

The major challenges and structural changes reshaping the Indian automobile sector

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Executive Summary

The Automobile industry rarely goes through the levels of evolution it is going through right now. The innovation of EVs has forever changed the industry, dividing it into what was before it and after it. There are other factors acting too because of this, like Government regulations to push EVs, fluctuating raw material prices, consumers with no concrete sides to choose and a lot more. And all these changes go beyond boundaries therefore it affects India too in interesting ways, this study is all about The major challenges and structural changes reshaping the Indian automobile sector

This study uses a descriptive lens, to look into the effects of these evolutions and how the three major automobile firms in India, Maruti Suzuki, Tata Motors and Mahindra are coping with the changing environment. The study is entirely based on the Secondary data taken from the official websites of these companies and some other sources. The sales, cost, revenue and ratios are used to analyze.

The conclusion is that, like it or not, EVs will not go away. Traditional cars are becoming more and more expensive to produce, and are also plagued with other environmental issues. While EVs are not even close to perfect in the current state, they are still liked by progressive customers and the government alike, and are projected to grow immensely in the future.

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TABLE OF CONTENTS

S no.	Index	Page no.
1.0	Introduction	01
1.1	Problem Statement	01
1.2	Research Objectives	01
2.0	Literature Review	02
2.1	Challenges and Changing Landscape...	02
2.2	Types of Electrified Vehicles (EVs)	04
2.3	Levels of Vehicle Automation	05
2.4	Major Regulatory Pressures...	07
2.5	Battery Technology and Raw Material...	09
2.6	Consumer Preference Shifts	10
2.7	Impact of COVID-19 on the Automobile...	11
2.8	Industry 4.0 and Smart Manufacturing	12
2.9	Globalization vs Localization	13
3.0	Research Methodology	14
3.1	Research Design	14
3.2	Nature and Sources of Data	14
3.3	Tools and Techniques of Analysis	14
3.4	Scope of the Study	15
3.5	Limitations of the Study	15
4.0	Analysis	16
4.1	Sales Volume Trends	16
4.2	Revenue Trend Analysis	20
4.3	Cost Structure and Profitability	21
4.4	Ratio Analysis	22
4.5	Technological Transformation	24
4.6	Regulatory Impact	25
4.7	Consumer Behavior and Market Dynamics	25
4.8	Future of Indian Automobile Sector	26
4.9	Strategic Implications	31
4.10	Overall Findings	32

5.0	Recommendations	33
5.1	Accelerate Investment in EV Technology	33
5.2	Strengthen Localization and Supply Chain	33
5.3	Resilience	33
5.4	Build Consumer Trust	34
5.5	Affordable EV options	34
5.6	Develop Sustainable and ESG oriented strategies	34
5.7	Collaborate with Government & Tech Firms	34
	Adopt Data-Driven and Digital Marketing Strategies	
6.0	Conclusion	36
7.0	References	37

1.0 INTRODUCTION

1.1 Problem Statement

The automobile industry is in a state of continuous change, with innovations like EVs and Industry 4.0 and challenges like raw material shortages and Government interventions. If we narrow it down to India, people are very sensitive to price, the infrastructure is not the best and due to things being new, policies are not set in stone yet, which makes the global issues more intense. Which makes studying the amplified effect of these global changes in India very important and interesting.

1.2 Research Objectives

1. To identify the challenges in the automobile industry in India.
2. To analyse how firms deal with government policies and raw material costs, and their strategies around it.
3. To understand how EVs are changing the competition among firms in the automobile industry.

2.0 LITERATURE REVIEW

2.1 Challenges and Changing Landscape in the Automobile Industry

There are Three Primary forces changing the Automobile Industry: Electrification of Vehicles, Digitalization and Regulatory Pressures from the Government. These changes are related to each other and are together influencing how firms operate and compete.

When it comes to electric vehicles (EVs), The environmental benefits are immense but they are not the only consideration for an average buyer, The customers are also influenced by economic and infrastructural factors. High initial buying costs, inadequate charging infrastructure, and travel range limitations are currently the primary entry barriers for various customers. If we look at positives, Government incentives such as subsidies are encouraging EV adoption [Helveston et al., 2015]. The best case scenario for manufacturers now is to invest heavily in EV technology while balancing profitability in the short term.

Based on these factors, Daniel Sperling introduced the concept of the Three revolutions - electrification, automation, and shared mobility [Sperling, 2018]. These are the three forces converging together to alter the traditional automobile business models. Vehicle manufacturers are also entering the market of integrated mobility solutions. This emerging field is helping technology companies and new entrants to challenge established players. In response, Traditional auto manufacturers are also entering this space [Sperling, 2018].

Another crucial component is supply chain vulnerability, Semiconductor shortages lead to structural weaknesses in global automobile supply chains [Ivanov & Dolgui, 2020]. Electronic Components are an integral part of Modern vehicles, and production heavily rely on them. Their shortage results in production delays which further results in increased costs, and reduced operational efficiency. Firms try to combat this through

diversified suppliers, as multiple alternatives gives them more control over costs.[Ivanov & Dolgui, 2020].

In urban areas, the customers are much more progressive and break the stereotypes of the Indian market chasing prices. These customers do care about prices but they also care about the environment, issues surrounding security and other much complex issues. They are sensitive to the methods of production, the features of the cars, security standards, fuel and battery efficiency along other miscellaneous features like screens etc. These features are no easy feat for companies, they have to pour a lot of money into research and development and testing. It is still worth it and useful especially in the security improvements [Deloitte, 2022].

The digitization and AI business is creeping into yet another industry as well. Artificial Intelligence, Internet of Things (IOT), and big analytics are now starting to be used in operations of car manufacturing. These technologies are used with the aim of connecting all the parts of processes, trying to make things seamless. It is not as easy as it looks though. The investment cost is sky high, data privacy is an issue never resolved in these technologies, meaning these techs are not all good [Kamble et al., 2018].

As EVs start to appear into the scene, the government is trying to push aside the traditional vehicles, and probably for good reasons too. EVs are better for the environment, so it makes sense to push for them, and traditional vehicles have been notorious for air pollution and other environmental hazards for a long time now. The emission norms are now stricter as a result, which is starting to make ICE vehicles even more obsolete[International Energy Agency, 2023].

Globalization has now seeped into every industry, and the automobile industry is no different. The geopolitical factors affect the Indian industry as well. Policy changes from other countries have a domino effect on the operations here in India. The best companies can do is improve their local market to mitigate [Mckinsey & Company, 2021].

This is all perspective though, If you are on the right side, this could be a win as well. If companies switch to EVs all the regulations and Green processes are actually quite beneficial both for the people and the companies.

There are a lot of studies examining all the previously discussed issues in a vacuum. There is still a need and opportunity to study these elements together as they all run with each other and impact each other too. The companies involved, at the very least, should take all of them into account before making plans. And that will be their ticket to survival.

2.2 Types of Electrified Vehicles (EVs) [International Energy Agency (2023)].

Electric vehicles are generally put into four categories based on how they get their energy and how it's delivered to the wheels:

⁴ Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs), Hybrid Electric Vehicles (HEVs), and Fuel Cell Electric Vehicles (FCEVs).

2.2.1. BEVs- They're also commonly known as all-electric cars, and run entirely on electricity stored in their batteries with no gas engine to speak of.

Charging: They need an outside power source to charge up.

Some of the perks of BEVs include zero tailpipe emissions, higher fuel efficiency and instant torque.

Some popular examples are ⁸ the Tesla Model 3, the Ford Mustang Mach-E and the Nissan Leaf.

2.2.2. PHEVs- PHEVs have a mix of a battery powered electric motor and a gas engine.

Charging: You can plug them in to give the battery a charge, or they can use petrol.

Some of the features PHEVs offer include an electric only range of around 20-60 km (it usually varies by model), after which the gas engine takes over.

Some examples of PHEVs are the Toyota RAV4 Prime, the Ford Escape PHEV and the BMW 330e.

2.2.3. HEVs- These are often called conventional hybrids, and basically work by pairing ¹⁴an internal combustion engine with an electric motor that work together.

Charging: They don't need to be plugged in to charge; the battery gets a top-up through regenerative braking and the engine.

Some of the benefits are higher fuel efficiency than standard cars but they won't stay running on electricity for very long distances.

Some examples of HEVs are the Toyota Prius and the Honda Civic Hybrid.

2.2.4. FCEVs- FCEVs run on electricity from ⁶a chemical reaction between hydrogen and oxygen in a fuel cell stack - not from a battery, which is a bit different.

Refueling: you fill them up with hydrogen gas at one of those special stations.

Key Features: basically the only emission you get is water vapor, refilling is super quick, and generally they can go a lot further than BEVs.

Examples: the Toyota Mirai and the Hyundai Nexo, which are both FCEVs.

2.3 Levels of Vehicle Automation [SAE International (2021)]

Vehicle autonomy levels, in this case, go from Level 0 (nothing in the way of automation) to Level 5 (the complete automation).

In the first three Levels (0-2), you still have to keep an eye on the road as a human - the car is just helping out a bit. From Level 3 onwards, you can take your hands off the wheel - but that's still subject to some conditions [SAE International (2021)].

2.3.1. Level 0 (No Driving Automation): the driver has to do everything. Some modern cars still operate at this level, even with advanced safety features.

2.3.2. Level 1 (Driver Assistance): your car might have some fancy features like cruise control or a lane-keeper, but that's about it.

2.3.3. Level 2 (Partial Driving Automation): the car does a bit more, it can steer and control the speed, but the driver still has to keep an eye out for the road and be ready to take control if needed.

²
2.3.4. Level 3 (Conditional Driving Automation): the car **can** handle **all** the **driving tasks under certain conditions** (like going down **the** highway), and the **driver** is allowed to relax a bit but they still have to be ready to take over.

²
2.3.5. Level 4 (High Driving Automation): the car **can** automatically drive, but it is limited to a relatively small area like a highway or a geofenced zone, in case something is off, it is up to the driver to handle it.

2.3.6. Level 5 (Full Driving Automation): the car is fully automatic and is not limited by locations like level 4, no involvement from the driver is needed either.

Key Technologies Driving the Move Towards Automation are:

- Artificial intelligence (AI)
- Sensors: like LiDAR, radar, and cameras (These help the car in scanning its surroundings)
- Machine learning
- High definition mapping GPS systems
- Vehicle to everything (V2X)

Tesla and Waymo are two of the companies putting the most efforts in autonomous driving at the moment.

2.4 Major Regulatory Pressures & Government Policies in India

2.4.1. Emission Norms (Bharat Stage – BS VI)

On April 1st 2020, The government of India introduced new rules and regulations to combat air pollution production. These rules were supposed to replace the previous iteration BS IV. The new rules were pretty good as they did reduce around 68% PM, Diesel NOx and the sulphur in fuel to 10 ppm [Government of India, 2020].

BS VI is compulsory for all the automobile manufacturers in India, regardless of their scale of operations [Government of India, 2020].

BS VI is enforced on both four wheelers and two wheelers. It improved both by a significant margin. The issues that arose for both, however, were quite different because different components had to be altered. [Government of India, 2020].

The switch from BS IV to BS VI was the worst for four wheeler diesel cars. While it was not as much the changes were still significant in two wheelers, the manufacturers still had to remake a lot of engine designs to meet the new standards, If we look at each section separately:

For Two wheelers: The goal was to cut down on Hydrocarbons and Carbon Monoxide, to do this the air fuel mixture had to be more precise, which meant goodbye to carburetors, and replacing them with Fuel Injection systems.

For Four wheelers (Diesel): The change was the most complex and tedious in this case. To neutralize NOx, ⁵ Diesel Particulate Filters (DPF) and Selective Catalytic Reduction (SCR) served different purposes.

For Four wheelers (Petrol): Here, The change was not as complex as Diesel variants, but still required better catalytic converters and Engine Control Units. The Nox limit was 60 mg/km.

The changes took a toll on prices, The changes led to an increase ranging from 10 to 15% of price. It was no surprise that the jump was highest in diesel cars due to the much more complex changes implemented. Sometimes the price even jumped in lakhs for diesel cars.

BS VI is a lot more smoother in comparison but BS IV peaked more in performance this was the exchange for air quality.

2.4.2. FAME India Scheme (FAME I & FAME II)

The Indian Government is in active support of EVs, to push for EV adoption they came up with two iterations of FAME, both to serve different purposes. FAME I was active from 2015 to 2019 and was related to the technological part. After that FAME II was introduced in 2019 to focus on Public transports like buses and also to improve the infrastructure for all EVs [Government of India, 2019].

2.4.3. Ethanol Blending (E20 Policy)

On April 1, 2026, India launched a scheme initially planned for 2030, early. E20 fuel was to be used nationwide. This move is all about energy security and emission reduction, and helps reduce expensive crude oil imports, saves foreign exchange, and gets a much needed boost in the arm for the agri sector. But, this policy does require vehicles to be compatible and there's a slight risk to fuel efficiency of around 3-4%.

Vehicles sold from April 2023 were designed to be E20 compliant, but the older ones may have some issues with compatibility [Government of India, 2026].

2.4.4. Vehicle Scrappage Policy(2021)

India's Vehicle Scrappage scheme (2021) calls for periodic fitness tests for all personal vehicles that are more than 20 years old and commercial vehicles older than 15, before directing any that don't make the cut to registered scrappage centers with the aim of reducing air pollution and improving road safety [Government of India, 2021].

Vehicles which flunk the automated tests (at the R.V.S.Fs) after 15-20 years get marked as End-of-Life Vehicles (ELVs).

To get a Certificate of Destruction you need to have your vehicle destroyed at a properly authorized Registered Vehicle Scrapping Facility (RVSF)

In Delhi/NCR though, the rules are tougher - straight from the get go, any ³ diesel vehicle older than 10 years or petrol vehicle older than 15 years gets impounded.

This whole thing has actually driven up demand for new cars which has inevitably been a boon for the manufacturers.

2.5 Battery Technology and Raw Material Dependency

The push towards electric mobility has turned battery tech into a hot area of research in the car industry. The most used type of battery that is used in cars is lithium ion. These batteries have a long life, have a great range of distance covered in one full charge and are generally coming down in price, making them The perfect choice. But their over dependency has increased the value of minerals like lithium, cobalt, graphite and nickel [Schmuck et al., 2018].

Richard Schmuck and his partners gave some of their insights on the public's perception of EVs. According to them, customers want the battery to travel long distances in one charge, but it should also not negatively influence the performance of the battery. This makes it clear to see why lithium batteries are so popular, since they actually cover a lot of these points except maybe the performance, as they lack a little as of now, Not to mention the issues related to materials becoming scarce [Schmuck et al., 2018].

The issues become worse when you realise that there are only a handful of countries actually concentrated with lithium refining and battery production, one of them being China. This lack of options creates vulnerabilities for manufacturers globally. Price fluctuations and Trade restrictions become very common under these conditions [Rezvani et al., 2015]

As good as these batteries are, the mining of these batteries has big environmental and labour issues. The production takes a lot of water usage, leads to pollution and exploits the labour to give out the final product. Recycling and reuse is therefore very important.

2.6 Consumer Preference Shifts

People and their perspectives have changed over the years. Initially people only looked at the cheaper alternative for decisions but now people are much more complex. They want to try out all the new features that were considered luxuries in the past. Beyond just basic features, they also look into stuff like production methods of companies to choose companies that care for the environment [Rezvani et al., 2015].

Conservative customers are also changing their views on EVs. In the early stages of EVs a lot of people considered them inferior to traditional cars, since they did not have the engine sound or the power of ICE vehicles. Now though, people are accepting EVs not only because they are more powerful now, but also because people are starting to see the value of improving the environment over their own preferences [Rezvani et al., 2015].

The way people get around is changing, people are moving from wanting to own a car to wanting to just be able to get in and go with services like Uber or a car subscription service. This means that the car makers have to compete not just on the quality of the cars they make but also on the service around those cars. Consumer preference shifts are forcing car makers to re-design their products, upgrade their digital offerings, and make their brand all about being green.[Rezvani et al., 2015].

People and their tendency to accept EVs is also based on how serious of an issue they consider climate change. More progressive customers are more than willing to accept the tradeoffs.

2.7 Impact of COVID-19 on the Automobile Industry

The COVID-19 pandemic absolutely changed the global automobile industry, laying bare the industry's weak spots in supply chains and the way the whole thing works [Ivanov & Dolgui, 2020]. The pandemic was a bit of both, a wild disruptor and a force that just accelerated the changes that were already happening in the industry.

Even though all types of business were affected by lockdown, the Automobile industry was arguably in the worst condition by far. Factories were shutdown, there was nationwide lockdown, and a lot of transportation restrictions on top of it. And at the worst time the industry was hit with a semiconductor shortage, increasing costs. This was probably the biggest challenge the car market faced ever.

The demand for cars during the pandemic was weird and uncertain. Everyone was staying at home, and they were not allowed to leave, why would they ever even think about buying one. The future of the whole world was uncertain, let alone the automobile industry. Some researchers did argue that, when everything was settled, people actually preferred to buy their own cars over using public transport [Ivanov & Dolgui, 2020].

The pandemic was one the lowest lows for the industry but it still led to some positives [Ivanov & Dolgui, 2020]. Lockdown forced digitization of a lot of things throughout almost all the industries, including the automobile industry. A lot of automations were done and some online platforms were also made.

The less privileged side of the industry was hit the hardest, since bigger companies had a lot of money, they had the luxury to wait and let the storm pass. A lot of smaller companies were not given that choice.

Either way, the pandemic showed us all just how important it is for car makers to be able to roll with the punches and stay competitive [Ivanov & Dolgui, 2020].

So, all in all, COVID-19 was a bit of a game-changer for the auto industry (more of a long-term impact rather than a short-term problem.)

2.8 Industry 4.0 and Smart Manufacturing

As mentioned above, the industry started shifting towards better use of technology, which ultimately led to the 4th industry revolution or Industry 4.0. It is a concept that covers pretty much all the parts of the production and operations and transforms them through concepts like IOT, robotics, automation etc.[Kamble et al., 2018].

A lot of the research suggests that Industry 4.0 is one of those elements that will turn a factory into a "smart factory". This smart factory will connect everything so seamlessly that it will feel like the machines are talking to each other. This will improve production, maintenance, quality control and everything else. Not only that it will also help in data collection and use, making it easier to react to market issues [Kamble et al., 2018].

Well, a connected thread of machines is of course helpful, but Industry 4.0 is also good at precisions in manufacturing, managing the inventory and making it possible to add special customizations. And the connection between machines in of itself makes spotting and fixing the issues easier when they arrive.

While the features are certainly very attractive, so is the price, especially in India, which is currently lagging behind the world. There is no proper digital infrastructure here, which is going to increase costs even further, cybersecurity is not taken seriously and workers are not trained yet to deal with all these complex things that come along with industry 4.0 [Kamble et al., 2018].

Employment is already abysmal in India, and industry 4.0 will most definitely make it even worse. Automation by concept runs into this problem of making more and more humans unemployed, which makes you wonder if all this progress is even worth it.

In essence, industry 4.0 is way more than just an addition to the current state of production, it is actually almost a new iteration of it, and it will take a lot of cost and time to implement it.

2.9 Globalization vs Localization

The automobile industry has always thrived in the global network, it is about covering the distance after all when it comes to automobiles. Various big companies always look to set up their productions overseas all the time. But recently trends are shifting a bit, especially in India.

When it comes to India, a lot of researchers argue that India has started over relying on imports and globalization has made the production more vulnerable. Trade barriers, material shortage, pandemics and other issues are no surprise in such an industry [Society of Indian Automobile Manufacturers, 2025].

As a result, The Indian government is trying its best to make the country self-reliant. The government is offering incentives to local suppliers to create an environment where imports won't be needed as much anymore. PLI and Make in India are some of the examples [Society of Indian Automobile Manufacturers, 2025].

3.0 RESEARCH METHODOLOGY

3.1 Research Design

This is a descriptive study, and uses secondary data to understand the new trends in the Indian automobile Industry. Records related to cost, sales etc. are analysed to figure out the impact of these trends on the big firms in the industry.

The firms also react differently to these trends, which is another focus of the study to see different marketing campaigns and strategies used by companies to compensate for the extra costs and conservative mindset of consumers.

3.2 Nature and Sources of Data

The research only uses secondary data for analysis, The source of the data is as follows:

- Official websites of Tata Motors, Maruti Suzuki and Mahindra.
- Industry reports of Society of Indian Automobile Manufacturers.
- Government policy documents.
- Other websites and blogs.

3.3 Tools and Techniques of Analysis

3.3.1. Quantitative Analysis

1. Trend analysis to study sales and costs.
2. Ratios such as Profit margins and EBIT.
3. Comparative analysis across firms.

3.3.2. Qualitative Analysis

1. Study of Marketing campaigns and other Strategies.

3.4 Scope of the Study

The study is limited to:

- Big players in the Indian Automobile.
- Major Trends such as EVs

- Secondary data

3.5 Limitations of the Study

1. There is limited control on the data and its authenticity since the source is Secondary.
2. Consumer perception cannot be directly measured with secondary data.
3. Companies don't disclose all of their data.
4. Data is time sensitive in the current environment.

4.0 Analysis

These three firms have different priorities and goals:

1. Maruti Suzuki is the current market leader, mostly operating in ICE vehicles and is stepping gradually in EV
2. Tata Motors has EV as the major focus, which means aggressive investment costs.
3. Mahindra & Mahindra is famous for SUVs but they are also starting to make popular Stylish EVs like BE6.

4.1. Sales Volume Trends

4.1.1. Maruti Suzuki

- Strong pre 2020 growth
- Decline during COVID period
- Moderate recovery post 2022
- Slower growth in EV segment

Table 4.1 Total Sales

Financial Year	Total Vehicle Sales	Growth Rate
FY 23	1,966,164 units	—
FY 24	2,135,323 units	8.6%
FY 25	2,234,266 units	4.6%

Source: marutisuzuki.com

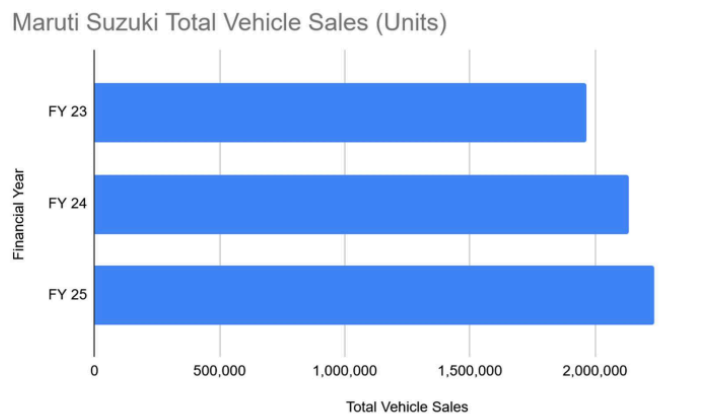


Figure 4.1 Maruti Suzuki Total Vehicle Sales

Source: marutisuzuki.com

4.1.1.1 Learnings

Maruti Suzuki is still a market leader when it comes to the passenger vehicles, even the pandemic did not stop the sales growth.

The Growth soon went down a bit in FY 25 as:

- Demand is dropping for entry level affordable vehicles.
- Introduction of EVs made the competition with SUVs even worse.
- With increasing income and passion, people are switching to premium vehicles.

To compensate for this dip, Maruti focused on exports and had good growth there.

4.1.2. Tata Motors

- Significant growth post 2021
- Introduction of famous EVs like Nexon
- Increasing domestic market share

Table 4.2 Passenger Vehicle sales

Financial Year	Passenger Vehicle Sales	Growth Rate
FY 23	~553,000 units	—
FY 24	573,541 units	~4%
FY 25	Further growth led by EVs	Positive

Source: tatamotors.com

4.1.2.1 Learnings

Tata Motors was amazing in:

- Electric vehicle adoption
- SUV demand

Cars like Nexon EV and Tiago EV were huge successes, and they were also supported by government incentives.

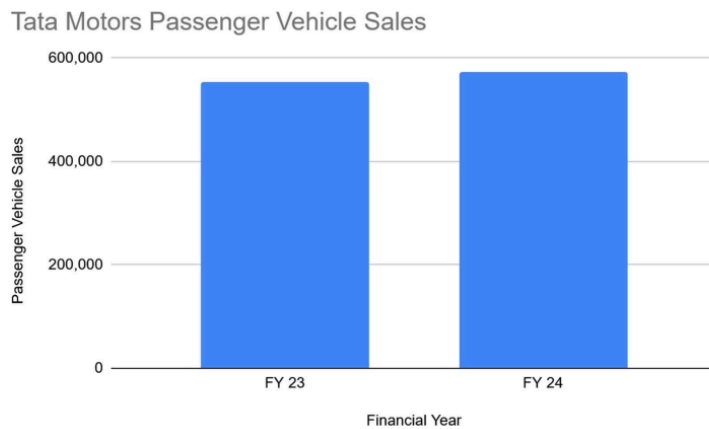


Figure 4.2 Total Passenger Vehicle sales

Source: tatamotors.com

4.1.3. Mahindra & Mahindra

- Stable but slower growth
- Very Popular SUVs like Thar and Scorpio
- Not deep into EV yet, but a strong start with BE6

Table 4.3 Domestic Vehicle Sales of Mahindra

Financial Year	Domestic Vehicle Sales	Growth Rate
FY 24	824,939 units	18.3%
FY 25	906,406 units	13.3%

Source: mahindra.com

4.1.3.1. Learnings

The growth is positive, and the reasons are:

- Loved SUVs like Scorpio, Thar, and the XUV series
- Aside from just passenger vehicles, Mahindra has a lot of cars used in Utility
- Improved production capacity

In isolation, SUV cars alone grew by ~20%. As mentioned before, customers are switching to premium cars now.

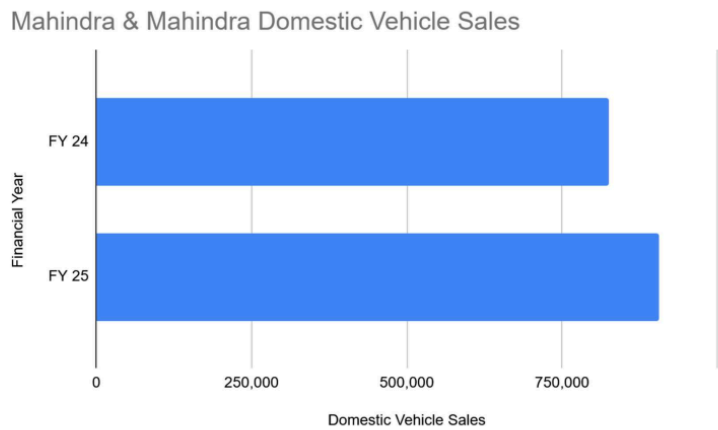


Figure 4.3 Mahindra Domestic Vehicle Sales
Source: mahindra.com

4.2. Revenue Trend Analysis

Table 4.4 Revenue Growth

Company	FY 24 Revenue	FY 25 Revenue	Growth Trend
Maruti Suzuki	1.35 lakh crore	1.45 lakh crore	Moderate
Tata Motors	4.38 lakh crore	Continued growth	Strong
Mahindra & Mahindra	1.01 lakh crore	Increased Further	Strong

Source: tatamotors.com, marutisuzuki.com, mahindra.com

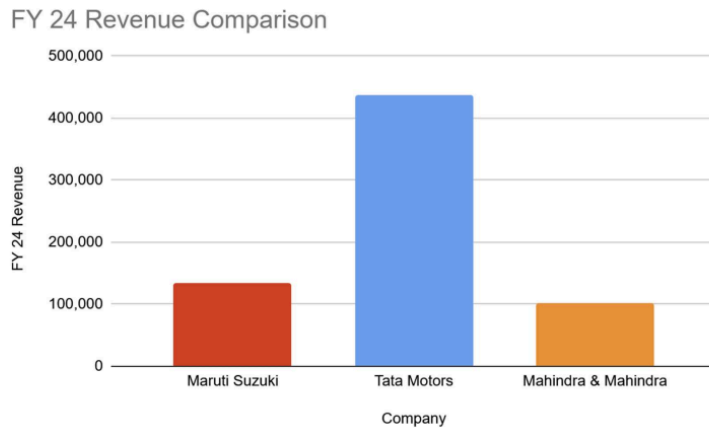


Figure 4.4 Revenue Comparison

Source: tatamotors.com, marutisuzuki.com, mahindra.com

4.2.1. Learnings

Tata Motors has the highest revenue, reasons are:

- Jaguar Land Rover(JLR) operations
- EV business expansion
- Commercial vehicle segment

The over dependence on ICE vehicles is slowing down Maruti Suzuki in the race

Mahindra has big margins as they are dealing with premium vehicles as their first priority.

4.3. Cost Structure and Profitability

Major Industry-Wide Cost Drivers

- Semiconductor shortages
- Costs are unstable for steel, aluminium and lithium
- BS-VI compliance costs
- EV R&D investment
- Supply-chain disruptions

Table 4.5 Cost Trend

Company	Cost Trend	Impact
Maruti Suzuki	Moderate Increase	Stable Margins due to scale efficiency
Tata Motors	High Increase	Short-Term pressure but Long-Term Growth
Mahindra & Mahindra	Controlled Increase	Balanced Profitability

Source: [Reuters, 2025].

Table 4.6 Pressure behind costs

Company	Major Pressure
Maruti Suzuki	Commodity costs + Discounts
Tata Motors	Raw material + EV investment
Mahindra & Mahindra	Capacity Expansions

Source: [Reuters, 2025].

Tata has low margins and high costs, thanks to their heavy investment in EVs, These costs will probably reap them rewards in the long run as they now have the first mover advantage, making this cost a high risk and high reward situation, their profit is also hit a little due to the raw material costs.

4.4. Ratio Analysis

4.4.1. Net Profit Margin

Formula:

$$\text{Net Profit Margin} = \text{Revenue/Net Profit} \times 100$$

Table 4.7 *Net Profit Margins*

Company	FY 24 Margins	Interpretation
Maruti Suzuki	~9.8%	Strong Operational Efficiency
Tata Motors	~7-8% (Consolidated)	Improving after Restructuring
Mahindra & Mahindra	~10-11%	Strong SUV profitability

Source: tatamotors.com, marutisuzuki.com, mahindra.com

1. Premium vehicles are giving the best margins to Mahindra.
2. Maruti is old and well established, their economies of scale is giving them stability.
3. Tata Motors has low margins, they are focused on EVs and are incurring extra costs because of it.

4.4.2. Revenue Growth Rate

Formula:

Growth Rate = $\frac{\text{Current} - \text{Previous}}{\text{Previous}} \times 100$

Table 4.8 *Growth rate*

Company	FY 24 Revenue Growth
Maruti Suzuki	~20%
Tata Motors	~26% (Consolidated)
Mahindra & Mahindra	~17%

Source: tatamotors.com, marutisuzuki.com, mahindra.com

Tata is leading, The Investment in EV might be paying off along with other Factors:

- Recovery in JLR
- EV growth
- Premium product strategy

4.4.3. EBITDA Margin

Table 4.9 EBITDA margin

Company	EBITDA Margin Trend
Maruti Suzuki	Declined slightly due to rising costs.
Tata Motors	Improved significantly Post pandemic
Mahindra & Mahindra	Stable and Improving

Source: tatamotors.com, marutisuzuki.com, mahindra.com

Tata Motors' EV investment makes their product mix tough to beat, they are also restructuring their operations.

4.5. Technological Transformation

Findings:

1. Tata Motors is a first mover in the EV scene, the high initial costs now gives them competitive advantage.
2. Mahindra & Mahindra is evolving their EV era with success.
3. Maruti Suzuki is still hesitant and instead of going full EV are starting with Hybrids.

Early investment costs are very likely worth it, as they give benefits in new risky segments.

Electrification is starting to matter as a competitive tool.

There is High growth potential in new tech.

4.6. Regulatory Impact

BS VI, FAME II and PLI schemes are the current focus for the companies.

Impact

- Tata Motors is able to bypass or benefit from a lot of these, because of EVs.
- Maruti Suzuki is the contrast, and because of Traditional Cars is incurring more costs.
- Mahindra & Mahindra is somewhere in the middle with gains and losses.

Policies are give and take, with benefits and hindrances.

Compliance is helping innovation but not for free.

4.7. Consumer Behavior and Market Dynamics

4.7.1. Tata Motors

All three companies are in different situations, and the way they are dealing with the consumer perception is also different because of it. For Tata, they are currently the leader in EVs in India especially at an affordable price, Negative Consumer perception will affect them the most. To turn around the more conservative customers they show off low maintenance costs (in comparison to ICE), green benefits of EVs, and the easy usage of EVs (no gear shifts) in their advertising. If we look specifically at Tiago EV and Nexon EV the focus was:

- Low charging costs compared to Petrol
- Environmental responsibility
- Modern technology
- Good battery distance range

The campaigns have been quite successful so far, as they target middle class urban consumers, and they are happy with the low costs and environmental benefits.

4.7.2. Mahindra & Mahindra

Unlike Tata, Mahindra cares more about the customers that can afford premium cars, so instead of focusing on the costs, they focus more on the features of the cars and more importantly the stylish designs of their cars. BE6 is one of the better designed cars from India, other companies are starting to make their designs more and more uninteresting, BE6 feels like a breath of fresh air in between all those similar looking cars, It's no surprise that this strategy seems to be succeeding.

4.7.3. Maruti Suzuki

Maruti Suzuki, is not really that deep into EVs yet, but still they are somewhat active in the discussion through hybrid cars. Their strategy seems to be switching into EVs when the infrastructure is stronger for battery charging and such. Their focus here is not much different from their approach with traditional cars, which is low prices, reliability and their network of service centers.

It seems like in the current scenario, Consumer perception fragile and depends on factors like:

1. Pricing strategies
2. Infrastructure development
3. Brand trust
4. Features and Style

4.8. Future of Indian Automobile Sector

4.8.1. CAGR Estimate

According to industry estimates, the Indian automotive market was approximately:

- 5.16 million units in 2024
- Expected CAGR: 7.3%

This CAGR reflects:

- Rising disposable income
- SUV demand
- EV adoption
- Government support
- Urbanization and infrastructure growth

4.8.2. Projections

Formula:

$$FV = 5.16 \times (1.073)^n$$

Table 4.10 Projections of Market size

Year	Projected Market size (million units)
2024 (Base Year)	5.16
2025	5.94
2026	5.95
2027	6.38
2028	6.85
2029	7.35
2030	7.89-8.36

Source: [Grand view research, 2024].

The Indian automobile industry is projected to approach approximately 8 million+ units by 2030, indicating strong long-term structural growth driven by electrification, premiumization, and rising domestic demand.

4.8.3. Passenger Vehicle Segment

Passenger vehicle sales in India were approximately:

- 4.1 million units in 2023
- Expected CAGR: 5.6% till 2030

Table 4.11 Projections of Passenger Vehicle sales

Year	Passenger Vehicle Sales (Million units)
2023 (Base Year)	4.10
2024	4.33
2025	4.57
2026	4.83
2027	5.10
2028	5.39
2029	5.69
2030	~6.00

Source: [Globenewswire, 2025].

Passenger vehicle growth is expected to be supported mainly by:

1. SUVs
2. Premium vehicles
3. EV adoption
4. Improved financing availability

4.8.4. SUV Segment

Studies indicate SUVs are likely to remain the fastest-growing passenger vehicle category in India.

Drivers:

- Consumer preference for larger vehicles
- Better road infrastructure
- Premiumization trend
- Increased rural and semi-urban demand

Projected Automobile Market size and Passenger Vehicle Sales

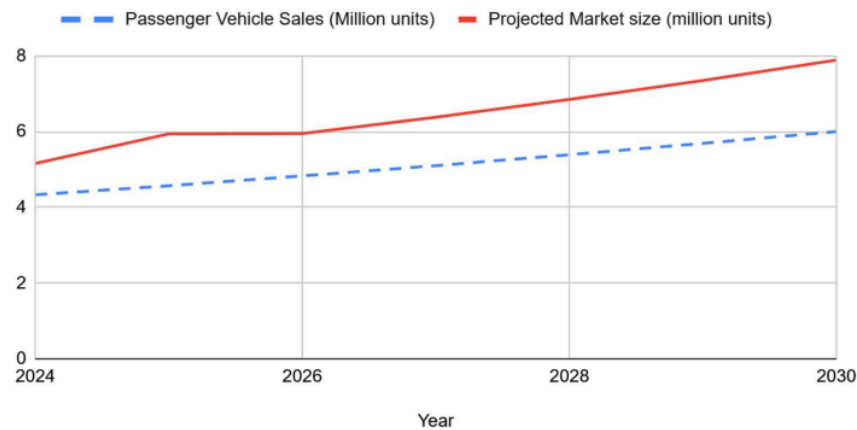


Figure 4.5 Projected Automobile Market size and Passenger Vehicle sales
Source: [Globenewswire, 2025].

4.8.5. EV Market

The Indian EV market is projected to grow at:

- CAGR ≈ 40.7% (2025–2030)
- 2024 EV market value = USD 8.49 billion

Table 4.12 EV market value estimates

Year	Estimated EV market value (USD billion)
2024	8.49
2025	11.95
2026	16.82
2027	23.67
2028	33.31
2029	46.88
2030	~66.00

Source: [Grand view research, 2024].

Estimated EV market value

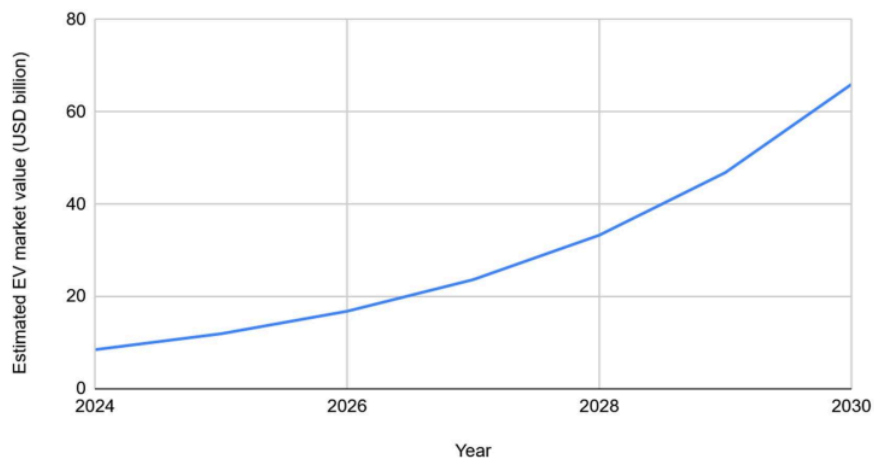


Figure 4.6 EV market value projections

Source: [Grand view research, 2024].

The EV segment is expected to grow substantially faster than the overall automobile industry due to:

1. Government subsidies
2. Battery cost improvements
3. Charging infrastructure expansion
4. Sustainability awareness

4.9. Strategic Implications

4.9.1. For Automobile Companies

Firms will need:

1. Higher investment in EV technology
2. Localization of battery supply chains
3. Smart manufacturing capabilities
4. Product diversification

4.9.2. For ICE Dominant Firms

Companies heavily dependent on internal combustion engine vehicles may face:

1. Margin pressure
2. Regulatory compliance costs
3. Market-share risk in EV transition

4.9.3. For EV Focused Firms

Companies with strong EV strategies may gain:

1. Long-term competitive advantage
2. Policy incentives
3. Urban market leadership

4.10. Overall Findings

The quantitative and qualitative analysis suggests that the Indian automobile industry is transitioning toward:

1. Electrification
2. Premiumization
3. Digital transformation
4. Localization of production

Key strategic observations:

1. EV-focused firms are gaining long-term positioning advantages.
2. ICE-dependent firms face increasing transition pressure.
3. Supply-chain resilience and technological investment have become critical success factors.
4. Consumer demand is currently fragile and should be handled thoughtfully.
5. The Indian Automobile Industry is in no way going to stop growing and if anything, EVs will boost it further.
6. EVs are going to take a lead over Traditional Vehicles in growth.
7. SUVs and premium vehicles are seeing more demand going forward.
8. Firms not adapting adequately to Electrification are going to lose in the long term.
9. Tata Motors' EVs thrive in urban areas due the progressive views of customers, Maruti captures rural and middle class market, and Mahindra is good at making stylish and premium cars for passionate customers.
10. Consumers are starting to like Tech + Green, but the Indian market is still sensitive to price.
11. EVs are leading the Urban markets and SUVs are good in the mass market.

5.0 RECOMMENDATIONS

5.1. Accelerate Investment in EV Technology

Companies have to go beyond just investing in their EVs, they also have to focus on the supporting pillars of the technology. Investing in research to find better tech for batteries that is less damaging to the environment and people, making more charging stations are good first steps.

For the other companies which have nothing to do with EVs yet, might be forced into it to survive. They should probably start by making slow initial steps, like how Maruti is doing with hybrid cars and eventually make big steps down the line.

5.2. Strengthen Localization and Supply Chain Resilience

Even after all the Make in India efforts, India is not really self reliant yet, The raw material source is still outside countries. Until that is resolved, The companies can:

1. Increase the Supply routes to increase the power of choice.
2. Bring in more local suppliers
3. Invest in efforts towards making India more self reliant.

This can not eliminate the entire problem of course, but this is definitely the least they can do, In the current scenario.

5.3. Build Consumer Trust

The public has not completely bought the idea of EVs yet, They are skeptical, The companies can help by:

1. Marketing campaigns educating the customers.
2. Showcasing the long term cost benefits of EVs
3. Making promising progress towards better infrastructure and safety.

They also need to address genuine concerns of customers related to the range of EVs being low at times, the huge costs of battery replacement and their longevity.

5.4. Affordable EV options

As mentioned multiple times, India has always been a very price sensitive market. To survive in this market and to make EVs more accepted, the best bet is always making them more affordable. The companies, however, should not take the easy way out by making the cars worse, they should still make them safe and up to standards.

5.5. Develop Sustainable and ESG-Oriented Strategies

Companies can also focus on sustainability to please the urban fans:

1. Cut carbon emissions
2. Ethical and green manufacturing process
3. Improve battery recycling systems
4. Enhance ESG disclosures

People are aware of all the issues related to both Traditional cars and EVs, manufacturers should take responsibility and make a change.

5.6. Collaborate with Government & Tech Firms

All the positive changes are too much to bear for a single company. It has to be a collective effort to change the world for the better. Companies have to play to their strengths together, that is Government and Private companies working together to improve the shortcomings.

5.7. Adopt Data-Driven and Digital Marketing Strategies

Currently, Customers are not sure about their stance, To keep up companies can:

1. Improve their digital engagement
2. Personalize marketing campaigns

3. Get more active on social media
4. Improve Customer Experience

6.0 CONCLUSION

Beyond everything, one thing that is certain is that the introduction of EV is no small thing, there is a clear before EV, and after EV that has forever changed the automobile industry. Every part of the manufacturing process has changed from the start to the very end. The companies are forced to be more flexible with their plans and ideas, they have to scrap some and keep the others to keep evolving with the issues. Customers are also reflecting these changes in their demand. It is becoming clear that Tata was farsighted and sealed the opportunity, a risk which, in the end, paid off for them. Maruti, as of now, is running parallel to them and are still hesitant on switching sides, their years of experience and place in the market gives them the privilege to be sceptical and slow paced, which is not the luxury of smaller firms.

The government has definitely picked a side to follow, and it is definitely not the traditional route, based on their policies, definitely giving one side the advantages while taking away from the other. They are not wrong for doing so as they are trying to cut on pollutants and other issues, and EVs seem to solve a lot of that, it makes sense to support it and the companies surrounding it.

Customers are not out of the loop at all, in any of this. While a lot of the Indian customers are still choosing the cheaper option, it is much more complex than that. They still care a lot about the safety of the environment and themselves, they still look for style and features, at least a big portion of them. The better the companies make their lives, the more successful they will be.

The major challenges and structural changes reshaping the Indian automobile sector

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