International Journal of Trade and Commerce-IIARTC
January-June 2022, Volume 11, No. 1 pp: 241-255
ISSN-2277-5811 (Print), 2278-9065 (Online)

COSMOS (Germany) JIF: 5.135; ISRA JIF: 7.249; ISI JIF: 3.721

Present Status & Future of Automobile Industry in India

Jyoti Singh[a], K. K. Verma[b]*
[a&b]Department of Commerce, Hemvati Nandan Bahuguna Garhwal, SRT Campus, Tehri, Uttarakhand, India
E-mail: Jyotisngh01@gmail.com[a], profkkverma3@gmail.com[b]

Abstract
Automobile Industry plays an important role in the economic development in our country. Automobile Industry comes at fourth place in the world Automobile Sector in the term of sale of vehicles. The data of production and market sale (Domestic sales and Export) of different types of vehicles i.e. passenger, commercial, three-wheeler, two-wheeler, and quadricycle for seven years i.e. 2015-16 to 2021-22 were analysed with the help of multiple regression analysis, then we found that there is good relationship between export and production and domestic sale of vehicles. Domestic sales and production of vehicles are good variant to forecast the export. The production of different types of vehicles was decreased from 5.46 percent during 2015-16 to 1.23 percent in the year2021-22.It is also seen from the analysis that domestic sale also decreases from 85.23 percent to 76.37 percent in the study periods. However, the export of the mention vehicles was increased in the positive trend i.e. 15.17 percent to 24.49 percent of the study period. This study is based on secondary data which were collected from SIAM website of Automobile sector. The compound annual growth rate was computed and prediction of production, domestic sale and export were estimated next seven years i.e. 2022-23 to 2028-29.We found that there is decreased in the growth rate of export of vehicles, it's main reason is impact of covid-19.

Key Words: *Growth, Automobile, Production, Domestic sales, Export Trend, Compound Annual Growth Rate (CAGR), Regression Analysis.*

PAPER/ARTICLE INFO
RECEIVED ON: 02/05/2022
ACCEPTED ON: 29/05/2022

Reference to this paper should be made as follows:

Singh, Jyoti & Verma, K. K. (2022), "Present Status & Future of Automobile Industry in India", *Int. J. of Trade and Commerce-IIARTC*, Vol. 11, No. 1, pp: 241-255

**Corresponding Author*
DOI: 10.46333/ijtc/11/1/23

1. Introduction

Automobile Industry is one of the largest sectors in India which contribute a large share in the GDP of a country. Our country is the fourth largest automobile market share in the world during 2022.The automobile sector lead's the capital goods. It comprises Passenger Vehicles such as passenger cars, multipurpose vehicles, Commercial Vehicles which may light and medium-heavy vehicles. In other cases, Three-wheelers that are passenger and goods carriers. The Two- wheelers such as mopeds, scooters, motorcycles and Quadricycle which needs fuels both petrol and diesel. In addition to this, one more type of vehicle being popularized i.e. Electric vehicle. Our Finance Minister, Mrs. Nirmala Sitharaman focus on Automobile sector at the time of presentation of Union Budget 2022. (www.businesstoday.in)

Our Government focussed reform to the Production Incentive Scheme (PLI) and also auto & Advanced Chemistry Cell (ACC). PLI Scheme has provided an opportunity to make Bharat shelf reliant by way of manufacturing products with the help of using advanced automobile technology within the country. The Automotive Mission Plan 2006-2026 (AMP 2026) is the collective vision of Government to upgrade and update the Indian Automotive Industry on where the vehicles ,Auto-components and Tractors Industries should reach at target level and over during the next ten years in term of size ,contribution to India's development global footprint, technological maturity competitiveness and institutional structure and capabilities. The National Electric Mobility Mission Plan 2020 aims to achieve national fuel security by promoting hybrid and electric vehicles in the country. There is an ambitious target to achieve 6-7 million sales of hybrid and electric vehicles year on year from 2020 onwards. National Automobile testing and R&D Infrastructure project (NATRIP), This project has been set up at a total cost of USD 573 mn to enable the industry to adopt and implement global performance standards. It aims at converting India's unparallel strengths in IT and electronics with the automotive engineering sectors. Hon'ble Prime Minister, Shri Narendra Modi has given its approval to introduce the Production –Linked Incentive (PLI) scheme in Automobile and Automobile Components sector through the Department of Heavy Industries of with a financial outlay of INR 57,042 cr over a five –years period for enhancing India's Manufacturing capabilities and Enhancing exports-Atmanirbhar Bharat. Make in India initiative have boosted the automobile manufacturing industry in the country and as a result we will witness a marvellous growth in the industry over a period of time. The Vehicles Scrapped Policy 2021 has been introduced by the Prime Minister of India in Gujarat at an Investor summit. The Indian auto industry is expected to record strong growth in 2022-23, post recovering from effects of COVID-19 pandemic. Electric Vehicles, especially two-wheelers are likely to witness positive sales in 2022-23.

2. LITERATURE REVIEW

Arya N. (2019), studies the automobile performance and Growth in India and examined that domestic sales of vehicles are strong mean that the demand for vehicles is strong with the support of government policies have led climbing up the Indian Automobile Industry. Data is collected from secondary source i.e. from SIAM website.

Chattopadhyay M. & Mukherjee S. (2019), studies the automobile production trend and Foreign Direct Investment (FDI) in Automobile sector, find out the correlation between Automobile production and FDI, Automobile Export trend, Automobile Domestic sales trend, Gross turnover

trends in Indian Automobile Industry over last decade. In this paper researcher collect data from secondary source i.e. authentic book, newspaper and related website. Data analysis with the help of statistical tool like average, percentage, compound Annual Growth Rate, Average Annual Growth Rate, and Correlation trend analysis.

N., Chandrasekar & Palanivelu, V. R. (2018), study that growth rate of two wheelers was higher than other types of vehicles and analyses the trend and growth of automobile industry in India. The data is analysed with the help of simple percentage, mean, standard deviation, coefficient of variation and compound annual growth rate as the study period. It is also found from the study export of automobile from India was increased considerably.

Kaur, A. (2020), examined Automobile Industry performance, data is collected from secondary source, recorded data is measured by calculating Compound Annual Growth rate, Y-O-Y growth of production, total export share, trade balance, compound annual growth rate of export market share in world and revealed comparative advantage of automobile industry.

Kanupriya & Kumar, S. (2014), studies FDI and de-licensing bring rapidly growth in Automobile Industry and enter into global market. In this paper trend of FDI inflow in Automobile Industry shown from 2004 to 2014 and results FDI inflow and production is in increasing mode. This paper is based on secondary source, data is collected from publication as, SAIM, DIPP, RBI and other government agencies. It is based on descriptive research. In this paper data analysis with the help of Time Series analysis, study the trend of production of automobile sector.

Sankaran, P. (2016), discussed about the current scenario of Automobile Industry show that it is the seven largest producing countries. In 21st centuries automobile sector producing and assembling all types of vehicles. In this paper researcher explain the vision of Indian Automobile Industry '2020'.

Suresh, R. & Chandrasekhar, G. (2018), explain Indian automobile industry's growth and development. In this paper studies that automobile industry provide employment i.e. job opportunities to people and future expectation of Indian automobile is to be briefly explain with respect to Foreign Direct investment, Infrastructure, Upgradation of technology, aspect of environment, GDP, statistics of current automobile Disposal Income of people, cluster and quality aspect.

S., Jatinder (2014), studies changing policy lead to growth and development in Indian Automobile Industry. The effect changing Policy of economic development bring competitive advantage. It is to be seen that, during last three-year result show the contribution to growth and export in Indian Automobile Industry. Basically, seen that passenger vehicles, had positively affect the export in growth and improvement. It is found that Indian Automobile Industry segment of total export have to be double over the years.

Manickkavasagam, N. & Radhika, R.R. (2019), studies current scenario of growth and the performance of Indian Automobile Industry and GST implementation shows the negative result on export of cars and worth Rs. 2000 crore refunded of tax provided by Indian government to respective companies. Data is collected from secondary source i.e. SIAM website and analyse the comparative statement of Domestic sales for February 2018.

Miglani, S. (2019), observed that automobile industry is one of the key driver for growth of economic in India and play important role global value chain with higher participation level in global market. In this paper analyse government policy, infrastructure and other enabling factor

play role in expansion of Automobile sectors. Data is collected from secondary source. In this paper author explain the Automobile journey from 1950, analyse the CAGR of production of Domestic Sales, Export of passenger, commercial, Three-wheeler, Two-wheeler vehicles from 1995-2000, 2001-2010 and 2011 -2018.

3. STATEMENT OF PROBLEM

For establishment of Automobile Industry needs heavy investment of capital, higher level of technological knowledge with sufficient labour force and administrative support of local government. In our country very, limited number of industry man have the background information for starting automobile company in India. There are many other factors have relation with establishment of automobile companies like availability of raw materials and transport facilities for bringing out raw material at the company site which may higher taxable may not be affordable by the authority of automobile company. The slow growth of automobile Industry in our country may be the cost .But an last few years the situation of above condition s improve and an automobile companies started grow up. It is interesting to mention that petrol and diesel vehicles developed/polluted environment. Therefore, production and sale of such vehicles hindrance and CNG/LPG/Hybrid vehicles taken place in the market which required the change of internal infrastructure at manufacturing point which required heavy investment and technology know-how.

4. OBJECTIVES OF STUDY

[i] To find the relationship between export, production and domestic sales of vehicles.
[ii] To study the domestic sale and export of automobiles.
[iii] To calculate the Forecast of production, domestic sale and export of Automobiles.

5. RESEARCH METHODOLOGY

The secondary data with related to the production of different types of vehicles along with domestic sale and export during the year from 2015-16 to 2021-22 were collected and used for Multiple Regression Analysis and found the relationship of export, domestic sales and the production of automobile data. The produced vehicles were classified into four segments namely passenger vehicles, commercial vehicles, three-wheeler, two-wheeler.

Table 1: Change in Production during respective years over previous year from 2015-16 to 2021-2022

Category	Changes in Production during 2016-17 over 2015-16	Changes in Production during 2017-18 over 2016-17	Changes in Production during 2018-19 over 2017-18	Changes in Production during 2019-20 over 2018-19	Changes in Production during 2020-21 over 2019-20	Changes in Production during 2021-22 over 2020-21
Passenger Vehicles	9.72	5.75	0.24	-14.99	-10.58	19.21
Commercial Vehicles	2.99	9.51	24.23	-31.97	-17.41	28.90

Three-Wheeler	-16.10	30.43	24.13	-10.71	45.75	23.34
Two-Wheeler	5.86	16.16	5.81	-14.15	-12.76	-3.46
Quadricycle	198.30	8.14	214.64	13.12	-37.06	5.86
Grand Total	5.47	14.86	6.26	-14.76	-14.03	1.23

Source: Authors' Calculation

The above table revealed the percentage change in different types of vehicles produce in different years from 2015-16 to 2021-22. It is seen that maximum changes were observed nearly 215% increased of the production of Quadricycle vehicle among all types of vehicles shown in the table during 2018-19 over the previous year. It is further observed from the table that the change in production of all types of vehicles was negative during 2019-20 over 2018-19 and 2020-21 against 2019-20 accept the vehicle quadricycle during the year 2019-20 and three-wheeler in the year 2020-21 over the previous years. The production of such type of vehicles were positive than that of other types of vehicles, this indicated the disposal of these vehicles was higher as compare to other types of vehicles produce during a respective year. This may be due to higher demand and low cost in respect of counter parts. It is further reported in the table the percentage change in production all types of vehicles listed in table was positive. This shows the quality of listed vehicles may be better caused the higher demand of the vehicles in different study years.

Table 2: Change in Domestic Sales Trend during respective years over previous year from 2015-16 to 2021-2022

Category	Changes in Domestic Sale during 2016-17 over 2015-16	Changes in Domestic Sale during 2017-18 over 2016-17	Changes in Domestic Sale during 2018-19 over 2017-18	Changes in Domestic Sale during 2019-20 over 2018-19	Changes in Domestic Sale during 2020-21 over 2019-20	Changes in Domestic Sale during 2021-22 over 2020-21
Passenger Vehicles	9.26	7.90	2.70	-17.88	-22.38	13.20
Commercial Vehicles	4.14	20.00	17.55	-28.76	-20.77	26.03
Three-Wheeler	4.89	24.19	10.27	-9.12	-65.55	18.93
Two-Wheeler	6.89	14.84	4.85	-17.77	-13.18	-10.94
Quadricycle	00	00	00	50.24	101.27	1133
Grand Total	6.81	14.26	5.14	-17.97	-13.58	-5.94

Source: Authors' Calculation

From the above table it has been observed that the percentage change in domestic sales of different types of vehicles during the year 2015-16 to 2021-22. The maximum change (1133%) was made during 2021-22 over 2020-21 of quadricycle types of vehicles. This may be due to best choice

of the users among other types of vehicles in listed in the table. Further, such types of vehicle may be economically sound for their maintenance and also such vehicles may be useful for another social work. It is interesting to mention here that none of the changes were made in domestic sales of such vehicles during the year 2016-17, 2017-18 and 2018-19 over their respective previous years. The domestic sales continuous three year all type of vehicles was positive, this indicated the disposal of these vehicles was higher as compare to other types of vehicles sale during a respective year. This may be due to low demand and high cost in respect of counter parts. It is further reported in the table the percentage change in domestic sale of all types of vehicles listed in table was negative. This indicated there was slow market condition of such vehicles during the mention years. The negative sale of different vehicles shown in the table indicated the lesser demand of such vehicles during the year over previous years. This may reflect income and profit level of company from particular types of vehicles during the mention years. This may be due to the change of consumer behaviour in respect of the old model of the vehicles and required new model of the available different types of vehicles.

Table 3: Trend of Export Sales (Automobile) in Numbers

Category	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-2022
Passenger Vehicles	653,053 (18.85)	758,727 (19.96)	748,366 (18.61)	676,192 (16.78)	662,118 (19.33)	404,397 (13.20)	577,875 (15.83)
Commercial Vehicles	103,124 (13.11)	108,271 (13.36)	96,865 (10.82)	99,933 (8.98)	60,379 (7.98)	50,334 (8.05)	92,297 (11.46)
Three-Wheeler	404,441 (43.30)	271,894 (34.69)	381,002 (37.27)	567,683 (44.74)	501,651 (44.28)	393,001 (63.94)	499,730 (65.92)
Two-Wheeler	2,482,876 (13.18)	2,340,277 (11.74)	2,815,003 (12.16)	3,280,841 (13.39)	3,519,405 (16.73)	3,282,786 (17.89)	4,443,018 (25.08)
Quadricycle	334 (62.90)	1,556 (98.23)	1,605 (94.24)	4,400 (81.66)	5,185 (85.07)	3,529 (92)	4,326 (106.52)
Grand Total	**3,643,828 (15.17)**	**3,480,725 (13.74)**	**4,042,841 (15.49)**	**4,629,049 (14.97)**	**4,748,738 (18.02)**	**4,134,047 (18.25)**	**5,617,246 (24.49)**

1. Source: SIAM reports 2. Figures in Parentheses indicated percentage to total

The export trend of different types of vehicles i.e. Passengers, Commercials, three-wheelers, two wheelers and quadricycles vehicles from 2015-16 to 2021-22 are shown in Table -3. It is seen from the table that trend of export of passenger vehicles varied between 19.96 percent in 2016-17 to 13.20 percent in 2020-21, commercial vehicles from 13.36 percent in 2016-17 to 7.98 in 2019-20. However, the export trend of three wheelers was lower 34.69 percent in 2016-17 and was higher 65.92 percent during 2021-22. It was further noticed from the table that the export trend of two wheelers was lower 11.74 percent in 2017-18 than that of other financial years while the trend export of quadricycle was higher 106.52 percent in 2021-22 over other reported years. Overall export trend together of different vehicles varied between 13.74 percent to 24.49 percent in 2016-17 and 2021-22 respectively followed by 15.17 percent in 2015-16. The export of vehicles in the international market may be depend on the better quality of technology and material used for

manufacturing the vehicles which reflect the durability of vehicles, which may also reflect the interest of consumer and pocket basket. Further, the consumer need of particular type of vehicle because commercial vehicles generally purchased by consumer with the interest of source of income in the business existing in the international market. While, two-wheelers generally used by consumers for their personal convenient.

In April-March 2022, overall automobile exports increased by 35.88 percent. Passenger vehicles, commercial vehicles. Three wheelers and two-wheeler exports are also increased by 42.89 percent, 83.36 percent, 27.16 percent, and 35.34 percent respectively. The quantity of Export sale during the year divided by the quantity of production in the respective year multiplied by 100. (Export /Production *100)

Table-4: Change in Export during respective years over previous year from 2015-16 to 2021-2022

Category	Changes in Export during 2016-17 over 2015-16	Changes in Export during 2017-18 over 2016-17	Changes in Export during 2018-19 over 2017-18	Changes in Export during 2019-20 over 2018-19	Changes in Export during 2020-21 over 2019-20	Changes in Export during 2021-22 over 2020-21
Passenger Vehicles	16.18	-1.37	-9.64	-2.08	-38.92	42.90
Commercial Vehicles	4.99	-10.53	3.17	-39.58	-16.64	83.37
Three-Wheeler	-32.77	40.13	48.99	-11.63	-21.66	27.16
Two-Wheeler	-5.74	20.28	16.55	7.27	-6.72	35.34
Quadricycle	365.86	3.15	174.14	17.84	-31.94	22.58
Grand Total	-4.47	16.15	14.50	2.59	-12.93	35.88

Source: Authors' calculation

The above table revealed the percentage change in different types of vehicles export in different years from 2015-16 to 2021-22. It is seen that maximum changes were observed nearly 366% increased of the export of Quadricycle vehicle among all types of vehicles shown in the table during 2016-17 over the previous year. It is further observed from the table that the change in export of all types of vehicles was negative during 2020-21 over 2019-20 and the change in export of all types of vehicles was positive during 2021-22 over 2020-21. The export of such type of vehicles were positive than that of other types of vehicles, this indicated the disposal of these vehicles was higher as compare to other types of vehicles produce export a respective year. This may be due to higher demand and low cost in respect of counter parts. It is further reported in the table the percentage change in export all types of vehicles listed in table was positive. This shows the quality of listed vehicles may be better caused the higher demand of the vehicles in different study years.

Table 5: Total of Production, Domestic Sale and Export of Vehicles during 2015-16 to 2021-2022

Category	Production	Domestic Sale	Export
Passenger Vehicles	25452995	21057235	4480728
Commercial Vehicles	5791989	5266731	611203

Three-Wheeler	6514522	3504296	3019402
Two-Wheeler	143516305	121429180	22164206
Quadricycle	23208	1681	20935
Grand Total	**181299019**	**151259123**	**30296475**

Source: Authors' Calculation

Table No-5 revealed the production, Domestic Sales and export done during last seven year i.e. 2015-16 to 2021-22. From the table, it has been observed among five type of vehicles, total production, Domestic sales and export were higher of two-wheeler followed by passenger vehicles and commercial vehicles. It is further seen that lower production, Domestic sale and export was quadricycle. The higher production of two-wheelers and their sale in country level as well as international level were higher, which may be due to better demand of such vehicles and the price of such vehicles is affordable at vehicles user. Therefore, such vehicles have higher level at production and sale point as compared to other types of vehicle included in the present study.

6. ANALYSIS OF DATA

Table 6: Correlation

		Export of Vehicles	Production of Vehicles	Sales of Vehicles
Pearson Correlation	**Export of Vehicles**	1.000	.995	.993
	Production of Vehicles	.995	1.000	1.000
	Sales of Vehicles	.993	1.000	1.000
Sig.(1-tailed)	**Export of Vehicles**	.	.000	.000
	Production of Vehicles	.000	.	.000
	Sales of Vehicles	.000	.000	.
N	**Export of Vehicles**	5	5	5
	Production of Vehicles	5	5	5
	Sales of Vehicles	5	5	5

Source: Authors' Calculation

Table 7: ANOVA

Model	Sum of square	df	Mean square	F	Sig.
Regression 1	337239686146201.060	2	168619843073100.530	70356.082	.000
Residual	4793326721.707	2	2396663360.853		
Total	337244479472922.750	4			

Source: Authors' Calculation, Dependent Variable: Export of Vehicles, Predictors (constant), Sales of Vehicles, Production of Vehicles

Table 8: Residual Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	72702.7422	22171660.0000	6059294.8000	9182043.42925	5
Residual	-51767.74219	37156.66016	.00000	34616.92766	5
Std. Predicted Value	-.652	1.755	.000	1.000	5
Std. Residual	-1.057	.759	.000	.707	5

Source: Authors' Calculation, Dependent Variable: Export of Vehicles

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimator	Change Statistics				
					R Square Change	F Change	Df1	Df2	Sig. F Change
1	1.000	1.000	48955.72858	1.000	70356.082	2	2	2	.000

Source: Authors' Calculation. Predictors (constant), Sales of Vehicles, Production of Vehicle, Dependent Variable: Export of Vehicles

Table 10: Coefficient

Model	Unstandardized Coefficient		Standardized Coefficient	t	Sign.	Correlation		
	B	Std. Error				Zero order	Partial	Part
1. Constant	51529.536	30385.775		1.696	0.232			
Production of Vehicles	0.983	.023	6.502	42.795	.001	.995	.999	.114
Sales of Vehicles	-0.980	.027	-5.508	-36.250	.001	.993	-.999	-.097

Source: Authors' Calculation, Dependent Variable: Export of Variables

- **Multiple Regression Model of Vehicles**

The algebraicform of Linear Function

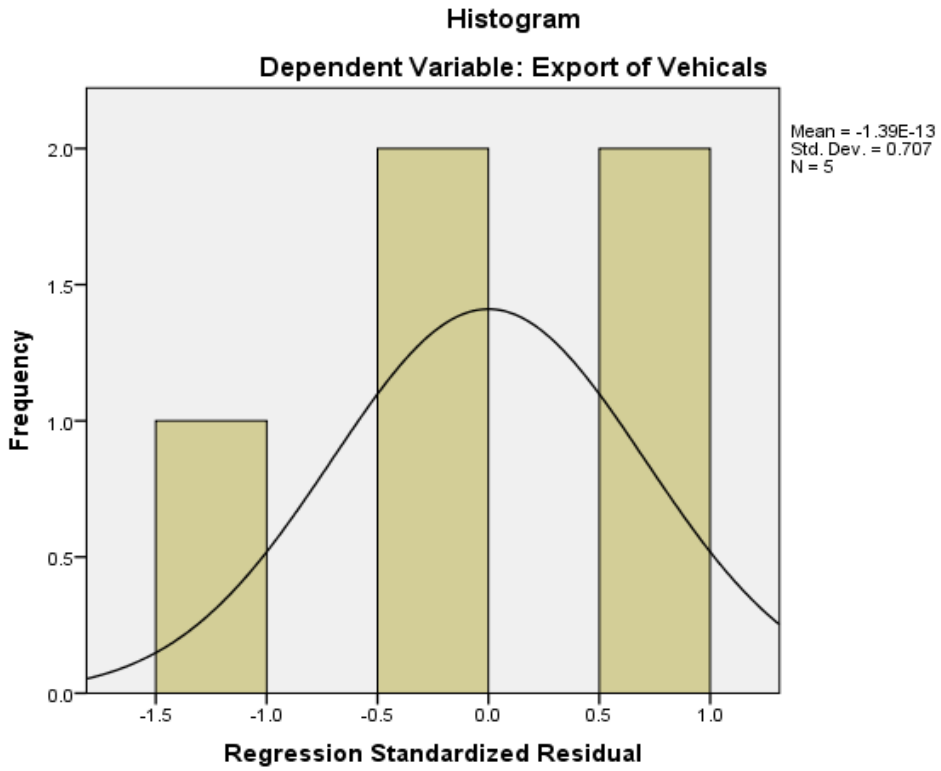
Y = a + β1 X_1 + β2 X_2.....Xn βn + €

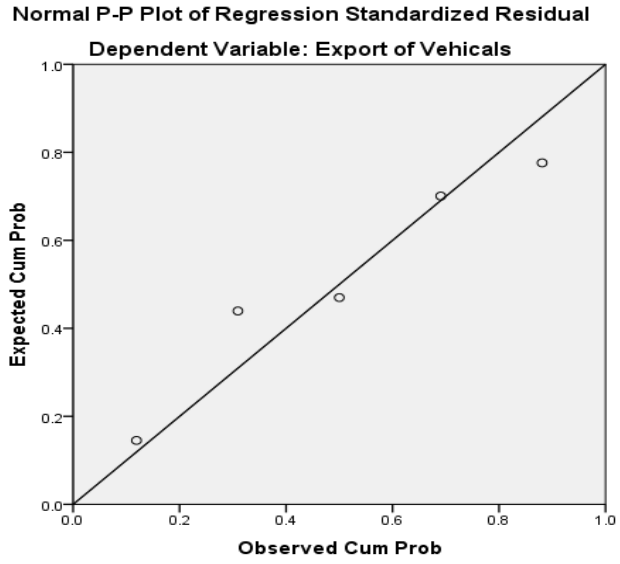
Whereas, Y = Dependent Variable, a = Constant, f = function

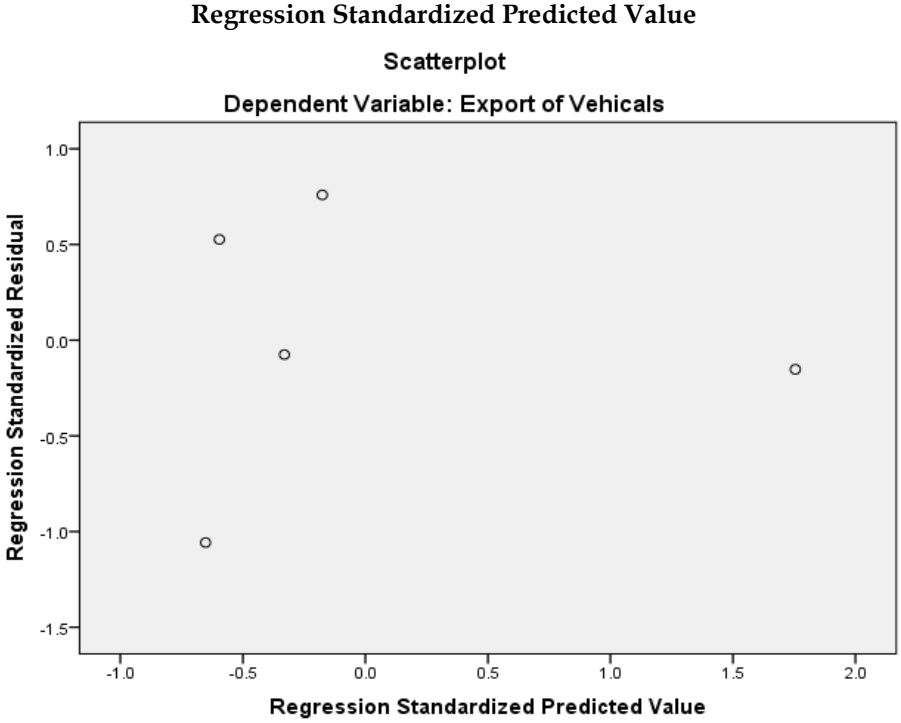
X_1, X_2, …….Xn = Independent Variables, β1, β2 …... βn = Correlation Coefficient, € = Error

Y = 51529.536 + 0.983 * Production - 0.980 * Domestic Sales

Diagram of Histogram Regression Standardized Residual Curve







- **CAGR (Compound Annual Growth Rate)**

Formula = $(FV/IV)^{1/N} - 1$, FV = Final Value**, IV=**Initial Value**, N=**Year (period)

Table 11: CAGR of Production, Domestic Sale and Export of Automobile Vehicles

Category	Production (%)	Domestic Sale (%)	Export (%)
Passenger vehicles	1	2	-2
Commercial Vehicles	0	1	-2
Three-Wheeler	-3	-11	4
Two-Wheeler	-1	-3	10
Quadricycle	40	-42	53
Grand Total	-1	-3	7

Source: Authors' Calculation

The said Table revealed the compound Annual Growth Rate of different categories of vehicles produced and their Domestic and export sale from 2015-16 to 2021-22. It is seen from the table that highest CAGR was 40 percent of quadricycle vehicles followed by 1 percent CAGR of passenger vehicles in case of production. The negative CAGR estimated in case of Three-wheeler, two-wheeler and overall situation of vehicles production.

In case of sale of the vehicles in domestic and export situation, the value of CAGR of export of vehicles was higher than that of sale of domestic CAGR. It is interesting to mention here that the CAGR of domestic sale of passenger and commercial vehicles was positive and higher as compared to CAGR of export which was negative and lower of the respective vehicles during the study period i.e. 2015-16 to 2021-22. The reverse situation was observed in case of three wheeler, two wheeler, and quadricycle.

- **Formula of CAGR in Excel**

CAGR = Rate (Year, 0, IV, -FV),
0=Adding amount in measurement during investment period here i.e. 6 year (7-1)

Table 12: Forecasting of Production from 2022-23 to financial year 2028-29

Financial Year	Passenger Vehicles	Commercial Vehicles	Three-Wheeler	Two-Wheeler	Quadricycle	Total
2022-23	3419353	762735	822723	19268669	6098	24279578
2023-24	3365156	746562	795742	18960254	6793	23874507
2024-25	3310958	730389	768761	18651839	7489	23469436
2025-26	3256761	714216	741780	18343425	8184	23064366
2026-27	3202564	698042	714799	18035009	8880	22659294
2027-28	3148367	681870	687819	17726595	9576	22254227
2028-29	3094169	665696	660838	17418179	10271	21849153
CAGR	**-2%**	**-2%**	**-4%**	**-2%**	**9%**	**-2%**

Source: Authors' Calculation

The above table revealed the projected data of different types of vehicles would be produced during 2022-23 to 2028-29, which may help in the planning of available different types of i.e. land, labour, capital marketing strategies, budgeting, rebudgeting, price and resource uncertainty and their management and utilisation of different skilled for production of different types of vehicles during mention year. It will directly related to the profit and loss of the company and shifting the company goal from one type vehicles to another vehicles which will reduce the financial and resource risk and introducing new brand of vehicles for better competition in the market situation. The forecast of the target may be helpful in the production of vehicles of consumer and market demand. Fixing the target of the production of different types of vehicles based on old model vehicles and introduction of new model of vehicle as per the market and time demand would be better for running the company at profit levels.

Table 13: Forecasting of Domestic Sales from 2022-23 to Financial year 2028-29

Financial Year	Passenger Vehicles	Commercial vehicles	Three-wheeler	Two-wheeler	Quadricycle	Total
2022-23	2958685	704135	298451	14962753	424	18924448
2023-24	2946312	692072	247911	14366684	470	18253449
2024-25	2933939	680009	197370	13770616	516	17582450

2025-26	2921567	667944	146829	13174548	563	16911451
2026-27	2909194	655881	96288	12578479	609	16240451
2027-28	2896821	643817	45748	11982411	655	15569452
2028-29	2884448	631753	-4793	11386343	701	14898452
CAGR	**0%**	**-2%**	**---**	**-4%**	**9%**	**-4%**

Source: Authors' Calculation

The above table revealed the projected data of different types of vehicles would be sold within country during the period of 2022-23 to 2028-29, which may help in the resource planning i.e. land, labour, capital marketing strategies, budgeting, rebudgeting, prices of different resources, resources uncertainty, their management and utilisation of different manpower skilled for production of different types of vehicles during mention years. This may be directly related to the profit and loss of the company and will suggest to shift the company goal over one type vehicles to another type vehicles which will reduce the financial and resource risk and introducing new brand of vehicles for better competition and profit level through covering the large area of the market situation. The forecast of the sale target of domestic level may be helpful to the consumer and market demand. Fixing the target of the domestic sale of different types of vehicles based on old model vehicles and introduction of new model of vehicle as per the market, consumer and time period demand would be better for running the company at higher level of profit.

Table 14: Forecasting of Export trend from 2022-23 to the financial year 2028-29

Financial Year	Passenger Vehicles	Commercial vehicles	Three-wheeler	Two-wheeler	Quadricycle	Total
2022-23	494326	60909	524019	4376293	5777	5461324
2023-24	457882	54307	547188	4678788	6473	5744638
2024-25	421438	47706	570357	4981282	7169	6027952
2025-26	384993	41104	593526	5283777	7866	6311266
2026-27	348549	34503	616694	5586271	8563	6594580
2027-28	312105	27902	639863	5888765	9259	6877894
2028-29	275660	21300	663032	6191260	9956	7161208
CAGR	**-9%**	**-16%**	**4%**	**6%**	**9%**	**5%**

Source: Authors' Calculation

The above table revealed the projected data of different types of vehicles would be sales outside the country during 2022-23 to 2028-29, which may help in the planning of available different types of i.e. land, labour, capital marketing strategies, budgeting, rebudgeting, price and resource uncertainty and their management and utilisation of different skilled for production of different types of vehicles during mention year. It will directly related to the profit and loss of the company and shifting the company goal from one type vehicles to another vehicles which will reduce the financial and resource risk and introducing new brand of vehicles for better competition in the international market situation. The forecast of the target may be helpful in the export of vehicles

in international market. Fixing the target of the export of different types of vehicles based on old model vehicles and export of new model of vehicle as per the international market and time demand would be better for running the company at profit levels in international market.

7. LIMITATION

The present manuscript is restricted seven years data of production, sale at domestic and export level. The ten years data may be better for good results of automobiles vehicles. Hybrid and CNG vehicles is not included in the present study.

8. FINDINGS

From the study it has been found that different types of vehicles i.e. Passenger, commercial, three-wheeler and quadricycle vehicles were produced by automobile companies during 2015-16 to 2021-22. Among them the higher production of two-wheeler were observed in the study years followed by passenger vehicles. However, the Change in production of all types of vehicles was seen negative during 2019-20 over 2018-19 and 2020-21. The production of three -wheeler in the year 2020-21 over the previous years was seen negative also. So far as disposal of different type of vehicles produced during study period, it is revealed that overall domestic sales of different vehicles ranged from 76.37 percent in 2021-22 to 86.31 percent during 2016-17 followed by 85.23 percent in 2015-16. It is further observed that the domestic sales of all types of vehicles was positively increased with the advancement of the years during subsequently years 2015-16 to 2018-19. In case of export of all types of vehicles, the trend of export together of different vehicles varied between 13.74 percent to 24.49 percent in 2016-17 and 2021-22 respectively followed by 15.17 percent in 2015-16. Further, it is estimated that change in export of all types of vehicles was observed negative during 2020-21 over 2019-20. However, the change in export of all types of vehicles was seen positive during 2021-22 over 2020-21.This indicated that no clear trend was seen during 2019-20 to 2021-22. The situation was fluctuating this may be due to demand and supply of the vehicles during the respective years. Compound Annual Growth Rate (CAGR) was estimated all types of vehicles in case of production and disposal of these vehicles. The higher CAGR was 40 percent in case of quadricycle vehicles production followed by 1 percent in case of passenger vehicles. In other cases, the CAGR was negative in their production.

9. CONCLUSION & SUGGESTION

The production of different of automobile vehicles and their disposal at domestic and export level were directly related to the market demand in different years. It may be suggested strong market strategy needs to be developed for better result of sale and export in favour of different types of vehicles needed by the consumer/users. To improve the automobile industry needs to be developed new advancement technology as international product and focus on environmentally friendly product as electric vehicles and provide more better service to Indian market.

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