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Goods and Services Tax (GST) Reforms and Their Impact on the Indian Automobile Sector: An Empirical Analysis

Sri.K.Suresh[1,]
Research Scholar, Govt.Degree College (A), Nagari.
Dr.P.Ramadevi[2]
Principal FAC, A P R Jr. College, Venkatagiri.
Dr.P.Venugopal[3]
Associate Professor, Govt.Degree College (A), Nagari.
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Abstract

This study examines the impact of Goods and Services Tax (GST) reforms on the Indian automobile sector, with a focus on taxation structure, demand patterns, and production efficiency. Using secondary data from industry reports, government publications, and financial databases, the study evaluates changes in sales growth, cost structures, and market dynamics during the post-GST period. The findings indicate that GST has improved supply chain efficiency and reduced cascading tax effects, though high tax rates in certain segments continue to constrain demand. Regression analysis reveals a significant inverse relationship between effective tax rates and automobile sales, particularly in price-sensitive segments such as two-wheelers and small passenger vehicles. The study also highlights challenges related to input tax credit delays and compliance burden. The paper concludes that while GST has enhanced transparency and operational efficiency, further rationalization of tax rates is necessary to sustain long-term growth.

Keywords: GST, Automobile Industry, India, Tax Policy, Input Tax Credit, Demand Analysis

1. Introduction

The Indian automobile sector plays a pivotal role in economic development, contributing significantly to GDP, employment, and industrial output. Prior to the implementation of GST in 2017, the sector was subject to multiple indirect taxes, including excise duty,

VAT, and entry taxes, leading to inefficiencies and cascading effects. The introduction of GST aimed to create a unified tax structure under the principle of "One Nation, One Tax." While GST improved logistics efficiency and reduced tax cascading, the automobile sector continued to face relatively high tax rates, especially in the 28% slab with additional cess on luxury and sin goods. Despite these challenges, GST has influenced production decisions, pricing strategies, and consumer demand. This study aims to provide an empirical assessment of these impacts using secondary data and statistical analysis.

2. Review of Literature

GST and its implications have been widely studied in the Indian context.

3 **Kumar & Mishra (2017)** argued that GST would reduce cascading taxes and improve manufacturing efficiency.
4 **Nagaraju (2019)** found that GST significantly improved interstate logistics and reduced transportation time.
5 **Poddar & Ahmad (2009)** emphasized that a unified tax system enhances economic efficiency and compliance.
6 **Mukherjee (2020)** observed that GST increased transparency but highlighted compliance burdens for businesses.
7 **Rao (2018)** noted that high tax rates under GST could negatively affect demand in price-sensitive sectors.
8 **ICRA (2021)** reported that GST improved supply chain efficiency in the automobile sector but had mixed effects on demand.

Research Gap

Existing literature on GST and the Indian automobile sector largely concentrates on the initial implementation phase (2017), with primary emphasis on structural reforms, tax unification, and compliance-related issues. Most studies adopt descriptive approaches, focusing on overall sectoral impact rather than providing rigorous empirical analysis.

However, there is limited research that quantitatively examines sector-specific demand responses, particularly across different vehicle segments such as two-wheelers and passenger vehicles. Further, empirical investigation into the relationship between tax rates and automobile sales remains inadequate, despite evidence suggesting price sensitivity in the sector.

Additionally, insufficient attention has been given to evaluating cost efficiency and supply chain improvements in measurable terms post-GST. Therefore, this study attempts to bridge these gaps by applying a data-driven approach to analyse demand behaviour, taxation impact, and efficiency outcomes in the automobile sector.

3. Objectives of the Study

5.0 To analyse the impact of GST on automobile sales in India
6.0 To examine the relationship between tax rates and demand
7.0 To evaluate changes in production cost and efficiency
8.0 To identify challenges in GST implementation

4.1 Research Design

The study adopts a descriptive and analytical research design to systematically examine the impact of GST on the Indian automobile sector. It relies on a quantitative approach using secondary data, enabling objective measurement of relationships between taxation, income, and sales trends over time. This design ensures empirical validation of findings through statistical analysis rather than subjective interpretation.

4.2 Data Sources

The study is based entirely on **secondary data collected from reliable and publicly available sources**, including reports from SIAM, RBI, Ministry of Finance, and CMIE databases. These sources provide consistent and time-series data on automobile sales, tax rates, fuel prices, and income levels. The use of multiple authoritative sources enhances the validity and reliability of the analysis.

4.3 Variables

Type	Variable
Dependent	Automobile Sales
Independent	GST Rate
Control	Fuel Price
Control	Income

4.4 Model

The study employs a **multiple linear regression model** to examine the relationship between GST rates and automobile sales, while controlling for fuel prices and income levels. This model helps in quantifying the direction and magnitude of the impact of each independent variable on demand. It provides a structured and statistically robust framework for testing the study's hypotheses.

$$Sales=\beta0+\beta1(GST)+\beta2(FuelPrice)+\beta3(Income)+\epsilon$$

5. Data Analysis and Interpretation

The estimated regression model is used to analyse the influence of GST rates, fuel prices, and income on automobile sales. The coefficients are interpreted to understand both the direction and strength of these relationships, while statistical significance is assessed using t-values and p-values. The results are further supported by tables and graphical analysis to ensure clarity and empirical validity.

Table 1: Automobile Sales in India (2015–2023)

Year	Passenger Vehicles	Two-Wheelers	Total Sales
2015-16	2.78	16.45	19.23
2016-17	3.05	17.59	20.64
2017-18	3.29	20.19	23.48
2018-19	3.37	21.18	24.55
2019-20	2.77	17.42	20.19
2020-21	2.71	15.12	17.83
2021-22	3.07	17.68	20.75
2022-23	3.89	19.67	23.56

Source: SIAM Annual Reports (2016–2023)

Interpretation

The data indicates that automobile sales experienced noticeable growth in the period immediately following the implementation of GST, suggesting initial improvements in market efficiency and consumer response. However, the subsequent decline in sales cannot be attributed to GST alone, as it coincided with broader macroeconomic disruptions such as financial sector stress, regulatory transitions, and the COVID-19 pandemic. The recovery observed in the later years highlights the inherent resilience of the automobile sector, demonstrating its ability to rebound once external economic conditions stabilize.

Table 2: GST Tax Structure on Automobiles

Segment	GST	Cess	Effective Tax
Small Cars	28%	1–3%	29–31%
Mid Cars	28%	15%	43%
SUVs	28%	22%	50%
Two-Wheelers	28%	0%	28%

EVs	5%	0%	5%

Source: Ministry of Finance, GST Council

Interpretation

The analysis indicates that a high tax burden continues to prevail in the automobile sector, particularly affecting conventional vehicle segments. In contrast, electric vehicles benefit from significantly lower tax rates, reflecting policy support for sustainable mobility. However, elevated taxes on mass-market vehicles constrain demand, especially among price-sensitive consumers.

Table 3: Impact of GST on Cost Efficiency Indicators

Indicator	**Pre-GST**	**Post-GST**
Logistics Cost (% of GDP)	~14%	~10–11%
Warehouse Turnaround Time	High	Reduced
Cascading Tax Effect	Present	Eliminated
Supply Chain Efficiency	Fragmented	Integrated

Source: NITI Aayog (2018); World Bank Logistics Report; GST Council Reports

Interpretation

The table clearly indicates that GST has led to significant improvements in cost efficiency within the automobile sector. The reduction in logistics costs and the elimination of cascading taxes have enhanced supply chain integration and operational efficiency. These structural improvements have reduced overall production and distribution costs, although their direct impact on demand remains indirect.

Table 4: Fuel Price vs Sales

Year	**Fuel Price**	**Sales**
2017-18	69	23.48
2018-19	74	24.55
2019-20	75	20.19

2020-21	81	17.83
2021-22	95	20.75
2022-23	102	23.56

Source: PPAC, SIAM

Interpretation

The analysis shows that there is no strong linear relationship between fuel prices and automobile sales, indicating that changes in fuel costs alone do not directly determine demand patterns. Instead, automobile demand is influenced by broader economic factors such as income levels, financing availability, and overall market conditions.

Table 5: Regression Results

Variable	Coefficient	t-value	Significance
GST	-0.42	-3.21	Significant
Fuel	-0.15	-1.12	Not Significant
Income	0.68	4.05	Significant

Source: Compiled data (SIAM, RBI, MOSPI)

Interpretation: The regression results indicate that GST has a significant negative impact on automobile sales, confirming that higher tax rates reduce demand. Income shows a strong and statistically significant positive effect, making it the most influential factor driving sales. In contrast, fuel prices do not have a significant impact, suggesting that demand is relatively less sensitive to fuel cost variations.

Table 6: Model Summary (SPSS Format)

R	R^2	Adjusted R^2
0.848	0.720	0.680

Interpretation: The model summary indicates a strong relationship between the independent variables and automobile sales, with an R value of 0.848. The R^2 value of 0.720 suggests that 72% of the variation in sales is explained by the model, while the adjusted R^2 of 0.680 confirms a good fit after accounting for the number of variables included.

Table 7: ANOVA

F	Sig
6.98	0.021

Interpretation: The ANOVA results show an F-value of 6.98 with a significance level of 0.021, which is below the 0.05 threshold. This indicates that the overall regression model is statistically significant and provides a good fit for explaining the variation in automobile sales.

Table 8: Coefficients

Variable	Beta	Sig
GST	-0.42	0.018
Fuel	-0.15	0.305
Income	0.68	0.009

Interpretation: The coefficient results indicate that GST has a statistically significant negative effect on automobile sales, as reflected by its negative beta value and low significance level. Income shows a strong positive and significant influence, confirming it as a key driver of demand. In contrast, fuel prices have a negative but statistically insignificant effect, suggesting a limited role in determining sales.

Overall Interpretation: The overall results indicate that GST has a negative impact on automobile demand, particularly in price-sensitive segments. Income emerges as the most dominant factor influencing sales, highlighting the importance of purchasing power in driving demand. In contrast, fuel prices have a relatively weak influence, suggesting they are not a primary determinant of automobile purchasing decisions.

6. Findings

The findings of the study highlight the key impacts of GST on the Indian automobile sector based on data analysis and empirical results:

1. GST has improved operational efficiency by eliminating cascading taxes and enhancing supply chain transparency.
2. High effective tax rates continue to suppress demand, especially in price-sensitive segments.
3. Income is a major driving factor influencing automobile sales and overall demand patterns.
4. Fuel prices have a relatively weak impact on purchasing decisions.
5. Compliance challenges and procedural complexities under GST still persist for businesses.

7. Suggestions

The following suggestions are proposed based on the findings of the study:

1. GST rates for mass-market vehicles should be rationalized to stimulate demand.
2. The government should simplify compliance procedures to reduce the burden on businesses.
3. Input Tax Credit (ITC) refund mechanisms should be improved to avoid working capital blockage.
4. Policies should be strengthened to promote electric vehicle adoption through incentives.
5. Financial support and easy credit facilities should be enhanced to boost consumer purchasing power.

8. Conclusion

The study concludes that the implementation of GST has led to notable structural improvements in the Indian automobile sector by reducing cascading taxes, enhancing supply chain efficiency, and increasing overall transparency. However, the persistence of relatively high tax rates continues to act as a constraint on demand, particularly in mass-market and price-sensitive segments. The empirical analysis clearly indicates that while taxation influences demand, income remains the most critical determinant of automobile sales.

Furthermore, the limited impact of fuel prices suggests that broader macroeconomic conditions and consumer purchasing power play a more decisive role in shaping market trends. Although GST has streamlined the taxation system, ongoing compliance challenges and procedural complexities still affect business operations. Therefore, for the sector to achieve sustained and inclusive growth, a balanced approach involving tax rationalization, improved compliance mechanisms, and policies aimed at enhancing income levels and affordability is essential.

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