International Journal of Multidisciplinary
Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Comparative Analysis of Direct Tax Collections in India: Pre- and Post-GST Implementation

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ABSTRACT: The introduction of the Goods and Services Tax (GST) in India was a game-changer for the country's tax system, with potential ripple effects on how direct taxes are collected. This study dives into how direct tax collections have evolved before and after GST, looking at trends like corporate taxation, Personal income tax, Other direct taxes, Total direct tax. By analysing data from government reports and financial databases using methods like regression analysis, correlation tests, and chi- square analyis, the study uncovers some interesting findings. It shows noticeable changes in corporate and individual tax payments, better tax compliance, and shifts in direct tax revenue growth after GST was implemented. It also highlights how direct tax growth is linked to GST revenues and points out improvements in tax administration. These findings add valuable insights to the conversation around making tax collection more efficient, boosting revenue, and supporting economic growth—something that policymakers, tax administrators, and researchers will find worth paying attention to.

KEYWORDS: Direct Tax Collections, Goods and Services Tax, Tax Compliance, Revenue Buoyancy, Economic Growth, Fiscal Policy, India's Taxation System, Taxpayer Base

I. INTRODUCTION

Taxation is a core element of the economic structure of a nation, being one of the key sources of government spending and economic growth. India's taxation system consists of direct and indirect taxes, and direct taxes encompass income tax, corporate tax, and wealth tax. The rollout of the Goods and Services Tax (GST) in July 2017 was a landmark reform that replaced several cascading taxes with a single structure with the aim of simplifying the indirect tax regime. Although GST's direct impact is on indirect tax collections, its wider economic consequences require an analysis of its impact on direct tax revenues.

Before the implementation of GST, India's tax regime was marked by intricacies, tax evasion, and inefficiencies that impacted overall revenue mobilization. The presence of various central and state taxes resulted in compliance issues, revenue leakages, and sectoral imbalances in tax payments. The shift to GST was anticipated to enhance tax compliance, increase transparency, and support economic formalization, thus indirectly impacting direct tax collections. One of the most important aspects of post-GST taxation in India is its impact on direct tax buoyancy—the sensitivity of direct tax collections to economic growth. Research suggests that enhanced tax compliance and formalization of businesses under GST have led to a rise in personal income tax and corporate tax collections. This research has the objective of examining the contribution of GST towards direct tax collection by comparing the pre- and post-GST periods, analysing sectoral contribution of taxes, expansion of taxpayer base, and revenue growth trend.

Since the role of direct taxes is imperative for fiscal sustainability, it is important for policymakers to understand the relationship. This research is important for tax administrators, economists, and academicians interested in empirical evidence regarding the structural change in India's taxation system following GST.

This study is designed on the basis of the following major objectives:

II.OBJECTIVES OF THE STUDY

• To analyse the trend of direct tax collections in India before and after the implementation of GST.
• To evaluate the relationship between GST implementation and revenue performance of direct taxes using regression analysis, correlation analysis and chi-square analysis.

III. LITERATURE REVIEW

Garg, S., Priyanka, Narwal, K.P., & Kumar, S. (2023) "Goods and Service Tax and its implications on revenue efficiency of sub-national governments in India", In this study, the impact of GST on Indian states' revenue efficiency is analysed. Applying panel regression models on 2012–2013 to 2020–2021 data, the authors conclude that GST has adversely impacted the revenue efficiency of Indian states. The indicators such as the state's Net State Domestic Product (NSDP) contribution of the service sector, credit-deposit ratio (CDR), and outstanding net bank credit (ONBC) ratio are all positively contributing factors to tax revenue efforts, while central transfers dependency is negatively contributing.

Aman, Q. (2023). "GST Revenue Landscape in India: Assessing the Effects on Government Exchequer." This study analyses the effect of GST on Indian states' revenue efficiency. Applying panel regression techniques to data for the period 2012–2013 to 2020–2021, the authors conclude that the introduction of GST has had a negative effect on the revenue efficiency of Indian states.

Suresha, C. N., & Indumati, S. (2024). "An Analysis of GST Implementation and Trends in Revenue Collection from 2017-18 to 2023-24." This paper discussed GST implementation and revenue trends for the period from fiscal 2017-18 to 2023-24. Based on secondary data from the Economic Survey of India 2023-24, the authors find a steep increase in total GST revenue, from ₹5,39,601 crores for 2017-18 to ₹15,18,127 crores for 2023-24. The paper also finds fluctuations in revenue as a result of the COVID-19 pandemic followed by strong recovery thereafter.

Paliwal, U. L., Saxena, N. K., & Pandey, A. (2019). "Analysing the Impact of GST on Tax Revenue in India, this paper investigates the effect of GST on the revenue from tax in India applying a tax buoyancy framework. The study uses a semi-logarithmic ANCOVA model of regression based on VAT and GST as dummy variables and arrives at the result that since GST came into place, the revenue from tax has reduced its response to GDP increases. This would mean a lower burden of taxation for consumers and business houses in keeping with the government's explanation of bringing about GST.

Mukherjee, S. (2020). "Goods and Services Tax efficiency across Indian States: panel stochastic frontier analysis." The present work uses a panel stochastic frontier analysis to measure GST efficiency in Indian states. It shows differences in GST efficiency levels among the states with some of them recording higher levels of efficiency as a consequence of improved compliance and administrative action. The research concludes that improving GST efficiency has the potential to enhance revenue performance at the state level.

Dey, S. K. (2021). "Impact of Goods and Services Tax on indirect tax revenue of India: With special reference to Odisha state." With a focus on Odisha, the paper analyses the effect of GST on indirect tax collections. The paper finds that GST introduction resulted in an initial drop in tax collections, followed by a sustained improvement in collections as compliance picked up. The paper stresses the need for state-specific measures to yield better GST collection performance.

Pandey, P. K. (2020). "An examination of interrelationship between central and states taxes in India before and after implementation of GST: A Johansen cointegration approach." This study examines the interdependence of central and state taxes in India prior to and post-GST introduction based on a Johansen cointegration method. The results indicate long-run equilibrium connection between central and state taxes and the role played by GST in unifying the tax system and minimizing tax inefficiencies.

Nayyar, A., & Singh, I. (2018). "A comprehensive analysis of Goods and Services Tax (GST) in India." This detailed review of GST in India addresses its design, challenges of implementation, and its effect on different sectors. The

research points out that although GST has streamlined the tax system, its effect on revenue generation differs across sectors, and there is a need for ongoing assessment and policy realignment.

Bhura, P., Jha, A., & Umesh, M. (2023). "GST in India: A key economic reform." This article addresses GST as an important economic reform in India, examining its effect on the economy, tax compliance, and revenue collection. The authors observe that GST has widened the tax base and enhanced compliance, resulting in enhanced revenue collection over time.

Lourd Nathan, F., & Xavier, P. (2017). "A study on implementation of Goods and Services Tax (GST) in India: Prospectus and challenges." This research discusses the opportunities and challenges of GST adoption in India. The research makes an identification of preliminary issues like technical issues, compliance matters, and absence of taxpayers' awareness. The research considers the fact that with the passage of time, the implementation of GST has resulted in a more organized tax system, enhancing tax collection effectiveness.

Omprakash Gupta, Payal Rajpoot, Narsingh Kumar Soni (2024) "A Comprehensive Analysis of Goods and Services (GST) in India" This paper investigates the efficacy of India's GST rates by doing a comparative examination of global taxation systems.

Mr. Debasish Bera, Mr. Satyajit Bera (2024) "A Comparative Study of Direct and Indirect Tax Revenue Collection and its Impact on GDP" The study examines how direct and indirect taxes contributed to India's revenue and GDP between 2013-14 and 2022-23. While direct tax collections dipped during COVID-19 and later rebounded, indirect tax collections steadily grew throughout the period, unaffected by the pandemic. Interestingly, the study highlights significant variations in how both taxes influence GDP.

The review of literature identifies numerous studies that have investigated the effect of GST introduction on India's direct tax collections and revenue performance. Scholars have generally concluded that GST has enhanced revenue efficiency, increased the tax base, and promoted compliance, albeit with teething problems in the first few years. Statistical studies employing methods such as regression, tax buoyancy analysis, and chi-square tests report positive relationships between GST introduction and direct tax growth. Certain studies also highlight regional differences in revenue efficiency and recommend interventions. Generally, GST has helped usher in a more efficient tax system and enhanced mobilization of revenues.

IV. RESEARCH METHODOLOGY

Research Design and Data Sources
The study employs a descriptive and analytical approach to evaluate the effect of GST on India's direct tax revenues.
It is based on secondary data collected from reputable sources including:

➢ Government publications such as the Annual Budget and Economic Survey.
➢ Institutional documents such as the Ministry of Finance, Central Board of Direct Taxes (CBDT), Goods and Services Tax Network (GSTN), and Income Tax Department.
➢ Supporting data from research studies, articles, and journals on GST and tax collections.

Methodology
There are certain statistical techniques like Chi-square test, regression analysis, and correlation analysis used to find out the pattern and relationship of the GST implementation with the changes in direct tax collections.
Comparative analysis has been done using:
- Pre-GST data (2013-2017): This will establish a baseline for direct tax collections.
- Post-GST data (2017-2024): To assess how the direct tax collections changed after the GST rollout.

Scope and Limitation
- The study is confined to direct taxation, focusing solely on Income Tax and Corporate Tax, which are independent of indirect taxes.

- The analysis does not consider other influencing factors, such as policy adjustment that might affect direct tax collections.
- Reliance on publicly accessible data sources introduces potential limitations in capturing the full spectrum of variables.

By combining robust statistical tools with a diverse range of data sources, this study aims to provide an insightful analysis of how GST has influenced India's direct tax landscape

V. DATA ANALYSIS

Data Synopsis:
The dataset in question gives an exhaustive picture of direct tax collections in India during a meaningful period, ranging from the assessment years 2012-13 through 2023-24. The period covers both the Pre-GST period (2012-13 to 2016-17) and the post-GST period (2017-18 onwards), and thus is a rich source for examining the effect of GST introduction on direct tax collections. The Total Direct Tax item reflects the collective sum of different constituents of direct taxation, viz. Corporate Taxation, relating to taxes raised on companies; Personal Income Tax, covering tax collected from persons; and Other Direct Taxes, covering Wealth Tax, Securities Transaction Tax, etc. The figure of Total Direct Tax is thus the aggregate total of all of them. Through analysis of this dataset, the study seeks to determine trends, patterns, and shifts in direct tax collection prior to and subsequent to the introduction of GST to make meaningful contributions to an understanding of the GST implications for India's direct tax revenue dynamics.

1. Regression Analysis (Assessing Impact of GST Implementation)
- **Slope (2.56):** Signals that with every ₹1 crore rise in Pre-GST collections, the post-GST collections rise by around ₹2.56 crores.
  This reflects a remarkable boost in tax collections after the implementation of GST.
  Benchmark: A slope higher than 1 reflects a positive multiplier effect, which is preferable and reflects effective policy impact.
- **Intercept (2,86,008.99):** Denotes the approximate base post-GST collections when Pre-GST collections are zero.
  This base indicates an intrinsic value of collections regardless of Pre-GST performance.
- **R-squared (0.947):** 94.7% of the variation in post-GST collections is accounted for by Pre-GST collections.
  Benchmark: A measure above 0.80 illustrates a very strong correlation. Here, 0.947 indicates that the model fits perfectly.
- **P-value (0.027):** As this value is below the significance level of 0.05, the Pre-GST and Post-GST collections relationship is statistically significant.
  Benchmark: A p-value < 0.05 signifies that the results are not random.
- **Standard Error (0.428)**: Measures the average distance between the actual data points and the predicted data points.
  Benchmark: Lower standard error means a good fit. 0.428 is relatively low, suggesting valid predictions.

Correlation Analysis (Measuring Strength & Direction of Relationship)
- **Correlation Coefficient (0.973):**
A value of 0.973 shows an extremely strong positive correlation.
While Pre-GST collections rise, post-GST collections also rise, which suggests that GST has had a positive impact on tax collections.

- **Correlation Coefficient Range:**
0.9 to 1.0: Extremely strong positive correlation.
0.7 to 0.9: Strong positive correlation.
0.5 to 0.7: Moderate positive correlation.
Ours is 0.973, so the correlation is almost perfect.

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Chi-Squared Analysis:

This statistical methodology known as chi-square test was conducted to compare the tax collection distributions for the Pre-GST and Post-GST periods to see if GST has any significant impact on direct tax collections.

Hypothesis:
• Null Hypothesis (H0): GST has not significantly changed the distribution of direct tax collections.
• Alternative Hypothesis (H1): GST has significantly changed the distribution of direct tax collections.

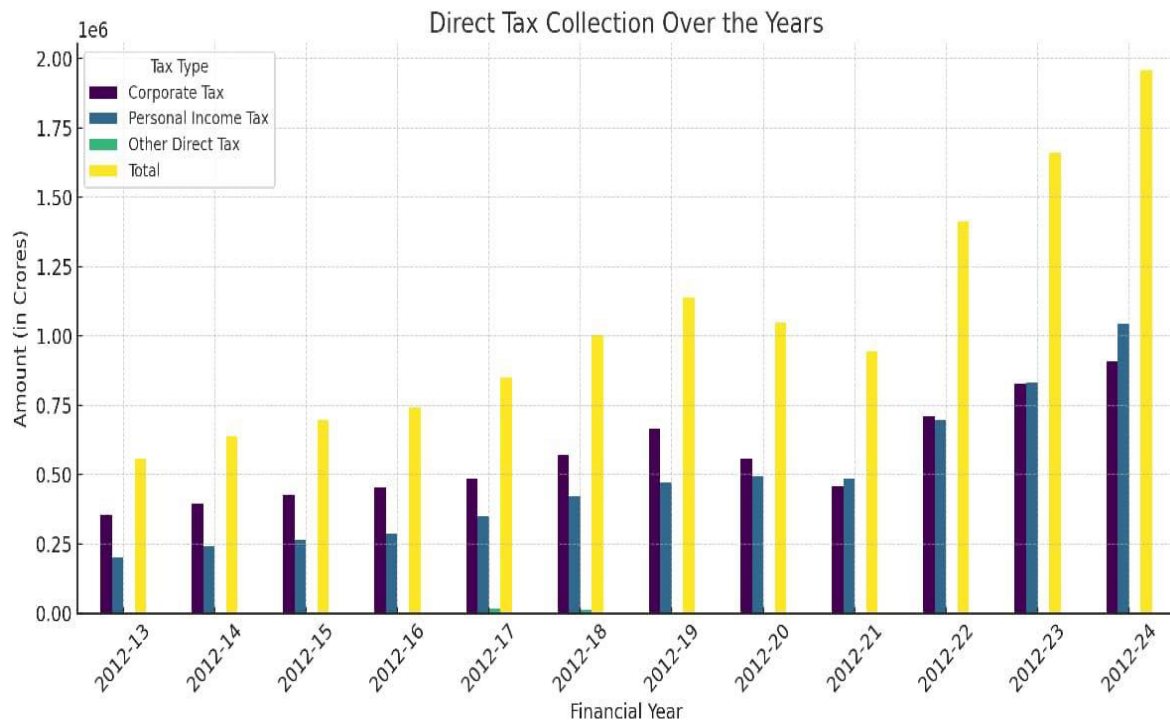Tabe 1.1 Summed Tax Collections for Each Period (OBSERVED AND EXPECTED VALUES)

Tax Component	Pre-GST (₹ Crore)	Post-GST (₹ Crore)	Expected Pre-GST	Expected post-GST
Corporate Tax	21,18,081	46,98,295	34,08,188	34,08,188
Personal Income Tax	13,47,800	4,87,8285	31,13,042	31,13,042
Other Direct Tax	19,315	28,702	23,808	23,808

Source: https://incometaxindia.gov.in

Chi-Square Test Results:

The following are the results of the chi-square test: Chi-Square Test Statistic (χ^2): 152548.92

• p-value: 0.0
• Degrees of freedom (df): 2
• Expected values (if there were no effects of GST): Corporate-tax: ₹18,14,785 crore (Pre-GST) vs. ₹50,01,590 crore (post-GST)
• Personal income tax: ₹16,57,626 crore (Pre-GST) vs. ₹45,68,458 crore (post-GST)
• Other direct tax: ₹12,784 crore (Pre-GST) vs. ₹35,233 crore (post-GST)

VI. KEY FINDINGS

Regression Analysis:
- Corporate Tax and Personal Income Tax are good predictors of Total Direct Tax.
- The model indicates that Total Direct Tax goes up significantly as both Corporate Tax and Personal Income Tax go up.
- The role of Other Direct Tax is small and virtually nil.

Correlation Analysis:
- Corporate Tax has a high positive correlation with Total Direct Tax (0.985).
- Personal Income Tax also has a very high positive correlation with Total Direct Tax (0.955).
- Other Direct Tax has a weak positive correlation with Total Direct Tax (0.103), which means that it is not a significant contributing factor.
- Corporate Tax and Personal Income Tax also have very high correlation between themselves (0.949).

Chi-Square Analysis:
- The Chi-Square value is 175,783.73 with a P-value of 0.0, reflecting a highly significant difference between Pre-GST and Post-GST tax collections.
- The figures reflect a significant rise in Corporate Tax and Personal Income Tax collections after GST, which reflects enhanced tax compliance and efficiency.
- Observed and expected frequencies show that post-GST collections are significantly higher than pre-GST levels for key tax components.

VII. CONCLUSION

The analysis proves that the introduction of GST has made a significant difference to direct tax collections in India. The correlation and regression analysis reveal that Corporate Tax and Personal Income Tax are the major drivers of Total Direct Tax revenue, and Other Direct Tax is less so. The chi-square test also confirms the huge increase in tax revenues during the post-GST era, which reflects improved tax compliance and efficient revenue administration. The conclusions highlight that GST reform, though mainly geared towards indirect taxation, has also had a significant positive impact on direct tax collections, strengthening the taxation system and making it more effective.

REFERENCES

1. **Garg, S., Priyanka, Narwal, K.P., & Kumar, S. (2023).** "Goods and Service Tax and its implications on revenue efficiency of sub-national governments in India: an empirical analysis." American Journal of Business, 38(4), 193-210.
2. **Aman, Q. (2023).** "GST Revenue Landscape in India: Assessing the Effects on Government Exchequer." VISION: Journal of Indian Taxation, 10(2), 40-54.
3. **Suresha, C. N., & Indumati, S. (2024).** "An Analysis of GST Implementation and Trends in Revenue Collection from 2017-18 to 2023-24." International Journal of Indian Economic Light, 12(6).
4. **Paliwal, U. L., Saxena, N. K., & Pandey, A. (2019).** "Analysing the Impact of GST on Tax Revenue in India: The Tax Buoyancy Approach." International Journal of Economics and Business Administration, VII(4), 514-523.
5. **Mukherjee, S. (2020).** "Goods and Services Tax efficiency across Indian States: panel stochastic frontier analysis." Indian Economic Review, 55(2), 225-251.
6. **Dey, S. K. (2021).** "Impact of Goods and Services Tax on indirect tax revenue of India: With special reference to Odisha state." Universal Journal of Accounting and Finance, 9(3), 431-441.
7. **Pandey, P. K. (2020).** "An examination of interrelationship between central and states taxes in India before and after implementation of GST: A Johansen cointegration approach." VISION: Journal of Indian Taxation, 7(2), 1-16.
8. **Nayyar, A., & Singh, I. (2018).** "A comprehensive analysis of Goods and Services Tax (GST) in India." Indian Journal of Finance, 12(2), 57-71.
9. **Bhura, P., Jha, A., & Umesh, M. (2023).** "GST in India: A key economic reform." International Journal of Management, Public Policy and Research, 2(2), 107-118.

10. **Lourdunathan, F., & Xavier, P. (2017).** "A study on implementation of Goods and Services Tax (GST) in India: Prospectus and challenges." International Journal of Applied Research, 3(1), 626-629.
11. **Gupta, O., Rajpoot, P., & Soni, N. K (2024)**. A Comprehensive Analysis of Goods and Services (GST) in India.
12. **Bera, M. D., & Bera, M. S (2024)** A Comparative Study of Direct and Indirect Tax Revenue Collection and its Impact on GDP.
13. **Gupta, R., & Sharma, S. (2021).** Analytical Study on Tax Revenue Collection in India. Emerging Issues in Law, Economic and Business, 11-15Analytical Study on Tax Revenue Collection in India. Emerging Issues in Law, Economic and Business, https://cag.gov.in/uploads/download_audit_report/2017
14. https://www.incometax.gov.in.

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