



**AN EXAMINATION OF THE GROWTH PERFORMANCE OF THE INDIAN
AUTOMOBILE INDUSTRY**

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ABSTRACT

The automotive sector holds significant importance in driving economic development in India. The Indian automotive sector has experienced significant development over the last twenty years, garnering international attention and positioning itself as a strong contender for a top-tier position. In the last decade, India has gained significant prominence as a global hub for the production of premium automotive components and vehicles across various categories, thereby closing the distance it previously held with a number of well-established locations. The effects of the closure in India, with a specific focus on the enormous damage it inflicts on the automobile industry.

INTRODUCTION

Unhygienic practices include the use of animals or carts (donkeys, horses, camels, bulls, etc.) to transport people from one location to another, in addition to transporting products. However, in the present day, individuals rely on automobile industries, specifically two-wheelers and three-wheelers, to transport products and travel between locations. The automotive sector holds significant importance in India's economic expansion and, fortunately, is one of the fortunate industries that participates in global value chains (GVCs).

Prior to 1478, the automobile was unimaginable. No one can conceive of the automobile industry without a machine in the twenty-first century. The history of the automobile is conveyed through its evolution and introduction to the globe. Asia ranks as the seventh largest market in terms of Indian passenger vehicles and the tenth largest market globally.

In the past eighty years, there was no vehicle manufacturing in India, which resulted in the absence of a market for automobiles in India. Since the country's independence, the government has been working to increase the development of the vehicle sector. Even though the vehicle sector in India is still in its infancy,

progress is gradual in this country. On the other hand, the circumstance has evolved since then. There is a wide range of transportation options accessible, such as automobiles, motorbikes, and sport utility vehicles (SUVs). The names BAJAJ, HERO MOTOCORP, MARUTI SUZUKI, MAHINDRA & MAHINDRA, HYUNDAI, TATA MOTORS, TVS, and CHEVROLET are among the most well-known names in the vehicle manufacturing industry.

Based on data released by the Ministry of Commerce's Department of Industrial Policy and Promotion (DIPP), the auto sector received a total of \$7,518 million in cumulative foreign direct investment (FDI) from April 2000 to November 2001. The automotive industry contributes 4% of the overall foreign direct investment (in US dollars) inflows to India. Sincere Neelofar Kamal (2014) to 2017

The Society of Indian Automobile Manufacturers (SIAM) has recently disclosed data indicating that the scooter and motorcycle manufacturing sector in India experienced a growth rate of 4 percent from April to November 2012. The manufacturer with operations in India and around the world is concentrating on the creation of novel products, technologies, and supply chains. India is a

significant market for global manufacturers of electric and hybrid vehicles, which represent a recent development in the automotive industry. Operating at a revenue of nearly \$59 million US dollars, the automobile industry in India employs thirteen million members of the working class. (Kamal Neelofar, 2014-2017)

When it came to the car market in India, two-wheelers and passenger vehicles held market shares of 18% and 77%, respectively, during the fiscal year 2021-22. When it comes to passenger vehicle sales, compact and midsize automobiles are the most popular choices. There was a good development of 35.9% in the export of autos, which increased from 4,134,047 in 2020-21 to 5,617,246 in 2020-21. This was judged to be a beneficial development.

India has the goal of doubling the size of its automobile industry by the end of the year 2024, which will bring the total number of automobiles produced to 15 lakh. Foreign direct investment (FDI) totaling \$33.7 billion was received by the industry between April 2000 and September 2022. This figure represents roughly 5.48% of the total FDI inflows that occurred in India over the same time period.

Over the course of the past twenty years, the automotive industry in India has undergone substantial expansion, which has resulted in the sector gaining international attention and placing itself as a formidable challenger for top-tier positions. In the past ten years, India has made great progress towards becoming a worldwide hub for the manufacturing of premium automotive components and automobiles across a wide range of categories. As a result, it has been able to close the gap that it had previously held with a number of well-established locales.

India is the second largest manufacturer of two-wheelers and the fifth largest manufacturer of commercial vehicles. It is also one of the markets for passenger automobiles that is increasing at the fastest rate in the world. In addition to that, the most successful motorbike manufacturer is located there. Additionally, India is ranked fourth, and its automobile industry has experienced a growth rate of 26% over the course of the last two years (both 2010 and 2012). In spite of this, its growth in 2012 was insignificant, coming in at only 12 percent. It is not expected that the 10 percent growth that was anticipated for the exhausted in 2013 will continue. The most significant factors are the high costs of ownership (including taxes on fuel, registration, excise, and road fees) and the

slow increase of income in rural areas. It is projected that the increase will be modest but consistent over the next few years. Foreign Direct Investment (FDI) is something that the government of India actively promotes in the automobile industry through the use of an automated method.

IMPACT OF COVID-19 ON AUTOMOBILE INDUSTRY:

The effects of the closure in India, with a specific focus on the enormous damage it inflicts on the automobile industry. Diverse researchers estimate that the Indian economy will experience a 10–31% decline in Gross Domestic Product and a daily production loss of Rs. 2300Cr in the automobile sector during the closure period.

The pandemic of COVID-19 has devastated the global economy and society. A nationwide quarantine has been implemented by the governments of the affected countries in an effort to contain the epidemic. While the implementation of the closure may have effectively impeded the transmission of the disease, it has inflicted severe economic repercussions by upsetting entire value chains in the nation's most critical enterprises. Numerous industries, including the automotive sector, are being profoundly

affected by the epidemic. Prominent manufacturers are either ceasing operations entirely in accordance with directives from local governments or reducing workforce at their manufacturing sites to ensure employee safety. In addition to structural modification openings with the goods and services tax, axle-load reforms, and the transition to shared mobility, among other factors, the automobile industry has been essentially at a standstill since March 24 as a result of the COVID-19 lockdown. The extended reduction in customer demand due to the lockout is a significant source of concern for the automotive industry. A significant number of companies are reducing their investments in research and development (R&D) in order to maintain critical operations and potentially recover losses incurred from the expansion of alternative fuels and mobility technologies.

AREA UNDER AUTOMOBILE INDUSTRY AND THE COVID-19 IMPACT ON AUTODEALERS:

Automobile dealers have encountered numerous obstacles. There are at least 15,000 two-wheeled, three-wheeled, and four-wheeled vehicle dealerships in India. Car transfers were not possible throughout the lockout period. Automobile dealers informed clients prior to the closure that

completed products would be offered at a substantial discount for a period of 30-45 days. It is anticipated that between 8 and 10 percent of this dealership will close within the next six months.

AUTOSUPPLIERS:

As a result of their reliance on immigrant labour, auto suppliers are apprehensive that the shutdown's additional delay will ripple throughout the entire assessment chain. The liquidity concerns of suppliers could potentially be further intensified by the decline in market conditions, thereby engendering far-reaching disruptions throughout the entirety of the production chain.

FINANCE COMPANIES:

New loans are anticipated to decrease as loan evasion increases, owing to the challenge of establishing a customer's creditworthiness. Mobility solution providers, used car dealers, and automotive service providers are anticipated to experience financial strain as a result of the COVID-19 pandemic.

SALES:

Automobile sales for new vehicles were significantly impacted by the COVID-19 pandemic in February 2020. For instance, new car sales in China decreased by an

astounding 92% in February alone. Automobile sales in Europe decreased by 7.4% compared to prior years. A multitude of sectors within the Indian economy, including TVS and Mahindra, have been adversely affected by the blockade.

ISSUES FACED BY AUTOMOTIVE SECTOR DUE TO COVID-19

The automotive sector is currently facing a precarious state of affairs due to the disruption of regular operations brought about by the epidemic and the resulting financial uncertainty. A number of substantial supply chain sectors are situated within the affected areas.

The regions encompass. Emergencies including power disruptions, cyber incidents, and natural disasters, among others, require specialised emergency plans that facilitate operational effectiveness. Prolonged repercussions have accelerated the mobbing procedure.

RISK RESPONSE AND MANAGEMENT:

It is vital to prepare for tense situations in advance. In order to effectively address the pandemic, which has shifted its epicentre from Asia to North America and Europe, automotive companies must remain current. Businesses ought to not only contemplate the impact of the

epidemic on various critical domains, but also the swiftly growing economic, strategic, and financial market environment and financial markets.

WORKFORCE:

Bureau of Labour statistics indicate that automakers and their suppliers have provided employment to over one million Americans. It is imperative for a business leader to prioritise the welfare of their personnel. Potential repercussions on production capacity include a substantial number of employees falling unwell due to the spread of the pandemic. Workers must be duly informed in a manner that is precise, succinct, and appropriate, particularly in light of the growing number of intricate instances resulting from enhanced testing accessibility.

SUPPLYCHAINANDOPERATIONS:

COVID-19 could potentially impact the automated supply chain in a significant way. Vehicle production has experienced a significant decline in countries such as Japan, China, and South Korea due to the outbreak of this virus. Epidemic-induced disruptions caused by manufacturers with global supply networks are anticipated to have the greatest impact on two- and three-tier dealers. A number of methods are under consideration to improve chain

visibility and communication channels in order to facilitate the early detection of potential problems and the formulation of repair strategies.

LIQUIDITYANDFINANCE:

Early in the first quarter, the COVID-19 outbreak disseminated at an accelerated rate. The aforementioned issues have caused operational complications, which have caused businesses in Spain, Italy, and France to experience delays in completing their financial statements. Further compounding the situation, a limited number of automakers are growing increasingly apprehensive that the financial repercussions of the pandemic could prompt reform events and recoverability of receivables measures. Over the coming weeks, the financing team may experience a substantial surge in the volume of work they are capable of procuring. The majority of suppliers and multinational corporations should thoroughly examine their policies regarding money and liquidity in consideration of the impact of this epidemic on global credit markets and the world at large.

STRATEGY:

Short-term declines in consumer demand due to economic uncertainty and the

COVID-19 outbreak may result in postponed sales of new vehicles and payments for additional maintenance. Potential compromise of employee relaxation and support responsibilities could result from a disruption in the vehicle supply chain. In order to mitigate the impact of persistently declining intent currency in the market due to its inactivity, a novel approach could be developed.

VARIOUS CHALLENGES OF AUTOMOBILE INDUSTRY:

Furthermore, several challenges (Accenture, 2020) that must be surmounted prior to implementing the aforementioned solutions are detailed in the table below.

IMPACT ON TRADE:

Reverse employee migration is one such concern. A decline in industrial production due to a shortage of skilled labourers could have repercussions for labor-intensive companies, as many migrant workers with specialised abilities who were inactive during the crisis are now returning to their countries of origin, where they may not return immediately. Critically coronavirus-affected nations—namely, the European Union, China, and the United States—contribute one-third of

India's imports and two-fifths of its exports. China and the United States accounted for one-third of India's imports and exports, respectively. India's imports and exports to the European Union, the United States, and China represent one-third and two-fifth, respectively, of the country's total exposure. As a consequence, the likelihood of an increase in exports diminishes as the rupee depreciates, given that these countries may enter a recession and experience a significant decline in aggregate demand. Additionally, India's exposure to imports is greater than its exposure to exports to the rest of Asia, especially ASEAN; consequently, the anticipated profit is diminished due to currency depreciation.

In recent years, nations throughout the globe have been grappling with economic recession. In a globalised economy, nations are interdependent and interconnected to the extent that a recession in one economy affects the performance of another. Nations engaged in discussions regarding strategies to rejuvenate their economies and enact foundational reforms. The COVID-19 pandemic, which originated in China and came as an unexpected surprise, has worsened the situation in more than two hundred countries. Numerous nations were compelled to implement economic

closures and declare states of emergency as a precautionary measure to safeguard the lives of their citizens.

The February pandemic surge that struck India hampered the operations of government officials, regulatory agencies, and administrators. When compared to the economies of other nations worldwide, India's economy is quite diverse. Its population is estimated to be 130 billion, with a substantial concentration of inhabitants residing in remote and rural areas. It lacked adequate medical facilities, respiratory and life support systems, masks, and personal protective equipment in the early stages of the pandemic. Lockdown has been declared by the government to protect the welfare of the populace at the expense of the economy. The economy was halted for over 45 days as a result of these actions, from March 25, 2020 to May 13, 2020; the process of resuming operations did not commence until June 1, 2020.

Significant effects have resulted from the decision to close down the Indian economy and several industries. Two consecutive quarters of negative GDP reports by India have also prompted a closure. The impact was readily observable in the market capitalization of prominent sectors. (Ramarcha Kumar and

Himanshu Bharti, 2022)

RECENT MEASURES AND GOVERNMENT APPROVED SCHEMES FOR AUTO MOBILE AND AUTO COMPONENT INDUSTRY IN INDIA:

FOREIGN DIRECT INVESTMENT:

Direct investment is when a resident entity from one nation (direct investors) buys a long-term stake in a foreign firm (direct investment enterprise) (IMF, 2003). IMF and OECD definitions form the basis of this concept. The term "lasting interest" refers to the existence of a long-term partnership between the direct investor and the direct investment enterprise. In this partnership, the investor has a significant amount of control over the administration of the firm. This encompasses all subsequent capital transactions that take place between the investors and the firm, as well as those that take place between related, incorporated, and unincorporated enterprises, as well as the initial transaction that establishes the relationship between the investors and the enterprise. Multinational companies (MNCs) would only select foreign direct investment (FDI) over export provided certain minimum levels of economic growth and market institutional prerequisites were there. It is possible that these may refer to the

development of infrastructure, the protection of intellectual property rights, or the provision of workforce that is qualified (Patibandala, 2001).

BHARATSTAGE(BS)EMISSIONSTANDARD:

In order to regulate the emission of air pollutants from machinery that is powered by compression ignition engines and spark-ignition engines, such as motor vehicles, the government of India set emission standards that are known as Bharat Stage Emission Standards (BSES). These standards were designed with the intention of regulating the emission of automobiles. Since 2000, when the standards founded on European regulations were initially implemented. Since then, increasingly stringent regulations have been implemented. After the standards are implemented, all newly manufactured vehicles must comply with the regulations. Nationwide Bharat stage (BS) III standards have been in effect since October 2010. Stage IV emission standards for India have been implemented since April 2010 in thirteen main cities and nationwide since April 2017. The Indian government declared in 2016 that the nation would completely forego the BS V standards and transition to the BS VI standards by the year 2020.

The Supreme Court, in a recent ruling, has prohibited the registration and sale of motor vehicles meeting the Bharat stage IV emission standard throughout the entire nation as of 1 April 2020.

The Petroleum Ministry of India made the decision on November 15, 2017, to move the date of the introduction of BS VI grade automobile fuels in the National Capital Territory of Delhi from April 1, 2020 to April 1, 2018. This decision was made after consulting with public oil marketing corporations. The first of April, 2018, will mark the beginning of this transformation. To be more specific, on April 1, 2019, the Ministry of Petroleum made a request to the Oil and Gas Companies (OMCs) to study the potential of deploying BS VI vehicle fuels over the entire National Capital Region (NCR). This monumental action was taken in response to Delhi's severe air pollution problem, which worsened in 2019. Automobile manufacturers reacted angrily to the decision, as their development had been meticulously planned in accordance with a road map for 2020.

Regulations pertaining to vehicular emissions have prompted the discontinuation of two-stroke engines for two-wheelers, the introduction of electronic controls, and the transitioning

out of two-stroke engines.

Although adherence to these standards does contribute to the reduction of pollution levels, it inevitably raises the cost of vehicles as a result of additional petroleum and technological advancements. Respiratory and cardiovascular diseases are among the conditions that can be induced by air pollution. In 2010, these conditions were responsible for an estimated 6,20,000 premature fatalities.

PRODUCTION LINKED INCENTIVE (PLI) SCHEME:

A proposed investment of Rs.74,850 crore in the automotive and auto component industry in India has been effectively drawn as a result of the production linked incentive (PLI) programme, which has the goal of attracting investments totaling Rs. 42,500 crore over a period of five years. In accordance with the champion OEM Incentive scheme, approved applicants have contributed a total of Rs 45,016 crore to the proposed investment, while the component incentive scheme has received a cumulative contribution of Rs 29,834 crore.

A total of 115 companies submitted applications for the scheme. There were five original equipment manufacturers

(OEMs) that have submitted applications for both of the schemes' components. The deadline for submission of applications for the initiatives been extended until January 9, 2022 at 23:59:59 hours Indian Standard Time (IST).

The purpose of this scheme is to enhance the manufacturing capacity of the country for advanced automotive products (AAT). As part of the PLI initiative for the Automobile and Auto Component Industry, financial incentives are being presented with the goal of boosting local production of Advanced automobile Technology (AAT) goods and encouraging investments in the value chain of the automobile manufacturing industry. This initiative's key objectives are to overcome cost restrictions, achieve economies of scale, and construct a reliable supply chain that is tailored particularly for AAT goods. Moreover, employment opportunities will be created. Through the implementation of this project, the automobile industry will be able to advance along the value chain in the direction of products that have a higher added value.

The two components that make up the programme are the Champion OEM incentive system and the Component champion incentive scheme. Through the

use of this PLI initiative, approval has been granted to a total of 95 applicants. Prior to this, MHI had granted authorization for twenty applications to participate in champion OEM incentive programmes. These applicants were accompanied by twelve subsidiaries. As a consequence of this, MHI processed the component champion incentive plan applications that were received, and it granted approval to 75 applicants (together with their 56 subsidiaries) for this category of the schemes. Pib.gov.in states that two original equipment manufacturers (OEMs) of automobiles have been given permission to participate in both aspects of the schemes.

The automotive sector is often regarded as an economic barometer in India. The automotive sector has contributed 7 percent to India's GDP (nearly 49 percent to manufacturing) and employs 29 million individuals (directly and indirectly).

TATA MOTORS was initially introduced in India during the 1980s. The automobile industry in India experienced a substantial compound growth rate of 22% between 1992 and 1997, according to the Ministry of Commerce and Industry. The automotive sector is expected to employ 35 million individuals in direct and indirect employment by 2016. The

automotive sector in India is a highly lucrative industry and the largest sales market globally. During the period of 2017 to 2018, the automotive industry deliberated on their sales. The growth rate from March 31, 2018 to April 1, 2017 was in the double digits. The market for passenger vehicles will rank third largest globally in 2021. It is unquestionably 7% annually in the GDP (Gross Domestic Product).

It is anticipated that the market for automobiles in India will reach USD 160 billion by the year 2027, which is an increase from USD 100 billion in 2021. Taking into account both the volume of sales and the amount of production, the automobile industry in India is among the most significant contributors to the economy of the country. Manufacturing is the key sector of the Indian economy that contributes to the generation of money and employment opportunities. Sectors that have a significant upward and downward interaction with the economy are those that fall under the category of industry. It is also noteworthy because the sunrise sector has had especially rapid economic expansion. Due to the aforementioned circumstances, the current study endeavoured to conduct an analysis of the growth performance of the automobile sector in India with the following aims.

OBJECTIVES:

To analyze the recent trends in passenger vehicles production, sales and exports

In India

To examine the performance of automobiles from 2011-2021 in India

METHODOLOGY

The Methodology of the present study entitled “A study on Growth Performance of Automobile Industry in India” is discussed as follows.

I. PROFILE OF THE STUDY AREA:

India is an ancient civilization with a diverse culture and a rich heritage. Since gaining independence, India has made significant progress in various aspects of society and the economy. It has achieved self-sufficiency in agriculture and has emerged as one of the leading industrialised nations in the world. Furthermore, India has been able to successfully enter into space exploration with the purpose of improving the lives of its whole population. India is a country that covers a total area of 32,872,633 square kilometres, ranging from the snow-capped Himalayan mountains to the verdant jungles in the southern state of the country. India, which is the seventh largest country in the world, stands apart from the rest of Asia due to the distinctive

geographical features that it possesses, such as its mountains and beaches. It runs southwards till it reaches the Tropic of Cancer, where it joins the Indian Ocean, with the Bay of Bengal to the east and the Arabian Sea to the west. It is bounded by the beautiful Himalayas in the north, and when it reaches the Tropic of Cancer, it meets the Indian Ocean.

COLLECTION OF DATA:

The study relies on secondary data. The data for this study was obtained from the Society of Indian Automobile Manufacturers for the time span of 2011 to 2021.

II. TECHNIQUES OF ANALYSIS:

Trend analysis

The purpose of trend analysis is to extract significant insights that may be used to design future business plans. This is accomplished by conducting a systematic evaluation of statistical data and recorded market behaviour over a certain period of time. The key characteristics of the market and the consumers who are associated with it can be better understood with its assistance.

Descriptive statistics:

Descriptive statistics are brief numerical

measures that summarise a data set, which may represent the full population or a sample. Descriptive statistics include measures of central tendency, which indicate a dataset's average value, and variability, which indicate how far data points deviate from the average. Both are descriptive statistics. The mean, median, and mode measure central tendency, whereas the standard deviation, variance, minimum and maximum variables, kurtosis, and skewness reflect variability. Variability measures are less precise than central tendency measures.

Central tendency measures like the mean, median, and mode are the most used descriptive statistics. These measurements are used in many mathematical and statistical situations worldwide. The distribution mean or average is calculated by adding up all the values in the dataset and dividing by the total number of values.

Correlation Matrix

A tabular arrangement that displays the correlation coefficients between various

variables is referred to as a correlation matrix. Every conceivable combination of values in a table is depicted by the matrix, which demonstrates the relationship between those values. Condensing a massive dataset, identifying patterns within the data that is provided, and presenting those patterns are all accomplished with the help of this useful tool.

RESULTS AND DISCUSSIONS

The major findings of the study are presented and discussed as follows:

TREND ANALYSIS

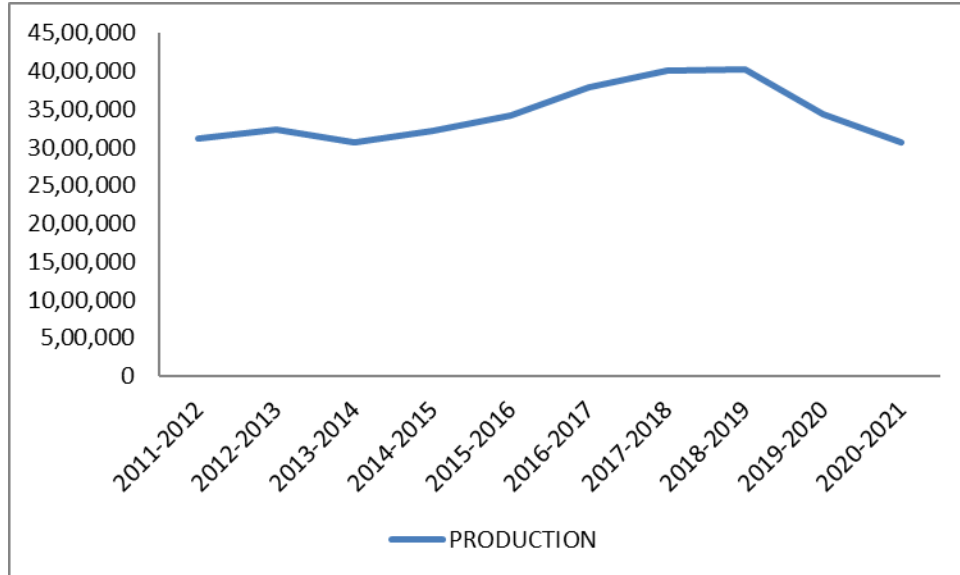
PASSENGER VEHICLES:

PASSENGER VEHICLES- PRODUCTION

The automotive business is comprised of a wide variety of corporations and groups that are involved in the idea, the creation, the production, the promotion, the distribution, the maintenance, and the modification of motor vehicles. The production of passenger autos is summarised in Figure 1, which covers the years 2011 through 2021

FIGURE-1

PASSENGERVEHICLES-PRODUCTION



SOURCE: Estimation based on secondary data (2011-2021)

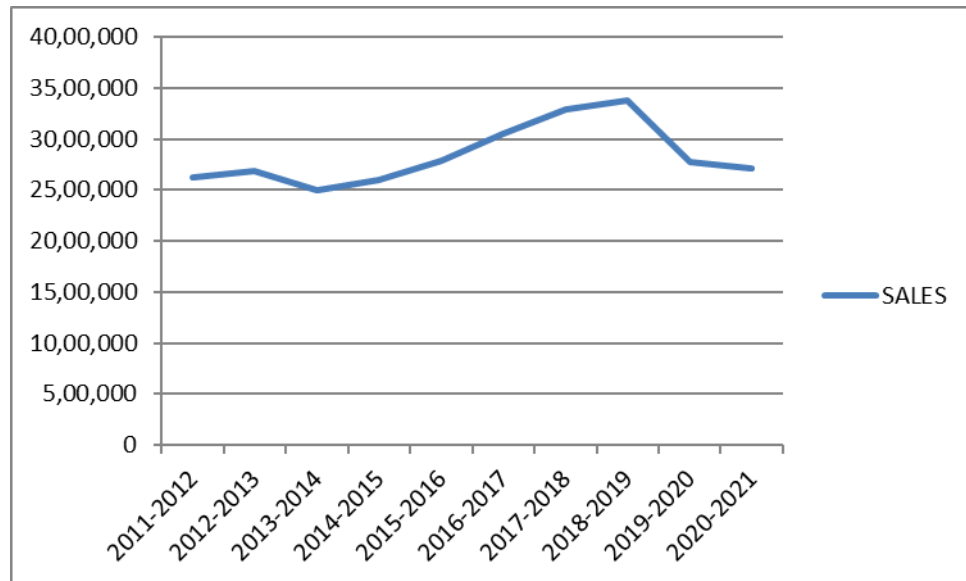
The production of automobiles had an upward trajectory from 2011 to 2012, followed by another increase in production from 2013 to 2014. However, there was a decline in production during 2013 due to the implementation of excise duty declared by the government in the interim budget. From 2014 to 2018, there was a consistent upward trend in production, which continued until 2018-2019. The output pattern for the years 2019-2021 has declined as a result of the pandemic.

SALES:

Figure 2 represents sales of passenger vehicles for the period of 2011-2021

FIGURE - 2

PASSENGER VEHICLES-SALES



SOURCE: Estimation based on secondary data (2011-2021)

The sales of passenger automobiles exhibited an upward trend in 2011-2012, but experienced a downward trend in 2013-2014. The sales of passenger vehicles experienced an increase from 2014-2015 to 2019-2020. However, in 2020-2021, there was a significant fall of 22.4 percent in sales due to the impact of the COVID-19 pandemic, which has negatively affected the sector.

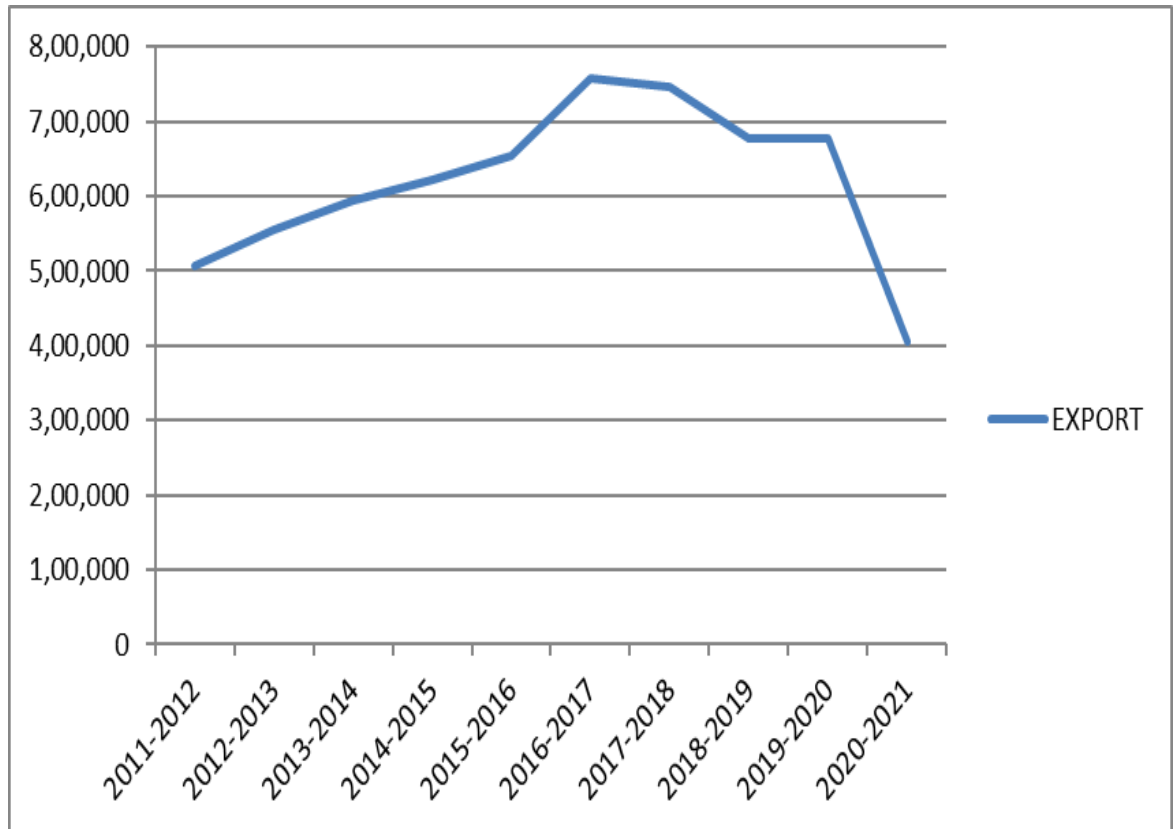
EXPORT:

The act of creating products and services

in one country and then selling them to buyers in another country is what is supposed to be referred to as export. Trade on a global scale involves the transfer of commodities and services between countries through the process of exporting and importing. Exports are essential for market democracies since they enable individuals and businesses to gain entry to a broader market for their goods and services. Figure 3 depicts the exportation of passenger automobiles from 2011 to 2021.

FIGURE – 3

PASSENGERVEHICLES-EXPORT



SOURCE: Estimation based on secondary data (2011-2021)

The export of passenger automobiles experienced a steady increase from 2011-2012 to 2016-2017. From 2017-2018 to 2019-2020, there will be a minor decline in exports due to the ongoing impact of GST refund issues and the negative effects on overseas shipments in 2020-2021. Specifically, the export of passenger vehicles is seeing a downward trend as a result of the global coronavirus pandemic.

B. PRODUCTION PERFORMANCE OF AUTOMOBILES:**TABLE- 1****DOMESTIC PRODUCTION OF AUTOMOBILE**

YEAR	PASSENGER VEHICLES	COMMERICAL VEHICLES	THREE WHEELERS	TWO WHEELERS
2011-12	3,123,528	9,11,574	8,77,711	1,54,53,619
2012-13	3,233,561	8,31,744	8,39,742	1,57,21,180
2013-14	3,072,651	6,98,864	8,30,120	1,68,79,891
2014-15	3,220,172	6,97,083	9,49,021	1,84,99,970
2015-16	3,413,859	7,82,814	9,33,950	1,88,29,786
2016-17	3,791,540	8,10,286	7,83,149	1,99,29,485
2017-18	4,010,373	8,94,551	10,21,911	2,31,47,057
2018-19	4,026,047	11,12,176	12,68,723	2,45,03,086
2019-20	34,34,013	7,52,022	11,33,858	2,10,36,294
2020-21	30,62,221	6,24,939	6,11,171	1,83,49,941

SOURCE: Estimated based on secondary data (2011-2021)

TABLE-1(a)

DESCRPTIVESTATISTICS

	PASSENGER VEHICLES	COMMERICAL VEHICLES	THREE WHEELERS	TWO WHEELERS
MEAN	3438796.5	811605.3	924935.6	19235031
STANDARDERROR	118407.0065	43801.72	58588.37	945539.2
STANDARDEVIATION	374435.8314	138513.2	185272.7	2990058
SAMPLEVARIATION	1.40202E+11	1.92E+10	3.43E+10	8.94E+12
KURTOSIS	-1.084166162	1.512957	0.513331	-0.50625
SKEWNESS	0.741347842	0.996007	0.335491	0.522528
COUNT	10	10	10	10

Source:Estimation basedon secondarydata(2011-2021)

The data in the table indicates that the average annual output of Two wheelers is the highest, followed by passenger vehicles, commercial vehicles, and Three wheelers. In terms of data consistency, domestic production shows that commercial vehicles have the highest level of consistency, with the lowest sample variance of 1.92E+10. Passenger vehicles, three wheelers, and two wheelers follow in descending order.

TABLE- 2**DOMESTICSALESOFAUTOMOBILE**

YEAR	PASSENGER VEHICLES	COMMERICAL VEHICLES	THREE WHEELERS	TWO WHEELERS
2011-12	2,618,072	8,09,532	5,13,251	1,34,35,769
2012-13	2,686,429	7,93,150	5,38,291	1,37,97,748
2013-14	2,503,685	6,32,738	4,79,634	1,48,05,481
2014-15	2,601,111	6,14,961	5,31,927	1,60,04,581
2015-16	2,789,678	6,85,704	5,38,092	1,64,55,911
2016-17	3,046,727	7,14,232	5,11,658	1,75,89,511
2017-18	3,287,965	8,56,453	6,35,698	2,01,92,672
2018-19	3,377,436	10,07,319	7,01,011	2,11,81,390
2019-20	27,73,575	7,17,688	6,36,569	1,74,17,616
2020-21	27,11,457	5,68,559	2,16,197	1,51,19,387

SOURCE:Estimated based on secondary data(2011-2021)

C. SALES PERFORMANCE OF AUTOMOBILES:**TABLE-2(a)****DESCRIPTIVESTATISTICS**

	PASSENGER VEHICLES	COMMERICAL VEHICLES	THREE WHEELERS	TWO WHEELERS
MEAN	2839613.5	740033.6	530232.8	16600007
STANDARDERROR	94205.7066	41274.44	41303.37	811013.3
STANDARDDEVIATION	297904.6014	130521.2	130612.7	2564649
SAMPLEVARIATION	88747151551	1.7E+10	1.71E+10	6.58E+12
KURTOSIS	-0.317274128	0.601643	3.785859	-0.37523
SKEWNESS	0.977738425	0.795548	-1.48059	0.667901
COUNT	10	10	10	10

SOURCE: Estimation based on secondary data (2011-2021)

Based on the data presented in the table, it can be seen that Two wheelers have the largest average yearly sales, followed by commercial vehicles, passenger vehicles, and Three wheelers. In terms of data consistency, domestic sales show that commercial vehicles have the highest level of consistency, with a sample variance of 1.7E+10. Following commercial vehicles are three wheelers, two wheelers, and passenger vehicles.

CONCLUSION

In summary, the performance of automobile manufacturing and sales exhibits a fluctuating tendency between the years 2011 and 2021. The fluctuations can be attributed to factors such as economic slowdown, the implementation of GST, changes in excise duty as outlined in the Government Interim budget, reduced demand for vehicle replacements, and the impact of COVID-19.

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