. Zero emission vehicles: transforming India's mobility. New Delhi: Government of India; 2018.
3. NITI Aayog, Rocky Mountain Institute. India's electric mobility transformation: progress to date and future opportunities. New Delhi: Government of India; 2019.
4. Ministry of Heavy Industries. Faster adoption and manufacturing of hybrid and electric vehicles (FAME) India scheme. New Delhi: Government of India; 2019.
5. International Energy Agency. Global EV outlook 2020. Paris: IEA; 2020.
6. NITI Aayog. Roadmap for electric mobility in India. New Delhi: Government of India; 2021.
7. International Energy Agency. Global EV outlook 2022. Paris: IEA; 2022.
8. Reserve Bank of India. Report on trend and progress of banking in India. Mumbai: RBI; 2022.
9. Ministry of Heavy Industries. FAME India scheme phase II: progress and electric mobility initiatives. New Delhi: Government of India; 2023.
10. International Energy Agency. Global EV outlook 2023. Paris: IEA; 2023.
11. International Renewable Energy Agency. Electric mobility and renewable energy integration. Abu Dhabi: IRENA; 2023.
12. NITI Aayog. Electric mobility and charging infrastructure in India. New Delhi: Government of India; 2023.
13. International Energy Agency. Global EV outlook 2024. Paris: IEA; 2024.
14. Ministry of Heavy Industries. PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) scheme. New Delhi: Government of India; 2024.
15. Society of Indian Automobile Manufacturers. Auto industry performance and electric mobility trends. New Delhi: SIAM; 2024.
16. International Energy Agency. Global EV outlook 2025. Paris: IEA; 2025.
17. Society of Indian Automobile Manufacturers. Auto industry performance of Q4 and FY 2025-26. New Delhi: SIAM; 2026.
18. Ministry of Heavy Industries. PM E-DRIVE and electric mobility programme updates. New Delhi: Government of India; 2025.
19. International Renewable Energy Agency. Innovation outlook: electric mobility and renewable energy. Abu Dhabi: IRENA; 2025.
20. International Energy Agency. Global EV outlook 2026. Paris: IEA; 2026.
21. International Energy Agency. Global energy review 2026: technology—electric vehicles. Paris: IEA; 2026.
22. Society of Indian Automobile Manufacturers. Auto industry performance of Q4 (January-March 2026) and FY 2025-26. New Delhi: SIAM; 2026.
23. International Energy Agency. Electric car markets in a time of uncertainty. Paris: IEA; 2026.
24. International Energy Agency. Quarterly sales of electric cars break records in several key markets amid energy crisis. Paris: IEA; 2026.
25. NITI Aayog. Electric mobility, sustainable transport and India's energy transition. New Delhi: Government of India; 2026.

Creative Commons (CC) License

This article is an open-access article distributed under the terms and conditions of the Creative Commons Attribution–Non-Commercial–No Derivatives 4.0 International (CC BY-NC-ND 4.0) license. This license permits sharing and redistribution of the article in any medium or format for non-commercial purposes only, provided that appropriate credit is given to the original author(s) and source. No modifications, adaptations, or derivative works are permitted under this license.

About the Corresponding Author

Dr. Inamur Rahaman is an Assistant Professor in the Department of Commerce at M.M.H. College, Ghaziabad, India. His academic interests include commerce, business studies, finance, management, and contemporary issues in the Indian business environment. He is actively engaged in teaching, research, and academic activities.