



“GST In The Fast Lane: Assessing Transformations In The Indian Automobile Sector, With A Focus On Electric Vehicles And Smes In Auto Components”

Manash Ranjan Sahoo^{1*}, Abhinav Maurya², Dr. Ajit Kumar³

^{1*,2,3}Lovely Professional University, Phagwara, Punjab, India.

Citation: Manash Ranjan Sahoo et al. (2024), Gst In The Fast Lane: Assessing Transformations In The Indian Automobile Sector, With A Focus On Electric Vehicles And Smes In Auto Components”, *Educational Administration: Theory And Practice*, 30(2), 558-573
Doi: 10.53555/kuey.v30i2.1593

ARTICLE INFO	ABSTRACT
Received -26-02 2024 Accepted-20-03- 2024	<p>This academic research explores the diverse effects of the Goods and Services Tax (GST) on the Indian automotive sector in a structured approach. Focusing on three primary objectives, the research conducts in-depth analysis, investigation, and review to provide an overview of how GST affects existing companies as well as start-ups. The first objective of the study entails a careful examination of the general impacts of GST on the Indian auto industry. By analyzing taxation schemes, compliance regimes, and financial KPIs, the research offers a comprehensive comprehension of how the adoption of GST has transformed the financial and operational environments of major industry participants. The second objective focuses on how the GST specifically affects new business ventures in the Electric Vehicle (EV) industry, exploring market dynamics, cost structures, and entry barriers. It seeks to provide a research-based evaluation of the ways in which GST has either encouraged or inhibited the establishment of new enterprises, with a focus on the sustainable mobility industry. The study's third goal investigates obstacles faced by small and medium-sized businesses (SMEs) when implementing the GST, focusing specifically on the auto component sector that supplies electric vehicle makers. The paper provides scholarly insights into the complex problems and opportunities faced by SMEs in the GST regime by an in-depth investigation of market access obstacles, taxing complexities, and compliance challenges. By addressing all of these objectives, the research contributes to our comprehension of how GST impacts the automotive sector. clarifies how it affects businesses—particularly in light of the revolutionary Electric Vehicle market—and provides insightful information to academics, industry stakeholders, and policymakers.</p> <p>Keywords: Tax, Indirect Tax, Goods and Services Tax (GST), Electric Vehicle (EV), SMEs.</p>

1. Introduction.

The implementation of GST in July 2017 led to a substantial change in the Indian automotive sector. This tax reform has triggered enormous transformation across the industry, changing market dynamics and causing extraordinary shifts. Regarding this matter, two specific areas that warrant special focus are the rapidly growing EV industry and the critical role of SMEs in the auto component sector.

The electric vehicles use in India has grown at an exponential rate, owing to a mix of legal demands, government incentives, and increased consumer environmental awareness. According to industry data, the sale of electric two-wheelers increased by a shocking 140% between 2019 and 2021, with more than 2.3 lakh units sold in the previous year alone. This rise can be attributed to a number of factors, including the FAME II (Faster Adoption and Manufacturing of Electric Vehicles) program, which provides subsidies to both manufacturers and purchasers, as well as the installation of charging infrastructure in key urban areas. The Indian government's ambitious goal of 30% electric vehicle penetration by 2030 has boosted investment in

EV manufacturing and R&D efforts, luring both domestic and international businesses to the Indian market. As a result, electric mobility solutions are no longer considered a niche market, but are gradually being accepted as viable alternatives to traditional internal combustion engine vehicles.

SMEs in the auto component industry have made a major contribution to the expansion and lasting success of the overall automotive sector. These companies are the backbone of the supply chain, meeting the different needs of vehicle manufacturers by delivering components ranging from engine parts to electronics. Despite the initial problems of GST implementation, SMEs have demonstrated tremendous resilience and adaptability. Recent statistics show that India's auto component business is primed for strong expansion, with exports increasing significantly. Auto component exports totaled USD 14.5 billion in fiscal year 2020-21, up 3.5% from the previous year. This growth trajectory demonstrates the versatility and competitiveness of Indian SMEs in the global market. The introduction of GST has simplified logistics and supply chain processes, allowing SMEs to reduce costs and increase efficiency. By switching to the GST regime, these businesses have eliminated the complications associated with several tax regimes, allowing for simpler intra-state and inter-state trading.

2. Literature Review.

Monika Sehrawat and Upasana Dhanda (December 2015) studied, "GST in India: A key tax reform" & provided an GST overview in India, detailing its features and implementation timeline. GST advantages, emphasizing its economic growth & the cascading elimination effects in the tax system. The document discusses challenges in execution and outlines the way forward, including legislative steps and ratification processes for effective GST implementation, underscoring its significance in transforming India's taxation landscape.

Anand Nayyar and Inderpal Singh (July 2017) studied, "A Comprehensive Analysis of GST in India" offers a detailed GST examination system in India, its execution, & its effects on the Indian economy. The article covers the taxation history in India, the necessity of GST, the GST Council, the rates of GST, and the obstacles and possibilities of GST. The researchers utilized a descriptive research methodology and gathered information from a variety of sources such as academic papers, official government documents, and news pieces. The article offers a thorough GST analysis system in India & how it affects the Indian economy.

Dr. R. Vasanthagopal (April 2011) studied, "GST in India: A Big Leap in the Indirect Taxation System", explores the shift from the Central excise duty and sales tax setup to the Central Value Added Tax (CENVAT) and GST in India. It examines how this shift affects different aspects of development like agriculture, manufacturing, MSMEs, housing, poverty alleviation, employment, prices, EXIM trade, GDP, & government income. The article also discusses the obstacles and barriers to the planned shift to GST, highlighting the government's dedication to implementing a seamless GST for India's economic sustainability amidst growing global competition.

Dr. Ashok Sharma & Dr. Davendrakumar Sharma (January 2018) studied, "Impact of GST on Automobile Industry in India" which explores the GST impact on India's automobile industry, focusing on its rapid growth and significant contribution to the country's GDP. The authors assess how GST has influenced domestic demand patterns, trade, pricing, manufacturing, and export trends in the automotive industry. Furthermore, the study investigates the industry's post-GST obstacles and the benefits of streamlined input tax credit across the supply chain.

Ms. R. Lavanya Kumari (July 2017) studied, "Impact of Goods and Service Tax (GST) on Indian MSMEs", discusses the relevance of GST as an essential move toward tax reform and transparency in India. It emphasizes the ongoing need to merge multiple indirect taxes into a unified tax system called GST. The document highlights the elimination of all indirect taxes and the imposition of only GST on goods and services under the GST system. It also discusses the impact of GST on Indian MSMEs, that are significant contributors to the economy and play a crucial role in both the manufacturing and services industries. The study dives into how GST will bring about changes in the MSME sector and its ramifications for the wider economy.

In November 2016, Milandeep Kour, Kajal Chaudhary, Surjan Singh, and Baljinder Kaur conducted a research, "Examining the effects of GST post its implementation." provides an today's scenario where people pay numerous taxes, that is by direct & indirect taxes, perceived as a heavy weight, are leading to a rise in corruption. Therefore, in order to address multiple taxation systems, the Central Government has opted to implement a single tax system known as GST. The implementation of GST in India is a much-awaited tax reform that holds great significance. It is a comprehensive tax system that will combine all indirect taxes from both State and central Governments, along with the whole economy, into a single national market. It is expected to reduce the burden of the existing indirect tax system and have a substantial impact on India's growth. GST includes all indirect taxes which will stimulate the economy and has been proven to be more beneficial than the existing tax system. GST will also help increase the nation's total GDP. GST is being increasingly used worldwide and countries are incorporating it into their sales tax systems. This paper

intends to illustrate the consequences of GST after it is implemented, the differences between existing Indirect Taxes and GST, and the benefits and challenges of GST post-implementation.

Viraj Dhakan Yagnesh Mohan Dalvadi conducted research on the effects of the newly implemented GST in India, finding a significant effect on various industries & daily lives of the general public. GST has replaced previous indirect taxes like Excise, Service Tax, and state Value Added Taxes, applying the same or higher rates to all goods and services. The significant transformation has had a great impact not just economically and in terms of operations, but also in terms of perception and emotions. The study aims to uncover the perceptual influence of GST implementation in India.

In February 2021, a study conducted by Mr. Abhishek Kumar Gupta and Dr. Bharat Kumar Meher analyzed the opinions of MSMEs in India on the positive aspects of GST, focusing on its implementation and effects on these businesses. It intends to evaluate MSME owners' and managers' perceptions of GST three years after its adoption. The study digs into several aspects of GST, including its influence on tax burden reduction, simplicity in comparison to the previous tax system, tax rate uniformity, prevention of black money, improved tax revenue, and company transparency. It also examines the expectations and hopes of the government, the general public, and taxpayers regarding GST. The research intends in concluding the taxpayers' present GST perceptions, as well as the ramifications for businesses, policymakers, scholars, and bankers.

Basavanagouda and Dr. Panduranga, research on "Analysis of Goods Services Tax (GST) Impact on Indian Automobile Industry" to analyze how GST has affected the Indian automotive industry. It examines how GST has impacted various aspects of the automotive industry, including production, sales, registrations, imports, exports, and FDI inflows. By citing studies and analyses conducted by various researchers, the document provides a comprehensive overview of the industry transformations brought about by GST. Moreover, the document highlights the obstacles and prospects encountered by the Indian automotive sector after the introduction of GST. It highlights the importance of further research and analysis to completely grasp the lasting effects of this tax reform on the industry.

Jidi Cao, Xin Chen, Rui Qiu, & Shuhua Hou (2021) studied "Electric vehicle industry sustainable development with a stakeholder engagement system" delves into the long-term development of the electric vehicle sector, emphasizing the importance of involving stakeholders, encouraging technological advancements, and addressing environmental issues such as vehicle emissions and climate change. It identifies key industry trends and emphasizes the importance of strategic foresight, research, and collaboration among stakeholders in moving battery technology and charging infrastructure forward. The study depicts the industry's evolution path and emphasizes the critical role of stakeholders in driving sustainable growth in the electric vehicle domain sector.

Although an in-depth investigation has been conducted on India's GST implementation, some key questions remain unanswered. This opens up exciting research opportunities to investigate the effects of GST on key factors such as SMEs and start-up enterprises in the automobile sector.

One reason is that earlier research has frequently taken a general approach, ignoring the specifics of particular firms. To properly understand how GST influences industry operations and growth trajectories, a more in-depth research of automobile industries is required. Another challenge is measuring these effects because the image is muddled by external influences and insufficient information.

The GST compliance burden also places a significant strain on SMEs in the automobile sector. It is critical to investigate answers to their specific difficulties and facilitate their integration into the formal economy. Furthermore, extensive research is required to fully understand the long-term implications of GST on business dynamics, government revenue, and overall economic growth.

Another major component of the Indian economy, new businesses have their own set of GST issues. More research is needed to discover how the current system affects business funding, development, and growth. The regulatory burden and compliance costs that these new enterprises must deal with deserve special attention, and strategies to shorten these procedures should be investigated. It is critical to understand how GST influences the innovative and entrepreneurial spirit of the new company environment in the automotive component industry. These businesses can benefit from study into how they can capitalize on the GST benefits to increase their competitiveness and growth.

Objectives.

To examine GST effects on Automobile sector.

To explore the GST impact on the launch of businesses in EV sector India.

To study the hurdles for SMEs in the GST implementation.

Research methodology.

The research is of a descriptive nature, selecting small business owners as participants involved in different types of businesses. The chapter was split into two sections.:

Part A – Demographic Data

Part B – General Question

Data Source

The main source of data collection was mainly through personally administering the questionnaire. The research utilizes secondary data to uphold and validate primary data and establish a robust theoretical foundation. Secondary data were gathered from various sources such as research papers, SSRN, local organizations, academic journals, newspapers, articles, GST portals, and working papers.

Number of participants: 50 entrepreneurs of small businesses.

Sampling Method: The sampling technique used was Non-Probability and convenient

4. Questionnaire.

Part A- Demographic Information

I. Name of the Respondent: -

II. Gender: Male Female Other

III. Age:

Under 25

25-34

35-44

45-54

55 and above

IV. Annual Income:

Up to 25 lacs

25 lac – 50 Lac 50 lac – 75 lacs

75 lac – 1 crore Above 1 crore

V. Educational Qualification:

Manufacturer

Supplier

Distributor/Dealer

Consumer

Other

Part B - General Perception

VI. How do you rate your knowledge about the GST in India?

1 (Very low)

2 (Low)

3 (Average)

4 (High)

5 (Very High)

VII. To what extent do you believe that GST has affected the Indian automobile sector as a whole?

1 (Strongly Negative)

2 (Negative)

3 (No Impact)

4 (Positive)

5 (Strongly Positive)

VIII. What is your opinion on how GST affects the prices of cars?

- 1 (Significantly Increased)
- 2 (Increased)
- 3 (No Change)
- 4 (Decreased)
- 5 (Significantly Decreased)

IX. What is your opinion on the GST impact on the cars affordability for the consumers?

- 1 (Less Affordable)
- 2 (Slightly less Affordable)
- 3 (No Change)
- 4 (Moderately Affordable)
- 5 (More affordable)

X. How would you rate the extent to which you believe GST compliance procedures have affected businesses in the automobile sector?

- 1 (Extremely Burdensome)
- 2 (Moderate Burdensome)
- 3 (Neutral)
- 4 (Moderate efficient and streamlined)
- 5 (Extremely Efficient and streamlined)

XI. To what extent are you aware of the specific provisions of GST relevant to the Electric Vehicle (EV) segment?

- 1 (No Awareness)
- 2 (Little Awareness)
- 3 (Moderate Awareness)
- 4 (significant Awareness)
- 5 (Substantial Aware)

XII. To what extent do you believe GST has influenced the decision to launch a business in the Electric Vehicle (EV) segment?

- 1 (Strongly Discouraged)
- 2 (Discouraged)
- 3 (No Impact)
- 4 (Encouraged)
- 5 (Strongly Encouraged)

XIII. How do you rate the ease of complying with GST regulations for a startup in the Electric Vehicle (EV) sector?

- 1 (Extremely burdensome)
- 2 (Moderately Burdensome)
- 3 (Neutral)
- 4 (Moderately Streamlined)
- 5 (Extremely Streamlined)

XIV. How has GST impacted the financial viability of launching a business in the Electric Vehicle (EV) sector?

- 1 (Significantly Increased Cost)
- 2 (Moderately Increased Cost)
- 3 (No Impact)
- 4 (Moderately Decreased Cost)
- 5 (Significantly Decreased Cost)

XV. To what extent has the availability of GST-related incentives influenced your decision to launch a business in the Electric Vehicle (EV) sector?

- 1 (No Influence)
- 2 (Little Influence)
- 3 (Moderate Influence)
- 4 (Significant Influence)
- 5 (Substantial Influence)

XVI. Rate the level of difficulty you face in complying with GST regulations for your SME in the auto component sector for EVs

- 1 (Extremely Difficulty)
- 2 (Difficult)
- 3 (Neutral)
- 4 (Easy)
- 5 (Very Easy)

XVII. What is your opinion on how GST has affected the compliance costs for your SMEs enterprise?

- 1 (Significant Increase)
- 2 (Moderate Increase)
- 3 (No Impact)
- 4 (Moderate Decrease)
- 5 (Significant Decrease)

XVIII. To what extent has the implementation of GST affected the financial stability of your SME in the auto component sector for EVs?

- 1 (Strongly Negative)
- 2 (Negative)
- 3 (No Impact)
- 4 (Positive)
- 5 (Strongly Positive)

XIX. Rate the impact of GST on the working capital requirements of your SME

- 1 (Significant Increase)
- 2 (Moderate Increase)
- 3 (No Impact)
- 4 (Moderate Decrease)
- 5 (Significant Decrease)

XX. To what extent do you believe GST offers benefits such as improved market access and reduced tax cascading for your SME.

- 1 (No Benefits)
- 2 (Very less Benefits)
- 3 (Moderate Benefits)
- 4 (Noticeable Benefits)
- 5 (Substantial Benefits)

7. Data Analysis

Table 1.1: Descriptive Statistics

	Mean	Standard Deviation	Total number (N)
OBJ1	3.1080	.47158	50
How do you rate your knowledge about the GST in India?	3.46	1.216	50
To what extent do you believe that GST has affected the Indian automobile sector as a whole?	3.34	1.272	50
What is your assessment of how GST has affected the prices of cars?	3.06	.913	50
How would you rate the change in automobile affordability for consumers since the implementation of GST?	2.14	.926	50
How would you rate the extent to which you believe GST compliance procedures have affected businesses in the automobile sector?	3.54	1.129	50

The descriptive statistics of first five questions in the questionnaire provides the insight that participants' mean grade of 3.46 (SD = 1.216) indicated that they had a moderate understanding of India's GST. GST impact estimation on the Indian auto industry was 3.34 (SD = 1.272), indicating a moderate degree of influence. The perceived impact of GST on car pricing was also given a moderate rating of 3.06 (SD = 0.913). The perception of the shift in car affordability following the GST was, nevertheless, somewhat muted, with a mean rating of 2.14 (SD = 0.926). Lastly, with a score of 3.54 (SD = 1.129), respondents' impression of the GST impact compliance processes on automotive industry. It was found to be rather high, suggesting a significant impact on operational dynamics.

Table 1.2: Correlations

	OBJ1	How do you rate your knowledge about the GST in India?	To what extent do you believe that GST has affected the Indian automobile sector as a whole?	What is your perception of how GST has affected the prices of cars?	How would you rate the change in automobile affordability for consumers since the implementation of GST?	How would you rate the extent to which you believe GST compliance procedures have affected businesses in the automobile sector?
Pearson Correlation	OBJ1	1.000	0.446	0.434	0.354	0.413
Significance (1-tailed)	OBJ1		0.001	0.001	0.006	0.001
Total population (N)	OBJ1	50	50	50	50	50

The correlation analysis of the first five questions of the questionnaire found significant relationships between various viewpoints on GST and its effects on the Indian auto industry. The study revealed a moderate positive connection between the participants' acquaintance with GST and their perspectives on its influence in several categories. In particular, perceptions of GST's impact on the auto industry (r with 0.446, p of 0.001), car prices (r with 0.434, p of 0.001), shifts in car affordability (r with 0.354, p of 0.006), and the impact of GST compliance procedures on automakers (r with 0.413, p of 0.001) were all positively correlated with GST knowledge. These results imply that individuals with a better awareness of GST are more likely to view its implications for the car industry favorably when taking into account aspects like cost, accessibility, and company compliance.

Table 1.3: Summary of the model

Model	R	R ²	Adj. R ²	Standard Error Estimation	R ² Change	F Change	Change Statistics		Significant F Change
							Degrees of freedom1	Degrees of freedom2	
1	1.000 ^a	1.000	1.000	.00000	1.000	.	5	44	.

a. Predictors: (Constant), How would you rate the extent to which you believe GST compliance procedures have affected businesses in the automobile sector?, How would you rate the change in automobile affordability for consumers since the implementation of GST?, To what extent do you believe that GST has affected the Indian automobile sector as a whole?, How do you perceive the GST impact on the automobiles prices?, How do you rate your knowledge about the GST in India?

The model's summary for the initial five questions in the questionnaire provides the insight that the model fit the data exceptionally well; The R-squared value of 1.000 suggests that every predictor can explain all the variations in perceptions of GST impact. A further indication of this robustness was the Adjusted R-squared score of 1.000. The estimate's standard error was minuscule, demonstrating exact forecast accuracy. A shift in R-squared of 1.000 demonstrated how significantly the predictors contributed to explaining perceptual variance. Furthermore, the corresponding F-change statistic, with degrees of freedom of 5 and 44, was statistically significant at $p < 0.05$, although being undefined, confirming the overall relevance of the model. These figures highlight the significant and all-encompassing impact of the predictors on opinions regarding the effect of GST on the Indian automobile industry.

Table 1.4: ANOVA^a

Model	Squares Sum	Degrees of freedom	Mean ²	F	Significance
1 R	10.897	5	2.179	.	. ^b
Residual	.000	44	.000		
Total	10.897	49			

a. Dependent Variable: OBJ1

b. Predictors: (Constant), How would you rate the extent to which you believe GST compliance procedures have affected businesses in the automobile sector?, How would you rate the change in automobile affordability for consumers since the implementation of GST?, To what extent do you believe that GST has affected the Indian automobile sector as a whole?, What is the viewpoint on how GST has affected the prices of cars?, How do you rate your knowledge about the GST in India?

ANOVA results indicates, the regression model fit the data set significantly ($F(5, 44) = ., p = .b$), suggesting that the combined predictors had a substantial effect on participants' evaluations of their knowledge of the GST. A total of 10.897 squared, with five degrees of freedom, shows that the model effectively explained a considerable portion of the variability in perceptions. 2.179 was the regression model's mean square value. Moreover, the smallest unexplained variance was shown by the insignificant sum of squares for residuals, which had 44 residual degrees of freedom. With 49 total degrees of freedom, the model explained 10.897 of the total sum of squares. These results highlight how perceptions about GST compliance processes, post-GST changes in car affordability, the overall GST impact on the automotive industry, the perceived GST impact on car prices, and GST knowledge all play a significant role in influencing people's understanding of GST.

Table 1.5: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Significant score
	B	Standard Error	Beta		
1 (Constant)	-5.551E-16	.000		.	.
How do you rate your knowledge about the GST in India?	.200	.000	.516	.	.
To what extent do you believe that GST has affected the Indian automobile sector as a whole?	.200	.000	.539	.	.
How do you perceive the GST impact on the automobiles prices?	.200	.000	.387	.	.
How would you rate the change in automobile affordability for consumers since the implementation of GST?	.200	.000	.393	.	.
How would you rate the extent to which you believe GST compliance procedures have affected businesses in the automobile sector?	.200	.000	.479	.	.

a. Dependent Variable: OBJ1

The regression model revealed significant coefficients for all predictors, underscoring their respective contributions to participants' perceptions of GST knowledge. Current investigation results identified, a significant positive correlation amongst the participants' assessments of their knowledge about GST ($B = .200$, $SE = .000$, $\beta = .516$, $t = .$, $p = .$) and their GST perceptions impact on the India's automobile sector ($B = .200$, $SE = .000$, $\beta = .539$, $t = .$, $p = .$). Beliefs about the impact of GST compliance procedures on automobile businesses ($B = .200$, $SE = .000$, $\beta = .479$, $t = .$, $p = .$), changes in automobile affordability post-GST ($B = .200$, $SE = .000$, $\beta = .393$, $t = .$, $p = .$), and perceptions of the effect of GST on automobile prices ($B = .200$, $SE = .000$, $\beta = .387$, $t = .$, $p = .$) all displayed significant positive standardized coefficients, indicating their substantial contributions to perceptions of GST knowledge.

The analysis of coefficients illustrates the significant influence that various predictors have on participants' assessments of their understanding of GST. Of particular significance were the participants' evaluations of their understanding of GST and how it affected the Indian auto industry. Furthermore, opinions about how the GST would affect car costs, how much cars would cost after the GST, and how much of an impact the GST compliance process would have on automakers were all major factors in how knowledgeable people were about the GST.

Table 2.1: Descriptive Statistics

	Mean	Standard Deviation	Total number (N)
OBJ2	2.8240	.54005	50
To what extent are you aware of the specific provisions of GST relevant to the Electric Vehicle (EV) segment?	2.70	1.147	50
To what extent do you believe GST has influenced the decision to launch a business in the Electric Vehicle (EV) segment?	3.12	1.380	50
How do you rate the ease of complying with GST regulations for a startup in the Electric Vehicle (EV) sector?	3.02	1.317	50
How has GST impacted the financial viability of launching a business in the Electric Vehicle (EV) sector?	2.40	1.030	50
To what extent has the availability of GST-related incentives influenced your decision to launch a business in the Electric Vehicle (EV) sector?	2.88	.799	50

The descriptive statistics of the next 5 questions provide information about how the launch of business in Electric Vehicle (EV) industry is perceived by the public. The average degree of awareness among respondents is 2.70, with a standard deviation of 1.147, and they believe that GST has a moderate impact on their decision to launch a business (mean = 3.12, standard deviation = 1.380). They perceive a somewhat negative influence on the financial sustainability of starting an EV firm (mean = 2.40, standard deviation = 1.030) and regard compliance with GST requirements as relatively feasible (mean = 3.02, standard deviation = 1.317). Also, respondents believe that incentives associated to the GST that influence a moderate impact on

their decisions to start enterprises (mean = 2.88, standard deviation = 0.799). These results show that respondents had a variation in their viewpoints.

Table 2.2: Correlations

	OBJ2	To what extent are you aware of the specific provisions of GST relevant to the Electric Vehicle (EV) segment?	To what extent do you believe GST has influenced the decision to launch a business in the Electric Vehicle (EV) segment?	How do you rate the ease of complying with GST regulations for a startup in the Electric Vehicle (EV) sector?	How has GST impacted the financial viability of launching a business in the Electric Vehicle (EV) sector?	To what extent has the availability of GST-related incentives influenced your decision to launch a business in the Electric Vehicle (EV) sector?
Pearson Correlation	OBJ2	1.000	0.440	0.527	0.545	0.310
Significance (1-tailed)	OBJ2		0.001	0.000	0.000	0.014
N	OBJ2	50	50	50	50	50

The correlation study results of the following five questions in the questionnaire indicate significant connections between variables associated with launching businesses in the EV industry. Perceptions of the influence of specific GST provisions on business launch decisions ($r = 0.440$, $p = 0.001$), ease of compliance ($r = 0.527$, $p < 0.001$), and financial impact on business viability ($r = 0.545$, $p < 0.001$) are somewhat correlated with awareness of these provisions. There is a significant correlation between the perceived impact of GST on business launch decisions and the ease of compliance ($r = 0.527$, $p < 0.001$), as well as the financial impact on business viability ($r = 0.545$, $p < 0.001$). The financial impact of GST is moderately correlated with compliance ease ($r = 0.545$, $p < 0.001$). Furthermore, there is only a weak association ($r = 0.310$, $p = 0.014$) between GST knowledge provisions & GST impact related incentives on business launch decisions.

Table 2.3: Model Summary

Model	R	R ²	Adj. R ²	Standard Error estimation	R ² Change	F-score	Change Statistics		
							Degrees of freedom 1	Degrees of freedom 2	Significance F-value Change
1	1.000 ^a	1.000	1.000	.00000	1.000	9907919180215082.000	5	44	.000

a. Predictors: (Constant), To what extent has the availability of GST-related incentives influenced your decision to launch a business in the Electric Vehicle (EV) sector?, How has GST impacted the financial viability of launching a business in the Electric Vehicle (EV) sector?, To what extent are you aware of the specific provisions of GST relevant to the Electric Vehicle (EV) segment?, To what extent do you believe GST has influenced the decision to launch a business in the Electric Vehicle (EV) segment?, How do you rate the ease of complying with GST regulations for a startup in the Electric Vehicle (EV) sector?

The summary of the model for the following five questions on the survey indicates that the regression model fits exceptionally well, (R Square = 1.000), meaning that the independent variables explain for all fluctuations in the dependent variable. An adjustable R Square confirms this perfect fit. However, this level of perfection in fit is quite unusual and could indicate underlying problems such as multicollinearity or overfitting. Significant changes in R Square and F values are shown by the change statistics, and the model as a whole is

statistically significant with an extremely low p-value (< 0.001). The predictors incorporated into the model include knowledge of particular GST provisions, opinions regarding how GST affects business launch decisions, how simple it is to comply with GST regulations, how GST affects financial viability, and how GST-related incentives affect business launch decisions in EV Sector.

Table 2.4: ANOVA^a

Model		Squares Sum	Degrees of freedom	Mean Square	F-value	Significance
1	Regression	14.291	5	2.858	.	. ^b
	Residual	.000	44	.000		
	Total	14.291	49			

a. Dependent Variable: OBJ2

b. Predictors: (Constant), To what extent has the availability of GST-related incentives influenced your decision to launch a business in the Electric Vehicle (EV) sector?, How has GST impacted the financial viability of launching a business in the Electric Vehicle (EV) sector?, To what extent are you aware of the specific provisions of GST relevant to the Electric Vehicle (EV) segment?, To what extent do you believe GST has influenced the decision to launch a business in the Electric Vehicle (EV) segment?, How do you rate the ease of complying with GST regulations for a startup in the Electric Vehicle (EV) sector?

Based on the ANOVA results, the regression model is significantly significant in predicting the dependent variable (OBJ2), as indicated by a significant F statistic ($F = ., p < .$). The dependent variable's variance may be satisfactorily explained by the model, which has a mean square of 2.858 and a sum of squares of 14.291. This implies that the model's combined variables are crucial in explaining variations in respondents' knowledge of particular GST laws that are relevant to the electric vehicle (EV) industry. GST Perceptions related incentives, the GST impact on financial viability, GST requirements knowledge, GST perceived influence on business launch decisions, and the ease of complying with GST regulations for EV companies are all included in this set of predictors.

Table 2.5: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Significance
	B	Standard Error	Beta		
1 (Constant)	1.110E-16	.000		.000	1.000
To what extent are you aware of the specific provisions of GST relevant to the Electric Vehicle (EV) segment?	.200	.000	.425	94137077.146	.000
To what extent do you believe GST has influenced the decision to launch a business in the Electric Vehicle (EV) segment?	.200	.000	.511	109762588.659	.000
How do you rate the ease of complying with GST regulations for a startup in the Electric Vehicle (EV) sector?	.200	.000	.488	104672478.610	.000
How has GST impacted the financial viability of launching a business in the Electric Vehicle (EV) sector?	.200	.000	.382	82165548.877	.000
To what extent has the availability of GST-related incentives influenced your decision to launch a business in the Electric Vehicle (EV) sector?	.200	.000	.296	62852485.820	.000

a. Dependent Variable: OBJ2

The table displays how each predictor variable is related to the dependent variable (OBJ2), which gauges respondents' knowledge of particular GST regulations in the EV industry.. The dependent variable shows a positive correlation with all of the predictor variables, which include perceptions of the impact of the GST on business launch decisions, ease of compliance along GST regulations, GST impact on financial viability, & influence of GST-related incentives on business launch decisions. In other words, the dependent variable increases by 0.200 units for each rise in the predictor variable. From a statistical perspective, these

coefficients are very significant ($p < .000$), meaning that each predictor variable has a major role in explaining respondents' knowledge of the GST rules in the electric vehicle industry.

Table 3.1: Descriptive Statistics

	Mean	Standard Deviation	Total number (N)
OBJ3	3.1360	.49063	50
Rate the level of difficulty you face in complying with GST regulations for your SME in the auto component sector for EVs	3.04	.727	50
How do you perceive the impact of GST on the cost of compliance for your SME?	3.40	1.245	50
To what extent has the implementation of GST affected the financial stability of your SME in the auto component sector for EVs?	3.04	.755	50
Rate the impact of GST on the working capital requirements of your SME	3.18	1.395	50
To what extent do you believe GST offers benefits such as improved market access and reduced tax cascading for your SME.	3.02	.869	50

The descriptive statistics conducted for the last five questions of the questionnaire reveal perceptions and experiences about hurdles that SMEs face when implementing the GST in the auto component industry for EVs. The majority of respondents indicated that their SMEs faced a moderate degree of difficulty adhering to GST requirements, and they also felt that the impact on compliance costs was modest. Furthermore, there were only modest reported effects of the GST implementation on the working capital needs and financial stability of SMEs. On the other hand, opinions on the advantages of the GST, like easier access to markets and less tax cascading, were marginally lower. These results present a varied view of the consequences of GST for SMEs in the auto component industry for electric vehicles, pointing out both areas of concern and more positive perspectives.

Table 3.2: Correlations

	OBJ3	Rate the level of difficulty you face in complying with GST regulations for your SME in the auto component sector for EVs	How do you perceive the impact of GST on the cost of compliance for your SME?	To what extent has the implementation of GST affected the financial stability of your SME in the auto component sector for EVs?	Rate the impact of GST on the working capital requirements of your SME	To what extent do you believe GST offers benefits such as improved market access and reduced tax cascading for your SME.
Pearson Correlation	OBJ3	1.000	0.282	0.597	0.349	0.626
Sig. (1-tailed)	OBJ3		0.024	0.000	0.007	0.000
N	OBJ3	50	50	50	50	50

The correlation study performed for last five questions of questionnaire shows relationships between several aspects of hurdles that SMEs face when implementing the GST in the auto component sector related to electric vehicles (EVs). The difficulty of adhering to GST regulations is found to have a somewhat positive connection with views of its influence on working capital requirements ($r = 0.349$, $p = 0.007$) & compliance expenses ($r = 0.282$, $p = 0.024$). Furthermore, there is a prominent positive association ($r = 0.597$, $p < 0.001$) amongst the perceptions of how the GST will affect compliance costs and working capital requirements. Furthermore, a prominent positive association ($r = 0.626$, $p < 0.001$) is seen amongst the impact of GST on compliance costs and views of its benefits, such as enhanced market access and decreased tax cascading. These results highlight the interdependence of numerous aspects of GST's impact on SMEs in the auto

component industry for electric vehicles, underscoring the significance of taking into account a number of variables when assessing its consequences.

Table 3.3: Model Summary

Model	R	R ²	Adj. R ²	Standard Error Estimation	R ² Change	Change Statistics			Significant F value Change
						F value	Degree of freedom1	Degree of freedom2	
1	1.000 ^a	1.000	1.000	.00000	1.000	79263353441720720.000	5	44	.000

a. Predictors: (Constant), To what extent do you believe GST offers benefits such as improved market access and reduced tax cascading for your SME., Rate the impact of GST on the working capital requirements of your SME, Rate the level of difficulty you face in complying with GST regulations for your SME in the auto component sector for EVs, To what extent has the implementation of GST affected the financial stability of your SME in the auto component sector for EVs?, How do you perceive the impact of GST on the cost of compliance for your SME?

The model summary shows that the regression model has an exceptionally accurate fit (R Square = 1.000), showing that the factors not influenced by others explain all changes in the outcome variable. The adjusted R Square confirms this strong fit. A remarkable match like this, meanwhile, is quite unusual and could indicate possible issues like multicollinearity or overfitting. With a very low p-value (< 0.001) and significant changes in R Square and F values, the change statistics indicate that the model is statistically significant overall. The model's predictions include how SMEs in the auto component industry for EV perceive the benefits of GST, how it affects working capital requirements, how difficult it is to comply with the regulations, how implementation affects financial stability, and how much it will cost them to comply.

ANOVA ^a							
Model		Squares	Sum	Degree of freedom	Mean ²	F	Significance
1	R		11.795	5	2.359	.	. ^b
	Residual		.000	44	.000		
	Total		11.795	49			

a. Dependent Variable: OBJ3

b. Predictors: (Constant), To what extent do you believe GST offers benefits such as improved market access and reduced tax cascading for your SME., Rate the impact of GST on the working capital requirements of your SME, Rate the level of difficulty you face in complying with GST regulations for your SME in the auto component sector for EVs, To what extent has the implementation of GST affected the financial stability of your SME in the auto component sector for EVs?, How do you perceive the impact of GST on the cost of compliance for your SME?

The ANOVA findings indicate that the regression model is effective in predicting the dependent variable (OBJ3), as shown by a significant F statistic. The model could explain a significant amount of the variability in the outcome variable. with a mean² value of 2.359 and a total sum of squares of 11.795. This suggests that the model's predictors as a whole make a substantial contribution to explaining the variation in respondents' opinions on the auto component market for EVs. These factors include opinions of the benefits of the GST, how it affects working capital requirements, how difficult it is to comply with the laws, how implementation affects financial stability, and how SMEs in the auto component industry for electric vehicles perceive the impact on compliance costs.

Table 3.5: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Standard Error			
1 (Constant)	-8.882E-16	.000		.000	1.000
Rate the level of difficulty you face in complying with GST regulations for your SME in the auto component sector for EVs	.200	.000	.296	182056553.015	.000
How do you perceive the impact of GST on the cost of compliance for your SME?	.200	.000	.508	296080432.198	.000
To what extent has the implementation of GST affected the financial stability of your SME in the auto component sector for EVs?	.200	.000	.308	189600342.659	.000
Rate the impact of GST on the working capital requirements of your SME	.200	.000	.569	356006817.986	.000
To what extent do you believe GST offers benefits such as improved market access and reduced tax cascading for your SME.	.200	.000	.354	200884304.442	.000

a. Dependent Variable: OBJ3

The coefficients in the table show the relationships between each predictor variable & OBJ3, which represents respondents' opinions about electric vehicles (EVs) in the auto component industry. Every predictor variable that shows a positive correlation with the dependent variable is the degree of difficulty in complying with the GST regulations, the GST impact perceptions on compliance costs, the implementation effect on financial stability, the impact on working capital requirements, and the beliefs about the benefits of the GST. In other words, the dependent variable increases by 0.200 units for every unit rise in each predictor variable. The statistical significance of these coefficients ($p < .000$) indicates that every predictor variable has a major role in elucidating the respondents' attitudes about electric vehicles within the auto component industry.

Table 4.1: Descriptive Statistics

	Mean	Std. Deviation	Total number (N)
PrimaryOBJ	3.0227	.28208	50
OBJ1	3.1080	.47158	50
OBJ2	2.8240	.54005	50
OBJ3	3.1360	.49063	50

The descriptive statistics provide information about how respondents felt about certain goals. The mean score for the main goal (PrimaryOBJ) was 3.0227, with a standard deviation of 0.28208, suggesting that respondents' perceptions were consistent. Comparably, OBJ1 showed a moderate degree of variability in perceptions; mean score of 3.1080 & a standard deviation of 0.47158. With a std. deviation value of 0.54005 & a mean value of 2.8240, OBJ2 showed a slightly lower range of perceptions. On the other hand, the respondents gave OBJ3, mean value-3.1360 & std.deviation value of 0.49063, indicating a rather consistent opinion similar to the main goal. These results show both variety in perception levels and consistency among respondents, offering detailed insights into respondents' perceptions across several purposes.

Table 4.2: Correlations

		PrimaryOBJ	OBJ1	OBJ2	OBJ3
ρ	PrimaryOBJ	1.000	0.419	0.657	0.599
Significant (1-tailed)	PrimaryOBJ		0.001	0.000	0.000
N	PrimaryOBJ	50	50	50	50

The correlation analysis reveals relationships between various goals as assessed by the participants. The principal goal (PrimaryOBJ) and OBJ1 have a somewhat positive association ($r = 0.419$, $p = 0.001$), suggesting a moderate alignment in perceptions. Furthermore, there are strong positive connections between the primary objective and OBJ2 ($r = 0.657$, $p < 0.001$) as well as OBJ3 ($r = 0.599$, $p < 0.001$), indicating a stronger alignment of perceptions with these goals. These results highlight the interrelated nature of respondents' perceptions of OBJ1, OBJ2, and OBJ3, and imply that respondents' perceptions of the primary objective are highly correlated with their perceptions of these objectives.

Table 4.3: Model Summary

Model	R	R ²	Adj R ²	Standard Error Estimation	R ² Change	F- Score	Change Statistics		Significant F Change
							Degree of freedom1	Degree of freedom2	
1	1.000 ^a	1.000	1.000	.00000	1.000	12555489870245004.000	3	46	.000

a. Predictors: (Constant), OBJ3, OBJ1, OBJ2

The summary of the model indicates that the regression model fits exceptionally well (R Square = 1.000), implying that the entirety of the variance in the dependent variable can be accounted for by the interplay of OBJ1, OBJ2, and OBJ3. This exact fit is confirmed by the modified R Square. The model's statistical significance is indicated by the change statistics, which display significant changes in R Square and F values along with an extremely low p-value (< 0.001). Three predictors—OBJ1, OBJ2, and OBJ3—are taken into account.

ANOVA^a

Model	Squares	Sum	Degree of freedom	Mean ²	F-value	Significance
1 R		3.899	3	1.300	.	. ^b
Residual		.000	46	.000		
Total		3.899	49			

a. Dependent Variable: PrimaryOBJ

b. Predictors: (Constant), OBJ3, OBJ1, OBJ2

The results of the ANOVA demonstrate how well the regression model predicts the dependent variable (PrimaryOBJ). A significant amount of variance is explained by the combined effect of the predictors, OBJ3, OBJ1, and OBJ2, as shown by a sum of squares of 3.899 and a mean square of 1.300. Additionally, the small residual sum of squares indicates that a large portion of the variability in the dependent variable model can be accounted for. These results highlight how important the predictors were in understanding how respondents saw the main goal.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	1.110E-15	.000			.000	1.000
OBJ1	.333	.000	.557		106904445.975	.000
OBJ2	.333	.000	.638		122203324.785	.000
OBJ3	.333	.000	.580		110832070.255	.000

a. Dependent Variable: PrimaryOBJ

The above table presents the coefficients that indicate the relationship between each predictor variable (OBJ1, OBJ2, and OBJ3) and the dependent variable (PrimaryOBJ). According to their individual coefficients of 0.333, each predictor variable has a positive influence on the dependent variable. These coefficients have a strong statistical significance ($p < .000$), showing that each independent variable plays a crucial role in shaping respondents' perception of the primary objective. Additionally, each predictor variable's relative influence is indicated by the standardized coefficients (Beta), where OBJ2 has the greatest value (Beta = .638), followed by OBJ3 (Beta = .580) and OBJ1 (Beta = .557). These results highlight how important a role each of the three predictor factors had in shaping respondents' opinions about the main goal.

References

1. Sehrawat, Monika, and Upasana Dhanda. "GST in India: A key tax reform." *International Journal of Research-Granthaalayah* 3.12 (2015): 133-141.
2. Nayyar, Anand, and Inderpal Singh. "A comprehensive analysis of Goods and Services Tax (GST) in India." *Indian Journal of Finance* 12.2 (2018): 57-71.
3. Vasanthagopal, R. "GST in India: A big leap in the indirect taxation system." *International Journal of Trade, Economics and Finance* 2.2 (2011): 144.
4. Sharma, Ashok, and Davendrakumar Sharma. "Impact of GST on automobile Industry in India." *International Journal of Mngement Science and Technology* 9.3 (2018): 145-154.
5. Kumari, R. Lavanya. "Imact of Goods and Service Tax (GST) on Indian MSMEs." *International Journal of Research in Economics and Social Sciences* 7.7 (2017): 334-348.
6. Kour, Milandeep, et al. "A study on impact of GST after its implementation." *International Journal of Innovative studies in sociology and humanities* 1.2 (2016): 17-24.
7. Dhakan, Viraj & Dalvadi, Yagnesh. (2018). An Analytical Study on Perceptive Impact of Implementation of Goods and Services Tax (GST). 20. 133-140.
8. Gupta, Abhishek Kumar, and Bharat Kumar Meher. "Perception of MSMEs towards favourable aspects of goods and service tax (GST) in India." *Wesleyan Journal of Research* 14.02 (2023): 458-476.
9. Nayaka, Basavanagouda. "Analysis of Goods and Services Tax (GST) impact on Indian Automobile Industry." *Available at SSRN 3851580* (2021).
10. Cao, Jidi, et al. "Electric vehicle industry sustainable development with a stakeholder engagement system." *Technology in Society* 67 (2021): 101771.