THE IMPACT OF THE GOODS AND SERVICES TAX (GST) ON THE INDIAN AUTOMOBILE INDUSTRY

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ABSTRACT
The automotive sector in India is one of the fastest growing manufacturing sectors in the world. It makes a significant contribution to the global supply chain. The development of other branches of the economy is strongly linked to the growth of the automotive industry. Globally, India is considered the biggest competitor producing the engines. (ENTERPRISE STANDARD, 2021). In the speech by Union Minister Nitin Gadkari, it was mentioned that the government is working to make the country the world's automobile manufacturing center in the coming years and to make progress in exports. of electric vehicles in five years. India's future is very bright; This study examines the impact of GST on production, sales, import and export of two-wheel and four-wheel motor vehicles in traditional and electric vehicle segments. The review concludes that, as assumed, there are no significant differences in the sales of the vehicles examined. However, after the establishment of GST, the export of traditional motor and electric vehicles in the category of two-wheelers and four-wheelers has increased sharply.

Keywords: *Automobile Sector, Gross Domestic Product (GDP) Goods and Services Tax (GST), Electric vehicles*

I. INTRODUCTION
One of the most important economic drivers in India is the automobile sector. Their involvement in the global value chain has grown dramatically since the 1991 economic reforms (Miglani and Ray, Global Value Chains and the Missing Links Cases from Indian Industry, 2018). The automotive industry is the fourth largest light vehicle manufacturer and the seventh largest commercial vehicle manufacturer in 2019. By 2026, Indian vehicle sector is expected to rise from Rs. 16.16 crore Rs. 18.18 crore (IBEF, 2020). More than 30 million automobiles are produced in India, including commercial vehicles, passenger vehicles, two-wheelers, three-wheelers and other vehicle types (CMIE, 2020).The automobile sector contributes 7.1 % to GDP and employs over 35 million people to be increased to 12% and employment by 50 million; it accounts for 40% of global RandD and 4.3 % of total exports.(INDIA, 2020) According to the Department of Promotion of Industry and International Trade (DPIIT, 2019) the automobile sector drew Foreign Direct Investment (FDI) worth Rs 142,111.91 Cr from 2000 to 2019, accounting for 5% of overall FDI inflows into India. According to Council on energy, Environment and Water, Centre for Energy Finance (CEEWCEF) (Singh, Jain, and Kanika, Dec 2020). Electric vehicle (EV) transition would spur new growth of new industries, but this global shift comes with a great challenge to look on. It will generate new employment opportunities, cut import oil costs and make the environment pollution free. In recent years, the auto sector has seen a higher number of mergers and acquisitions, which has resulted in a synergetic impact in terms of technology and wider access to foreign sources of capital, boosting production efficiency and innovation. With efforts such as Make in India, the Automotive Mission Plan 2026 and the National Electric Mobility Mission Plan (NEMMP) 2020, the government's drive to make India a hub for automotive manufacturing has gained momentum. Population growth and increased commercial activity required the movement of people. Goods and cargo from one

place to another, leading to better connectivity of infrastructure in cities, suburbs and cities, and increased demand for vehicles. One of the most important decision criteria when buying a vehicle is the tax. In previous tax systems, the complexity of tax legislation and the cascading effect and duties led to higher car prices. Many taxes were merged with the introduction of GST, simplifying the tax structure and paving the way for improving supply chain efficiency across India. Vehicle prices were reduced due to the availability of input tax credits (ITC) and the tax cascade is reduced.

Indian Automobile Industry over the years:

The Indian automotive industry is one of the fastest growing sectors in the world. It produces a wide range of vehicles, including two-wheelers, three-wheelers, tractors, automobiles and other heavy vehicles. India imported cars before gaining independence. The indigenous manufacturing industry of India started after the independence of the country. Previously, import duties protected the automotive industry, which met domestic consumer demand. Before the introduction of new economic policies, there were licenses and quantitative constraints. Due to the low economic growth rate and low per capita income of the population, the automobile market was small. Until the 1970s, Hindustan Motors and Premier Motors dominated the Indian automobile market. There were other companies, but the rate of industrial expansion was slow until the 1980s. (Miglani, The Growth of the Indian Automobile Industry: Analysis of the Roles of Government Policy and Other Enabling Factors, 2019) The new Economic policy of 1991 created opportunities for the auto industry. The government policy of requiring local content has led to an increase in FDI inflow and paved the way for mergers, acquisitions and joint ventures in India. The demand for vehicles has been driven by a growing population, increased mobility and rising per capita income. The demand for vehicles is expected to increase due to government programs such as Make in India, GST and other initiatives. The GST tax reform, in particular, is a game-changer for the Indian economy as it has closed the loopholes of the previous tax system, avoided the tax cascade and created a “one nation, one tax and one market” ecosystem. Eventually, this led to lower car prices, which led to a more favorable climate. Currently, most cars are taxed at a rate of 28%, with tax imposed depending on the engine capacity, size and luxury of the vehicle.

II. LITERATURE REVIEW

GST (Goods and Services Tax) came into effect on July 1, 2017. It was a major tax reform that changed the landscape of indirect taxes in India. Since the adoption of the GST, a lot of research has been done to investigate the influence of the GST on different sectors of the economy, both theoretically and experimentally. (Telang and Roy, 2016) compared how Hyundai competes with Maruti Suzuki in the dynamic Indian vehicle market. Accordingly, government measures such as adjustments to consumption taxes and tariffs and the introduction of GST pose challenges to the dynamics of the automotive industry. Government efforts such as "Make in India" and GST will improve car sales.

(Nayar and Singh, 2017) drew attention to the history of India's indirect taxation system. The pros and challenges of adopting GST on various sectors of the economy were examined as the Indian GST system was compared to that of other nations. In particular, it is predicted that GST will lower automotive pricing, lowering the inroad price of autos by about 8%, resulting in increased sales and chances for expansion in India. More analytical research is needed to determine the impact of GST on different sectors.

(Charumathi, Mahesh and Dr. Ranjith, 2019) empirically examined the effect of GST on TATA engine sales. Commercial, passenger and export car sales increased with the introduction of the GST. High

demand for cars in India, global automakers are threatening to enter the country to take advantage of the high demand. Therefore, measures like the Goods and Services Tax (GST) are extremely beneficial for automakers in terms of increasing sales and growing business.

(Jha and Singh, 2020) discussed the advantages and disadvantages of having a uniform GST law for the Indian automotive industry, comparing the tax rates applicable to automobiles such as two-wheelers, small cars, sedans, three-wheelers and utility vehicles, a has found that under GST most vehicles with engines below 1500cc will become cheaper, while those with engines above 1500cc will become more expensive. GST will increase logistics efficiency by reducing transit times and costs. It has been suggested that policy changes such as the GST may have been announced six months before passage so businesses could be better prepared.

(Roopa and Aruna, 2020) examined the effect of GST on the automotive industry. It has been noted that the tax rate applicable to various categories of cars has decreased from pre-GST to post GST, resulting in lower prices for buyers and certainty about the tax to be paid by car dealers and manufacturers. The GST, he said, will pave the way for the growth of the structure of the automobile industry, as well as the development of the country's GDP and finances.

III. OBJECTIVE

1. To investigate the impact of the GST on automotive production, sales, registrations, and exports including electric vehicles.
2. A comparison of the growth of the vehicle industry and FDI inflows into the sector before and after the implementation of the GST.

IV. METHODOLOGY

The research is purely analytical in nature. Its main objective is to determine the impact of the GST on the automotive industry. It is based on secondary data from databases such as Society of Indian Automobile Manufacturers (SIAM), Society of Manufacturers of Electric Vehicles (SEMV) and various sources are cited including annual automotive reports and trade data from the Ministry of Trade and Industry. 'Industry. To arrive at the conclusions of the study, descriptive statistics such as mean, standard deviation, percentage, year-on-year (YoY) growth, paired test, and correlation were used.

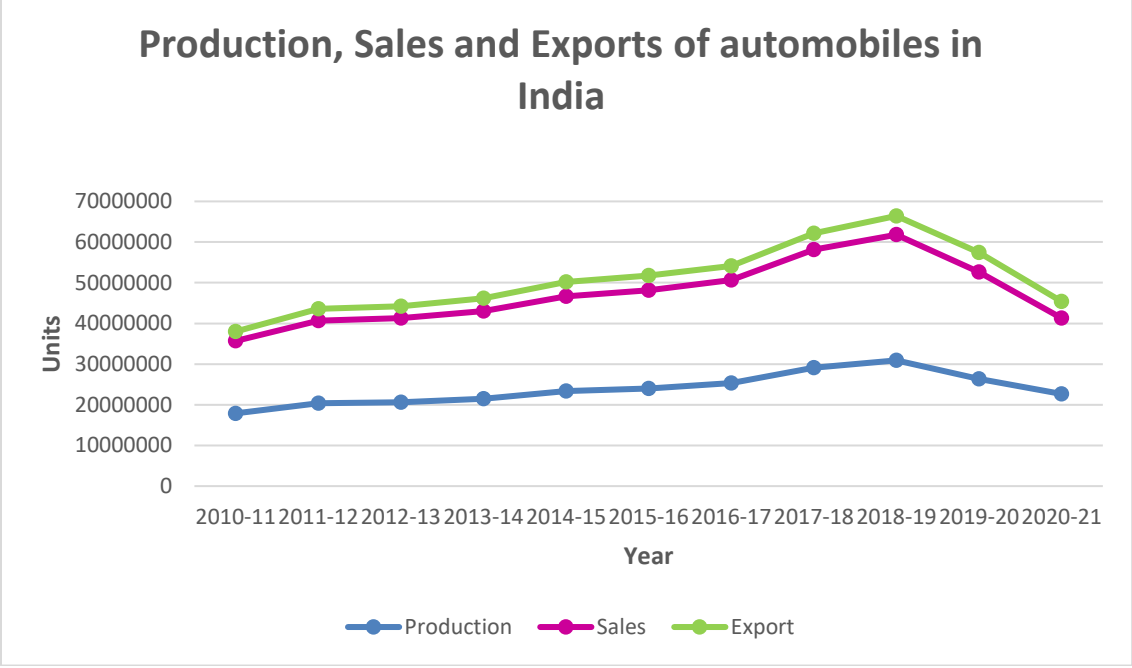
V. DATA ANALYSIS AND INTERPRETATION

Production in 2019				
Countries	**Cars**	**%**	**Commercial Vehicles**	**%**
China	2,13,60,193	41.19	43,60,472	22.34
USA	25,12,780	4.85	83,67,239	42.87
Japan	83,28,756	16.06	13,55,542	6.95
Germany	46,61,328	8.99	-	-
India	36,23,335	6.99	8,92,682	4.57
Mexico	13,82,714	2.67	26,04,080	13.34
South Korea	36,12,587	6.97	3,38,030	1.73
Brazil	24,48,490	4.72	4,96,498	2.54
Spain	22,48,109	4.34	5,74,336	2.94
France	16,75,198	3.23	5,27,262	2.70

Sales in 2019					
Countries	**Cars**	**%**	**Commercial Vehicles**	**%**	**Tax rate (%)**
China	21,444,180	47.59	43,24,497	20.25	1-56
USA	4,715,005	10.46	1,27,64,999	59.79	0-10
Japan	4,301,091	9.54	8,94,125	4.19	10
Germany	3,607,258	8.00	4,09,801	1.92	19
India	2,962,052	6.57	8,54,839	4.00	28+ Cess
Mexico	761,720	1.69	5,97,951	2.80	16
South Korea	1,539,060	3.42	2,56,074	1.20	10
Brazil	2,262,069	5.02	5,25,781	2.46	17
Spain	1,258,260	2.79	2,43,000	1.14	21
France	2,214,279	4.91	4,79,698	2.25	20

Table1. Production, Sales and GST/VAT of automobiles of top 10 manufacturing countries.
Source: OICA Statistics (% is the total of the respective column)

Table 1 gives an overview of cars and commercial vehicle production and sales in 10 manufacturing countries. It also shows the different tax rates that applied to it. It should be noted that the tax rate in China varies between 1 and 56%, depending on the engine and passenger capacity. Car taxes are exempt in some states in the United States, while others charge up to 10%. All other counties have a standard rate, but it is lower than the Indian rate. GST is charged in India at a rate of 28% plus tax. The introduction of GST, along with other government policy efforts and strong consumer demand, led to an increase in automobile manufacture and sales. Due to a lack of demand and an economic slowdown in 2019-20, production and sales fell.



Graph 1: Production, Sales and Export of automobiles in India
Source: Automobile's Production, Sales and Export statistics by SIAM.

The graph shows the production and sales of automobiles in India over time. It can be seen that from 201011 to 201819 production, turnover and export increased. The introduction of GST, along with other

government policy efforts and strong consumer demand, led to an increase in automobile manufacture and sales. Due to the lack of demand and the economic slowdown caused by the Covid epidemic, which led to a state shutdown, production, sales and exports fell from 2019 to 2020.

Before GST			After GST		
Year	**Production**	**Sales**	**Year**	**Production**	**Sales**
2014-15	23358047	23297717	2017-18	29092734	29022548
2015-16	24106068	24112465	2018-19	30909486	30890201
2016-17	25329383	29022548	2019-20	26356187	26306017
Mean	**24264499.33**	**25477576.67**	**Mean**	**28786135.67**	**28739588.67**
S.D.	**995171.7298**	**3096945.252**	**S.D.**	**2292080.899**	**2305154.057**
Paired t-Test values for production			**Paired t-Test values for sales**		
Number of observations = 3 Correlation 'r' = -0.7018 Paired Sample t-test = 2.5482 P value of Paired Sample t-test = 0.1256			Number of observations = 3 Correlation 'r' = -0.8530 Paired Sample t-test = 1.0856 P value of Paired Sample t-test =0.3910		

Table 3. Production and Sale of automobiles (Values in Numbers)

Source: Analysis based on the data of Annual survey of automobile industry by SIAM.

H1: H0: There is no significant difference in production and sale of automobiles before and after GST.

Table 3: illustrates the pre andpost-GST paired t-test results, as well as the correlation andcoefficient of changes in automotive production. There is a substantial degree of negative association between pre andpost-GST automotive manufacturing, i.e., -70%. Similarly, in the sale of autos beforeandafter the implementation of GST in India, there is a high degree of negative correlation, i.e., -85%. It means that there is no link between automotive production and sales before and after the GST. After the adoption of the GST, the mean value of production grew from 24264499 units to 28786135 units, while the mean value of sales climbed from 25477576 units to 28739588 units. However, at a 5% significance level, paired sample t-test results show that there is no statistically significant difference between automotive production and sales. As a result, the null hypothesis is accepted.

Before GST			After GST		
Year	**Exports**	**Imports**	**Year**	**Exports**	**Imports**
2014-15	7856975.35	2708044.34	2017-18	10023811.77	3165315.04
2015-16	8852545.59	2972245.62	2018-19	11122918.45	3767386.55
2016-17	9404045.37	3264217.63	2019-20	12653335.85	4303249.88
Mean	**8704522**	**2981503**	**Mean**	**11266689**	**3745317**
S.D.	**784085.2**	**278202.2**	**S.D.**	**1320644**	**569288.3**
Paired t-Test values for exports			**Paired t-Test values for Imports**		
Number of observations = 3 Correlation 'r' = 0.9667 Paired Sample t-test = 7.429 P value of Paired Sample t-test = 0.01763			Number of observations = 3 Correlation 'r' = 0.9980 Paired Sample t-test = 4.528 P value of Paired Sample t-test =0.0454		

Table 4. Exports and Imports of vehicles (Rs. In Lakhs)

Source: Analysis based on the data of exports and imports vehicles by MOCI.

H2: H0: There is no significant difference in export and import of vehicles before and after GST.
Table 5 displays the paired t-test and correlation coefficient results for vehicle export and import before and after GST adoption. The correlation data showed a 99 % positive connection in exports before and after GST. Similarly, there is a 99 % positive correlation in automobile imports. According to the correlation statistics, there is a strong positive association between exports before and after GST. Exports rose from Rs. 8704522 lakhs to Rs. 11266689 lakhs, while imports rose from Rs. 2981503 lakhs to Rs. 3745317 lakhs. The findings of the paired t-test revealed that there is a statistically significant association between vehicle exports and imports before and after the GST periods, with a significance level of 5%.

Before GST			
Year	**Commercial Vehicle**	**Passenger**	**Two-Wheeler**
2014-15	1403774	6445154	36866054
2015-16	1577656	6884522	37877454
2016-17	1644706	7612618	39860030
Mean	**1542045**	**6980765**	**38201179**
S.D.	**124350.9**	**589652.5**	**1523014**
Paired t-Test values for the sales of Commercial, Passenger and Two-Wheeler Vehicles			

After GST			
Year	**Commercial Vehicle**	**Passenger**	**Two-Wheeler**
2017-18	1907562	8073894	46030240
2018-19	2214488	8107162	48921376
2019-20	1556802	6901772	41875710
Mean	**1892951**	**7694276**	**45609109**
S.D.	**329086.4**	**686530.1**	**3541661**
Commercial Vehicles: Number of observations = 3 Correlation ‘r’ = -0.3064 Paired Sample t-test = 1.5754 P value of Paired Sample t-test = 0.2558			

Passenger Vehicles: Number of observations = 3 Correlation 'r' = -0.9187 Paired Sample t-test = 0.9885 P value of Paired Sample t-test = 0.4270
Two- Wheeler: Number of observations = 3 Correlation 'r' = -0.7255 Paired Sample t-test = 2.693 P value of Paired Sample t-test = 0.1146

Table 5. Sales of Commercial, Passenger, Two-wheeler vehicles (Values in Numbers)
Source: Analysis based on the data of Annual survey of automobile industry by SIAM.
H3: H0: There is no significant difference in sales of commercial, passenger, two-wheeler vehicles before and after GST.

Table 5 shows the sale of commercial vehicles, passenger vehicles, and two-wheelers, the results of a paired t-test and correlation coefficient. There is a strong negative connection, i.e., -30%, between the sale of commercial vehicles and the sale of passenger vehicles, and a substantially negative correlation, i.e., -91%, between the two. In addition, there is a significantly negative connection in two-wheeler sales between pre and post GST implementation periods. It means that there is a negative relationship between commercial, passenger, andtwo-wheeler sales before and after the GST was implemented. The average number of commercial cars sold increased from 1542045 to 1892951, while passenger vehicle sales increased from 6980765 to 7694276. The sale of two-wheelers has also increased, from 38201179 to 4609109 units. At a significance level of 5%, the paired t-test results in the sale revealed no significant difference.

Electric Vehicles in India
Electric vehicles are gradually increasing in India, despite numerous challenges and difficulties because of the following reasons:

1. Electric vehicle incentives under FAME India, which was launched by the central government to achieve a production of 7 million EVs by 2020 and the NEMMP 2020 target
2. Low maintenance operations costs for electric vehicles.
3. Crude oil prices are rising since 80 % of crude oil is imported.

As per sources of SMEV, the sale of Electric Vehicles has been increasing rapidly; it was near about 22000 Total EVs in 2015-16 which has risen up to 155400 in the year 2019-20. There is a decrease in the 2020-21 due to the covid pandemic. Aside from the end-user consumer, the government, incentives and subsidies, and the automotive value chain business are all significant stakeholders in India's EV transition. The government assists by establishing legislation governing pollution standards, fuel economy, strategic intent and direction, incentive and subsidy research, and the development of a supportive ecosystem. The current CO2 emission target set by the Indian government, based on the Paris Climate Treaty, is 113 g/km by 2021. By 2035, the fuel efficiency average aim is 22 km/litre, in line with the Corporate Average Fuel Consumption guideline. In addition, the Indian government intends to minimize crude oil imports and indirect reliance on specific trade partners.

VI. CONCLUSION

The automotive sector is extremely important for economic growth. The development of the automotive industry is linked to that of other industries. The introduction of the GST represents a significant political shift in India's economic development. The effect of the GST on the automotive sector is studied in this research.

The survey revealed that, with the exception of China, India has a higher tax rate for four-wheeled vehicles than the top ten vehicle-producing countries. It was noted that the expansion of the automobile industry is insufficient and the profitability of automakers has declined. According to the results, there are no significant differences between pre- and post-GST production and sales of commercial, passenger and two-wheeled vehicles. However, after the GST, there has been a significant increase in exports of traditional motor vehicles in the two- and four-wheeled vehicle category, as well as a rapid increase in sales of electric vehicles.

This trend may lead India to less pollution and use of petroleum products. In addition, sales and demand in 201920 showed a slowdown due to the lockdown of covid restrictions. The government is continually striving to improve the situation. Recently, the GST on ethanol was reduced from 18% to 5%. In addition, most cars are taxed at the maximum rate of 28% under the GST scheme, plus a tax based on engine capacity. However, the automotive sector can grow if petroleum products are subject to the GST.

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