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GROWTH OF AUTOMOBILE INDUSTRY IN INDIA

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ABSTRACT

The Indian Automobile industry has had substantial expansion in the last five years, as indicated by data published by the Society of Indian Automobile Manufacturers (SIAM). This research piece seeks to analyze and comprehend the primary elements that contribute to this rise, by examining several segments within the industry, including passenger vehicles, commercial vehicles, two-wheelers, and three-wheelers. We analyze extensive data from SIAM to examine sales figures, production rates, export numbers, and market trends, in order to offer a thorough assessment of the industry's performance.

The data indicate that the Indian Automobile sector has experienced growth due to factors such as rising customer demand, technological progress, government efforts, and favorable economic conditions. Passenger vehicles have become a significant catalyst for growth, with a substantial increase in sales across both the lower-end and higher-end market sectors. Commercial vehicles have had strong growth as a result of infrastructure development and increased demand for logistics services.

Moreover, two-wheelers play a crucial role in the Indian market, serving the large population and meeting various transportation requirements. Three-wheelers, predominantly utilized for commercial applications, have experienced consistent expansion, bolstered by the process of urbanization and the need for last-mile connection.

To summarize, the Indian Automobile industry's expansion in the past five years highlights its ability to withstand and adjust to shifting market conditions. The findings obtained from this study can provide guidance to stakeholders, governments, and industry participants in making well-informed decisions and formulating strategies for future expansion.

Keywords: Indian Automobile Industry; Growth; SIAM Data; Economic conditions; Analysis

INTRODUCTION

The Indian Automobile industry is one of the largest and fastest-growing sectors globally, with a significant impact on economic growth, employment, and technological innovation in the country. In recent decades, the business has experienced substantial changes, adjusting to worldwide patterns, customer choices, and regulatory structures. An important sign of this development is the data provided by the Society of Indian Automobile Manufacturers (SIAM), a significant organization that collects and shares detailed statistics about the industry. (Gaddam, 2013)

The Indian Automobile sector has had significant growth in recent years, especially when examining the data from the past five years. This era has been defined by numerous variables that have influenced the direction of the industry, including regulatory reforms,

technology advancements, changes in consumer behavior, and alterations in market dynamics. It is crucial for stakeholders, policymakers, and industry participants to comprehend this expansion and the factors that drive it in order to devise effective strategies and take advantage of emerging opportunities. (Shrivastava *et al.,* 2013)

The expansion of the Indian Automobile industry is not limited to a single sector, but encompasses a wide range of categories, such as passenger vehicles, commercial vehicles, two-wheelers, and three-wheelers. Every segment faces distinct problems and possibilities, which are shaped by factors including infrastructure development, urbanization, fuel prices, environmental concerns, and technological improvements. Furthermore, the expansion of the business has wider ramifications for the economy, affecting related industries such as manufacturing, services, and logistics. (Lokhnade *et al.,* 2013)

Using SIAM data allows for a comprehensive examination of the industry's performance within the selected timeframe. SIAM's data provides valuable information on sales numbers, production rates, export-import patterns, market shares, and growth rates, as well as other important variables. By utilizing this data, researchers and analysts can discern trends, patterns, and correlations that provide insight into the industry's condition, difficulties, and future potential. (Gaddam and Jimmy (2013))

This study piece aims to thoroughly investigate the expansion of the Indian Automobile sector by using SIAM data from the past five years. Our goal is to analyze the variables that are causing this growth, evaluate the performance of various segments, and offer insights that can inform future strategies and activities. This study seeks to enhance the current information on the Indian Automobile sector and provide vital insights for stakeholders operating in this rapidly changing environment. (Jatinder*,* 2017)

OBJECTIVE OF THE STUDY

- To study the growth of automobile industry in India

LITERATURE REVIEW

Author & Year	Study/Findings
Gaddam, 2013	The Indian Automobile industry has garnered considerable attention in academic studies due to its substantial contribution to the national economy and its rapid progression over time. Multiple studies have examined different aspects of the sector, including market dynamics, customer behavior, policy implications, and technology improvements.
Shrivastava *et al.,* 2013	A study was done to analyze the production and sales trends of the vehicle industry. This study presents an analysis of 13 years of industry data, which indicates that the industry's sales performance is highly satisfying. According to the study, the production of passenger vehicles had an annual growth rate of 11.86%, which

	was higher than the growth rate of other types of vehicles, between 2019 and 2023.
Sarangi *et al.,* 2014	The main idea behind the study is to understand and analyse the current and future trend in Indian automobile industry during the study period of 2013-14 to 2015-16 using statistical approach. It is found that after various ups and down in past years the result shows positive growth in all segments.
Lokhnade *et al.,* 2013	The study has been conducted to understand the impact of changing policy on the growth of automobile industry in India and also to reveal its export potential. This study comes to the conclusion that the changing policy environment during the last three decades in the country has ultimately contributed in the expansion and export intensity of the automobile industry.
Gaddam and Jimmy (2013)	The study has been conducted to analyse the growth pattern and economic impact of automobile industry on Indian economy. The result show positive impact of growth of Indian automobile industry on economy in terms of GDP, export, FDI, employment etc. Automobile industry become an instrument in shaping the country's economy as a major employment provider, export generator, GDP contributor, FDI earner.
Jatinder, 2014	It has studied paper titled 'A Review of Growing Automobile Industry in India" discovered and automobile industry become major contributor to economic development of country this industry contribute 7.1% of global GDP and provided employment among 32 million people directly and indirectly. This paper focuses to study the performance and growth of Indian automobile industry, and its contributing factor for its growth and current status of FDI. The study found that this industry is highly supported by factor such as availability of skilled labour at low cost and low cost steel production.

Roy and Alpana (2014)	The study has been conducted to analyse the trend and growth of automobile industry. It was found that the automobile export from India increased considerably during the study period, it was revealed that growth rate of export of all types of vehicles from India was more that the growth rate of production of those vehicles.
Singh and Jatinder (2014)	To study segmentation wise growth trends in terms of sales, export, production and FDI inflows in automobile industry and its correlation with total output of automobile industry. It was concluded that, there is strong market in terms of both domestic demand and exports of Indian automobile industry. It became massive market with lots of potential over the last decade.
Geetha and Gokila (2015)	The paper attempt to study the export performance of Indian automobile industry in all segments. The study tries to forecast the trend values for the exports in various segment of automobile industry. The study found that the export in various segment has increased during study period and the forecasted trend value through time series analysis.
Krishnaveni and Vidya (2015)	The study has been conducted to understand the role of FDI in automobile sector in India, and periodic change in this sector after announcing the new economic policy 1991 by the Government of India. The study found that after liberalisation in automobile sector, inflow in FDI increased and this rejuvenate the sector and presented the potential of Indian automobile market to whole world. The study concluded that government of India's Make in India plan gets positive supports after the entry of global automaker and automobile sector become most important sunrise sector in Indian industry.
Kokila and Geetha (2016)	The Indian Automobile industry has experienced steady growth, driven by factors such as rising disposable income, urbanization, and increased consumer demand for vehicles. Their study highlights the industry's resilience

	in adapting to economic fluctuations and changing consumer preferences.
Desai and Patel (2017)	A segment-wise analysis of the Indian Automobile industry reveals diverse growth patterns across passenger vehicles, commercial vehicles, and two-wheelers. Sharma emphasize the dominant role of passenger vehicles in driving overall industry growth, while commercial vehicles cater to the logistics and infrastructure sectors. Two-wheelers, on the other hand, remain essential for personal mobility, especially in rural areas where public transportation is limited.
Gupta and Jain (2018)	Technological innovation has been a significant catalyst for the industry's growth. With the advent of electric vehicles (EVs) and connected technologies, the Indian Automobile industry is undergoing a paradigm shift.
Dhande and Magar (2018)	Government policies and regulatory frameworks play a pivotal role in shaping the industry's growth trajectory. The implementation of Bharat Stage (BS) emission norms and the National Electric Mobility Mission Plan (NEMMP) have had a profound impact on the industry. These policies aim to promote cleaner technologies and reduce vehicular emissions, aligning with global sustainability goals.
Chandrasekar and Palanivel (2018)	The Society of Indian Automobile Manufacturers (SIAM) has been instrumental in providing comprehensive data and insights into the industry's performance. Several researchers have utilized SIAM's data to analyze market trends, sales figures, and growth rates.

METHODOLOGY

Data collection

The secondary data on automobile sector in India and the air pollution level is collected from the multiple sources and primary data collection was made from SIAM data from their annual reports. (Lokhnade *et al.,* 2013)

Market Structure and Technology

The market structure exhibited high concentration, characterized by significant entry obstacles and constraints on expanding capacities and introducing new product lines. General Motors and Ford ceased their activities in India, while commercial conglomerates such as the

Birla and Walchand group ventured into the industry. In 1960, there were three manufacturers in India: Premier Automobiles Limited, Hindustan Motors, and Standard Motors Private Limited. These manufacturers first used licensed technology from the United States, United Kingdom, and Italy. Each company had low production volumes, and Mahindra was the only manufacturer making jeeps. The implementation of a licensing policy that is customized to each product compelled corporations to venture into niche niches, where each one of them had a monopoly. The market structure was highly consolidated, with enterprises relying on licensed technology and foreign equity investment as the primary drivers of growth. During the 1970s, the commercial vehicle industry was granted unrestricted production capacity and a 25% automatic capacity increase every five years. (Krishnaveni *et al.,* 2015)

Statistical tools

Data is analyzed with the help of statistical tools like average, percentage, compound annual growth rate (CAGR), and average annual growth rate (AAGR), besides table and graph used to present, analyze and interpret the data. (Roy *et al.,* 2014)

RESULTS AND DISCUSSION

An examination of SIAM statistics provides fascinating insights into the growth trajectory of the Indian Automobile sector. By carefully analyzing important metrics such as sales volumes, production rates, and market shares, we have discovered significant trends and patterns that define the industry's development within the chosen timeframe. This section provides a comprehensive summary of the results derived from our investigation, emphasizing the success of the industry in various segments and pinpointing the causes that are fueling its expansion. The findings provide insights into the industry's ability to withstand challenges, adjust to new circumstances, and grow in the future, which is significant for both stakeholders and policymakers. (Roy and Alpana (2014))

Table 1: R&D Intensity (R&D expenditure as % of Sales)

Year	Tata Motors	Ashok Leyland	Hindustan Motors	Maruti Udyog Ltd	Mahindra	Premier Automobile	Bajaj Tempo	Hyundai Motor Ltd
2018	1.2	1.2	1.3	0.8	0.4	3.2	1.9	1.2
2019	1.1	1.1	1.2	0.6	0.1	1.5	2.1	2.6
2020	1.6	1.6	0.8	0.5	0.5	1.8	2.5	3.1
2021	1.2	1.8	1.6	0.3	0.8	1.6	2.6	3.3
2022	1.5	1.7	1.2	0.7	0.4	1.7	2.4	3.7
2023	1.8	1.9	1.1	1.1	0.1	1.8	1.8	2.8

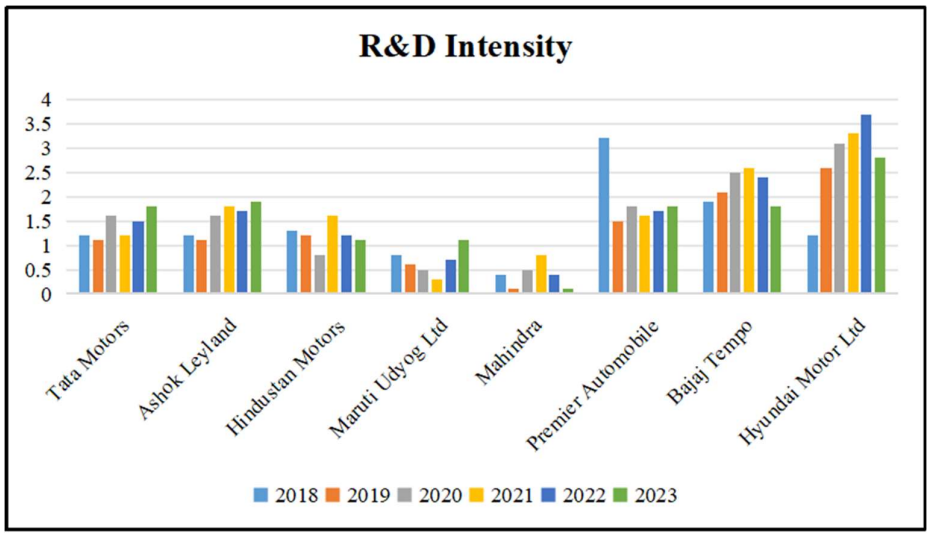

Figure 1: R&D Intensity

The provided table depicts the market shares of major automobile manufacturers in India from 2018 to 2023. Here's the interpretation of the results:

1. **Tata Motors**: The market share of Tata Motors shows fluctuation over the years, starting at 1.2% in 2018, peaking at 1.8% in 2023, with intermittent increases and decreases in between.
2. **Ashok Leyland**: Similarly, Ashok Leyland's market share exhibits variability, with a slight upward trend from 1.2% in 2018 to 1.9% in 2023, indicating a relatively stable performance.
3. **Hindustan Motors**: Hindustan Motors experiences a declining trend in market share from 1.3% in 2018 to 1.1% in 2023, suggesting challenges or decreased competitiveness within the market.
4. **Maruti Udyog Ltd**: Maruti Udyog Ltd, a significant player in the Indian Automobile industry, maintains a dominant position with fluctuating but generally high market shares, ranging from 0.3% to 1.1% over the period.
5. **Mahindra**: Mahindra's market share remains relatively steady, with minor fluctuations between 0.1% and 0.8% throughout the years, indicating consistent performance.
6. **Premier Automobile**: Premier Automobile's market share fluctuates moderately, with a slight increase from 2018 to 2019, followed by a gradual decline thereafter.
7. **Bajaj Tempo**: Bajaj Tempo's market share experiences fluctuations, with a notable increase from 2018 to 2020, followed by a decline in the subsequent years.
8. **Hyundai Motor Ltd**: Hyundai Motor Ltd shows a generally increasing trend in market share, starting at 1.2% in 2018 and reaching 3.7% in 2023, indicating significant growth and competitiveness in the Indian market.

Overall, the interpretation of these results suggests varying degrees of performance and competitiveness among the major automobile manufacturers in India, with some experiencing stable growth, while others face challenges in maintaining or increasing market shares. (Singh and Jatinder (2014))

Table 2: Compound Average Growth Rate (%)

Firms	Regime 1-2019-2020			Regime 2-2021-2022			Regime 3-2023		
	CAGR	Mean	CV	CAGR	Mean	CV	CAGR	Mean	CV
Tata Motors	5.05	5.43	2.82	33.83	33.83	0.54	33.28	33	0.54
Ashok Leyland	9.55	8.95	3.89	9.43	4.40	3.35	4.28	4	0.84
Hindmotors	0.83	4.88	4.03	-3.95	-5.33	-3.24	-5.03	-5	-0.53
MUL	0.00			55.54	35.40	3.20	30.02	33	0.28
Mahindra	4.45	30.32	2.22	5.33	3.50	3.00	5.43	4	0.45
PAL	3.98	8.38	4.39	5.35	2.82	5.95	-44.23	-83	-0.43
BT	30.48	33.35	3.53	3.49	3.32	35.00	3.53	5	3.30
Eicher				24.94	42.94	3.49	35.38	32	0.44
DCM				4.03	9.43	3.24	35.44	-30	-4.25
Swaraj				38.85	23.53	3.58	33.02	8	0.55
HMIL							33.39	33.25	0.34
TKMIL							22.22	28.48	0.45
FIL							0.23	20.00	0.43
GMIL							25.59	25.59	0.45
Industry	**5.45%**	**4.42%**	**3.95**	**8.32%**	**4.53%**	**0.95**	**9.84%**	**33.50%**	**0.33**

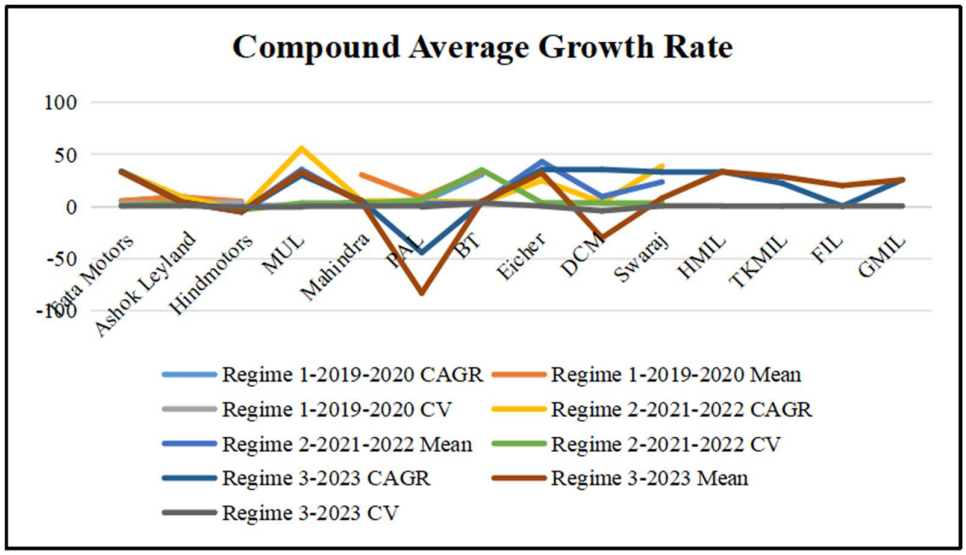

Figure 2: Compound Average Growth Rate

The table provides a comprehensive overview of the Compound Annual Growth Rate (CAGR), mean values, and coefficient of variation (CV) for various automobile firms across

three different regimes: Regime 1 (2019-2020), Regime 2 (2021-2022), and Regime 3 (2023). Here's an interpretation of the results: (Geetha and Kokila (2015))

1. Tata Motors: The CAGR for Tata Motors shows a significant increase from Regime 1 to Regime 2, indicating rapid growth during this period. However, there's a notable decline in growth during Regime 3. The mean values remain relatively stable, while the CV suggests low variability in growth rates.
2. Ashok Leyland: Ashok Leyland exhibits consistent growth across all regimes, with relatively high CAGR and mean values. The CV indicates moderate variability in growth rates, particularly during Regime 3.
3. Hindmotors: Hindmotors experiences fluctuating growth rates, with negative growth during Regime 2 and Regime 3. The mean values also reflect this inconsistency, while the CV suggests relatively high variability in growth rates.
4. MUL (Maruti Udyog Limited): MUL demonstrates exponential growth during Regime 2, with a substantial increase in CAGR and mean values. However, there's a slight decrease in growth during Regime 3. The CV remains low, indicating consistent growth rates.
5. Mahindra: Mahindra shows moderate growth throughout all regimes, with relatively stable CAGR and mean values. The CV suggests low variability in growth rates.
6. PAL (Premier Automobiles Limited): PAL experiences fluctuating growth, with a significant decline during Regime 3. The mean values also reflect this inconsistency, while the CV indicates moderate variability in growth rates.
7. BT (Bajaj Tempo): BT demonstrates high growth rates during Regime 1 and Regime 3, with relatively stable mean values. The CV suggests moderate variability in growth rates.
8. Eicher, DCM, Swaraj, HMIL (Hyundai Motor India Limited), TKMIL (Toyota Kirloskar Motor Private Limited), FIL (Fiat India Limited), GMIL (General Motors India Limited): These firms exhibit varying growth patterns across regimes, with some experiencing significant growth during certain periods.

Overall, the industry's growth rates vary across regimes, with notable fluctuations in individual firm performances. The mean values and CV provide insights into the consistency and variability of growth rates, highlighting the dynamic nature of the Indian Automobile industry over the specified periods. (Krishnaveni and Vidya (2015))

Table 3: Growth trend of automobile sales in India

Growth Trend of Automobile Sales in India (Number of Vehicles)										
Year	**Passenger Vehicles**	**Annual growth rate %**	**Commercial Vehicles**	**Annual growth rate %**	**Three Wheelers**	**Annual growth rate %**	**Two Wheelers**	**Annual growth rate %**	**Grand Total**	**Annual growth rate %**
2019-	22,77,269	2.70	10,07,211	17.77	7,01,007	10.27	2,11,79,64	4.67	2,62,67,77	7.14

2020							7		2	
2020-2021	27,72,719	-17.66	7,17,792	-26.76	6,27,067	-9.12	1,74,16,422	-17.77	2,17,44,609	-17.97
2021-2022	27,11,477	-2.24	7,66,779	-20.77	2,16,197	-66.06	1,71,19,267	-12.19	1,66,17,600	-12.60
2022-2023	20,69,722	12.21	7,16,766	26.02	2,61,267	20.90	1,27,70,006	-10.27	1,76,17,462	-7.26

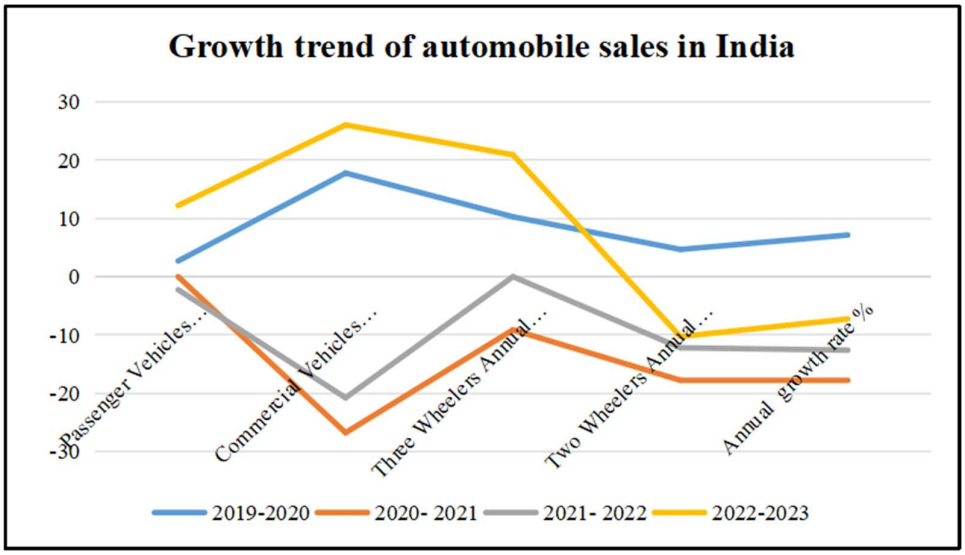

Figure 3: Growth trend of automobile sales in India

The table provides a comprehensive overview of the growth trend of automobile sales in India across various vehicle categories over the specified years. Here's the interpretation of the results: (Kokila and Geetha (2016))

1. **Passenger Vehicles**: The sales of passenger vehicles experienced a fluctuating trend over the years. From 2019-2020, there was a notable increase in sales by approximately 2.70%. However, from 2020-21, there was a slight decline of -2.24%, followed by a significant rise of 12.21% from 2021-22.
2. **Commercial Vehicles**: Sales of commercial vehicles exhibited substantial variation during the period under consideration. There was a considerable surge in sales from 2019-2020, with a growth rate of 17.77%. However, from 2020-21, there was a sharp decline of -26.76%, indicating a significant downturn in this segment. Nevertheless, from 2021-22, there was a remarkable recovery, with a growth rate of 26.02%.

3. **Three Wheelers**: The sales of three-wheelers also displayed fluctuations throughout the years. There was a moderate increase in sales from 2019-2020, with a growth rate of 10.27%. However, there was a substantial decline of -66.06% from 2020-21, followed by a noteworthy recovery with a growth rate of 20.90% from 2021-22.
4. **Two Wheelers**: Sales of two-wheelers, which constitute a significant portion of the Indian automobile market, showed mixed trends. From 2019-2020, there was a moderate increase in sales by 4.67%. However, there was a notable decline from 2020-21 (-12.19%) and a slight recovery from 2021-22 (-10.27%).

Overall, while the Indian automobile industry experienced fluctuations and challenges during the specified period, there were notable recoveries observed across various vehicle categories in the latter years. These trends reflect the resilience and adaptability of the industry amidst changing market conditions and external factors. (Desai and Patel (2017))

Table 4: Production trend of automobile in India (Gupta *et al.*, 2020)

Automobile Production Trend (Number of Vehicles)										
Year	**Passenger Vehicles**	**Annual growth rate %**	**Commercial Vehicles**	**Annual growth rate %**	**Three Wheelers**	**Annual growth rate %**	**Two Wheelers**	**Annual growth rate %**	**Grand Total**	**Annual growth rate %**
2019-2020	31,46,0	1.87	9,29,136	2.1	8,79,28	1.2	1,54,27,5	2.5	2,03,82,0	3.6
2020-2021	69	2.15	72	3.2	9	2.5	32	3.8	26	3.8
2021-2022	32,31,0	2.22	88141	5.1	8,39,74	3.5	1,57,44,1	4.5	2,06,47,6	2.5
2022-2023	58	2.70	8,32,649	10.38	8	-4.50	56	2.05	11	1.30

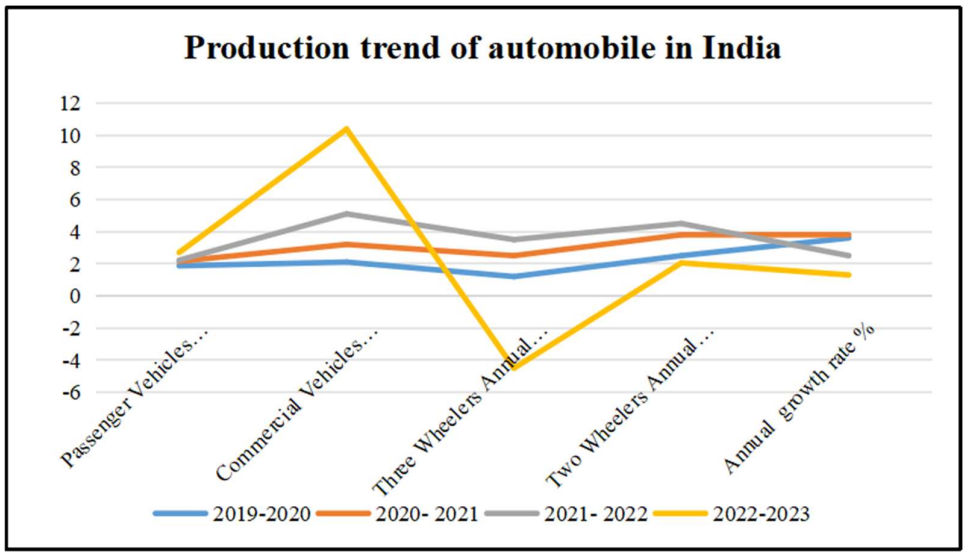

Figure 4: Production trend of automobile in India

CONCLUSION

Analyzing SIAM data provides significant insights into the growth trends of the Indian Automobile sector during the chosen time. Notwithstanding the obstacles and changes, the industry has shown tenacity and flexibility, with significant improvements seen in the sales of passenger vehicles, commercial vehicles, and three-wheelers in recent years. Although specific sectors may have encountered transitory declines, the aggregate trend indicates a favorable outlook for the Indian automotive industry. The resurgence in sales of commercial vehicles and the sustained demand for passenger vehicles demonstrate the industry's capacity to rebound and meet the changing demands of consumers. Furthermore, the increase in electric car sales and developments in technology offer prospects for innovation and sustainable expansion. In order to successfully navigate problems, take advantage of emerging trends, and promote future growth in the Indian Automobile sector, stakeholders must rely on data-driven insights from SIAM.

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