

# A Comparative Study on Contribution of Indirect Tax and GST towards GDP of India: An Empirical Analysis

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## Abstract

India has adopted a dual GST which is imposed concurrently by the Centre and States, i.e., Centre and States simultaneously collect tax on goods and services. GST extends to whole of India including the State of Jammu and Kashmir. The Implementation of the Goods and Services Tax (GST) in India was a historical move, as it marked a significant indirect tax reform in the country. The amalgamation of large number of taxes (levied at the central and state level) into single tax is expected to have big advantages.

The entire process of GST (from registration to filling returns) made online, and it is super simple. This has been made beneficial for start-ups especially, as they do not have to run from pillar to post to get different registrations such as VAT, excise, and service tax. Earlier, there was Central Excise duty and service tax, each of which had their own returns and compliances. This paper is intended to analyze and identify that is there any significant difference between GST Revenue that is collected by the Government post implementation of GST towards GDP when compared to indirect tax revenue.

Indirect Tax Revenue implies - The Amount of Rupees in Crores that is collected by Central Board of Indirect Taxes, Government of India, by way of Central Excise and Service Tax pre-implementation of GST.

GST implies - The Amount of rupees in Crores that is collected by Central Board of Indirect Taxes, Government of India, by way of Goods and Services Tax which is introduced during 2017, by the Government of India.

**Keywords:** Indirect Tax, GST, GDP Contribution, Pre and Post GST Implementation

## Introduction

Indian economy has finally undertaken the much-needed fiscal reform in the form of implementation of multistage comprehensive value added tax (VAT) encompassing both goods and services (GST). At the

time of independence, the Indian economy inherited a tax structure regressive in nature with an anti-trade bias both domestic and international. The area of public finance in general and taxation, in particular, has attracted prime attention over time especially from policymakers. However, the case for the micro-level concepts of taxation like compliance, cascading and targeting of taxation policies is not so obvious.

If revenue protection is the objective, maintaining tax revenue at least at the level (as percentage of GDP) prevalent at the time of introduction of tax reform will be the second-best approach in absence of reliable estimate of the tax base. Since the tax base taxes like GST / Indirect Tax (Central Excise and Service Tax) depends on domestic consumption expenditures on goods and services, it is expected that consumption expenditure will grow at least at the level of overall economic at least at the level of overall economic growth. In other words, given the level of tax compliance, annual growth in tax revenue at least to be equal to the growth in GDP. However, income inequality may dampen the overall consumption growth and for a developing country like India and achieving income equality may increase tax base as well as tax revenue. If growth rate in tax revenue falls below the growth rate of GDP, the revenue protection objective cannot be met. On the other hand, if growth rate in tax revenue exceeds the growth rate of GDP, the objective of revenue protection will be met easily. Since the demand for public expenditures is growing, it is desirable for a developing country to take all measures to achieve growth in tax collection higher than the growth in GDP.

In this paper we try to analyze the revenue implications of GST after its implementation and its contribution towards Gross Domestic Product and to compare and find out is there any significance difference with the revenue implications of Indirect Tax Revenue (Central Excise and Service Tax) towards GDP pre-implementation of GST.

### **Literature Review**

Seema Pandit (September 2017), opined that Goods and Services Tax is clearly a long-term blueprint which would lead in the progress and development of the country like India. Ethisham Ahmed and Satya Poddar (2009), studied, “Goods and Services Tax – A way forward” and concluded that the implementation of GST in India helps in removing economic distortion by current indirect tax system and expected to encourage unbiased tax structure. Nitin Kumar (2014) concluded that GST introduction will provide simpler and transparent tax system which will elevate the output and productivity of economy of India. Lourduathan F. and Xavier P. (2016) analysed in their study that GST implementation requires concentrated efforts of all stakeholders especially trade and industry. It is therefore necessary on the part of the Government to educate, conduct proper training, seminars and workshops to increase the compliance level of tax payers. Manoranjan Kumar, Akhilesh Barve, Devendra K. Yadav (14 January 2019), studied and concluded that if a country like India is implementing GST, it needs to have strong political will power and proper functioning of administration. Complexities in administration and lack of clarity of GST provisions will lead to lack of preparedness among clients. Krishna Murari and Smriti Chetti in their study “Perceived impacts of Goods and Services Taxes in Sikkim”, concluded in their study that the manufacturing sector significantly impact in terms of ease of doing business, compliance and procedural impact business expansions and operational cost, whereas service sector do not impact significantly. Nirmala Devi, in her study, “3 Years of GST in India - A progress Report after 36 Months of Implementation” suggested that the ministry of finance, as well as the GST Council, needs to tackle issues and forms linked GST return filing and the consequences

which is faced by the tax payers alike. Arindam Neral, Niharika Tirkey (2019) in their study “Impact of GST on Indian Economy” concluded that once GST is implemented, the projected taxation system holds great undertake in terms of sustaining growth for Indian Economy. Shefali Dani (2016) stated that the proposed GST is a weak attempt to rationalize the indirect tax structure. According to Dani, the Government of India should study the GST regimen set up by various other countries and their dropouts before its application. Sue Yong, Karen Lo, Brett Freudenber and Adrian Sawyer (2019) in their study “Tax Compliance in the New Millenium: Understanding the Variables” which have significant impact on the tax compliance, tax evasion and tax morale behaviour of the taxpayers over the period of twenty years literature has been reviewed in which the researchers have contributed the 20 variables that have a significant impact on the tax compliance behaviour of the tax payers. Anju Singh, (January 2021) in the study titled “A Comparative Study of GST and VAT in Three Consecutive Terms: With Special Reference to Pre and Post GST Implementation” highlighted that a single type of tax called GST or goods & services tax is applied throughout the country and is substituted for a variety of other indirect taxes, such as VAT, services tax etc. G.H. Bharate (May 2017) in their study concluded that the overture of Goods and Services Tax (GST) would be a very momentous step in the field of indirect tax. Goods and Services Tax (GST) has been acknowledged as one of the most imperative tax reforms post-independences. It is a tax trigger, which will lead to business transformation for the industry. The study conducted by Shilpa R. Kulkarni and Sudhindra Apsingekar (2021) focuses on understanding the effect of GST post implementation on key economic parameters and evaluate the effectiveness, benefits and drawbacks of GST. the researchers concluded that GST will include decrease in commodity prices in long run & increased consumption of goods which will also boost economic growth and GDP for the country.

### Objectives

1. To study the contribution of Indirect Tax (Central Excise and Service Tax) towards GDP.
2. To study the contribution of Goods and Services Tax towards GDP.
3. To compare the contribution of Indirect Tax (Central Excise and Service Tax) and GST towards GDP.
4. To identify whether there is a significant difference between, Indirect Tax and GST contribution towards GDP.

### Hypothesis

1. **Null Hypothesis:** There is no significant difference between Indirect Tax and GST collections Contribution towards GDP.
2. **Alternate Hypothesis:** There is significant difference between Indirect Tax and GST collections contribution towards GDP.
3. **Null Hypothesis:** There is no significant difference between GST collections towards GDP of India.
4. **Alternate Hypothesis:** There is a significant difference between GST collections towards GDP of India.

### Research Methodology

Framework for the research is divided into three parts. First part consists of indirect tax collected before the implementation of GST, second part consist GST tax collected from the year 2017, and third part consists of GDP from 2013-14 to 2029-21. After recording the data, it is framed into a model where respective year’s indirect tax or GST is divided with respective year’s GDP and a ratio is measured. This

is done in order to understand the contribution of respective taxes on GDP and to also understand the impact of each of these taxes one by one.

### Framework to Study Contribution

Year	Indirect Tax (Central Excise and Service Tax)	GDP	Ratio	Percentage
2013-14	$X_1$	$Y_1$	$X_1 \div Y_1$	$(X_1 \div Y_1) \times 100$
2014-15	$X_2$	$Y_2$	$X_2 \div Y_2$	$(X_2 \div Y_2) \times 100$
2015-16	$X_3$	$Y_3$	$X_3 \div Y_3$	$(X_3 \div Y_3) \times 100$
2016-17	$X_4$	$Y_4$	$X_4 \div Y_4$	$(X_4 \div Y_4) \times 100$

Year	GST	GDP	Ratio	Percentage
2017-18	$X_5$	$Y_5$	$X_5 \div Y_5$	$(X_5 \div Y_5) \times 100$
2018-19	$X_6$	$Y_6$	$X_6 \div Y_6$	$(X_6 \div Y_6) \times 100$
2019-20	$X_7$	$Y_7$	$X_7 \div Y_7$	$(X_7 \div Y_7) \times 100$
2020-21	$X_8$	$Y_8$	$X_8 \div Y_8$	$(X_8 \div Y_8) \times 100$

Year	Indirect Tax (Central Excise and Service Tax)	GDP	Ratio
2013-14	$X_1$	$Y_1$	$X_1 \div Y_1$
2014-15	$X_2$	$Y_2$	$X_2 \div Y_2$
2015-16	$X_3$	$Y_3$	$X_3 \div Y_3$
2016-17	$X_4$	$Y_4$	$X_4 \div Y_4$
Year	GST	GDP	Ratio
2017-18	$X_5$	$Y_5$	$X_5 \div Y_5$
2018-19	$X_6$	$Y_6$	$X_6 \div Y_6$
2019-20	$X_7$	$Y_7$	$X_7 \div Y_7$
2020-21	$X_8$	$Y_8$	$X_8 \div Y_8$

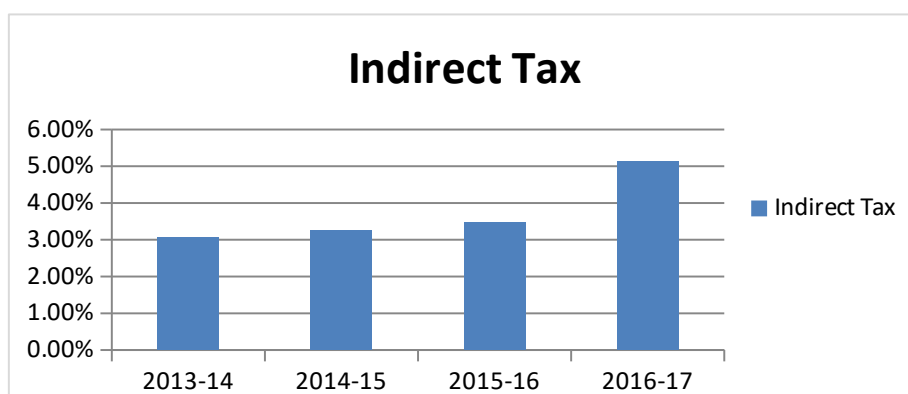
### Data Collection

Under the first parameter, indirect tax data is collected in rupees in crores. Under GST, the value of tax data is collected for the period of 2017-18 to 2020-21. GDP data is collected for the period of 2013-14 to 2020-21 in crores. After collection, the data is arranged according to the framework.

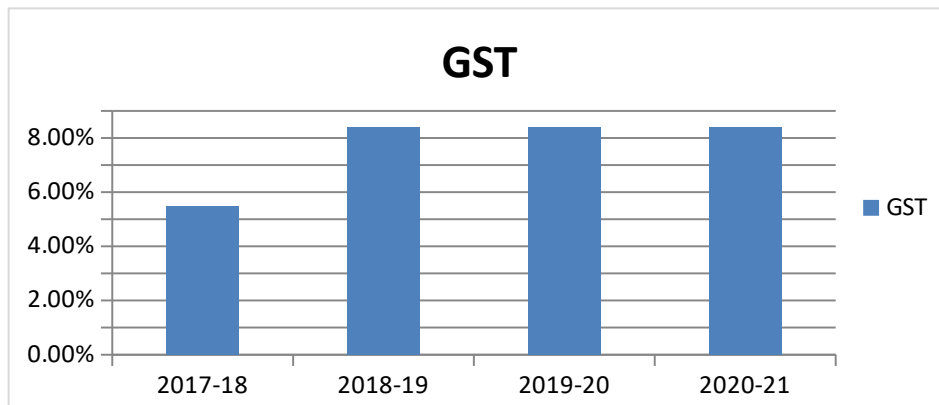
Year	Indirect Tax (Central Excise and Service Tax)	GDP	Ratio
2013-14	299,496	9,801,370	0.030556545
2014-15	341,367	10,527,674	0.032425681
2015-16	393,395	11,369,493	0.034600927
2016-17	630,687	12,308,193	0.051241234
Year	GST	GDP	Ratio
2017-18	719,078	13,144,582	0.054705277
2018-19	1,177,370	14,003,316	0.084077943
2019-20	1,222,117	14,569,268	0.083883212
2020-21	1,136,803.00	13,512,740	0.084128238

### Data Analysis

Year	Indirect tax (Central Excise and Service Tax)	GDP	Ratio	Percentage
2013-14	299,496	9,801,370	0.030556545	3.0556545%
2014-15	341,367	10,527,674	0.032425681	3.2425681%
2015-16	393,395	11,369,493	0.034600927	3.4600927%
2016-17	630,687	12,308,193	0.051241234	5.1241234%



Year	GST	GDP	Ratio	Percentage
2017-18	719,078	13,144,582	0.054705277	5.4705277%
2018-19	1,177,370	14,003,316	0.084077943	8.4077943%
2019-20	1,222,117	14,569,268	0.083883212	8.3883212%
2020-21	1,136,803.00	13,512,740	0.084128238	8.4128238%



Replication	Before GST	After GST	$Y_j$
1	0.030556545	0.054705277	0.085261822
2	0.032425681	0.084077943	0.116503624
3	0.034600927	0.083883212	0.118484139
4	0.051241234	0.084128238	0.135369472
$Y_i$	0.148824387	0.306794669	0.455619057
$\Sigma Y_i^2$	0.022148698	0.094122969	

### Calculation of Correction Factor

$$C.F. = \frac{Y^2}{Tr}$$

$$C.F. = \frac{0.455619057 \times 0.455619057}{4 \times 2}$$

$$C.F. = 0.2075887251 \div 8$$

$$C.F. = 0.0259485906$$

### Calculation of Total Sum of Squares

$$\begin{aligned} T.S.S. &= (0.030556545^2 + 0.032425681^2 + 0.034600927^2 + 0.051241234^2 + 0.054705277^2 + \\ &\quad 0.084077943^2 + 0.083883212^2 + 0.084128238^2) - 0.0259485906 \\ &= (0.0093370244 + 0.0010514248 + 0.0011972241 + 0.0026256641 + 0.00299266733 + 0.0070691005 \\ &\quad + 0.0070363933 + 0.0070775604) - 0.0259485906 \\ &= 0.0383870589 - 0.0259485906 \\ &= 0.0124384683 \end{aligned}$$

### Calculation of Replication Sum of Squares

$$\text{Rep S.S.} = \frac{[\sum Y_i^2] - CF}{T}$$

$$\begin{aligned} &= [ (0.085261822^2 + 0.116503624^2 + 0.118484139^2 + 0.135369472^2) \div 2 ] - 0.0259485906 \\ &= [ 0.0072695783 + 0.0135730944 + 0.0140384912 + 0.0183248939 ) \div 2 ] - 0.0259485906 \\ &= 0.0532060578 \div 2 - 0.0259485906 \\ &= 0.026603029 - 0.0259485906 \end{aligned}$$

Rep S.S. = 0.0006544

### Calculation of Treatment Sum of Squares

$$\text{Tr S.S.} = \frac{\left[ \sum Y_i^2 \right] - CF}{r}$$

$$= [ ( 0.148824387^2 + 0.306794669^2 ) \div 4 ] - 0.0259485906$$

$$= [ 0.022148698 + 0.094122969 \div 4 ] - 0.0259485906$$

$$= 0.029067917 - 0.0259485906$$

$$\text{Tr S.S.} = 0.003119326$$

### Calculation of Error Sum of Squares

$$\text{Error S.S.} = \text{Total S.S.} - \text{Rep. S.S.} - \text{Tr S.S.}$$

$$= 0.0124384683 - 0.0006544 - 0.003119326$$

$$\text{Error S.S.} = 0.008664742$$

**ANOVA Table**

SOV	Df	SS	MS	F <sub>cal</sub>
<b>Rep</b>	$r - 1 = 4 - 1 = 3$	0.0006544	0.00021813	0.075523319
<b>Trt</b>	$t - 1 = 2 - 1 = 1$	0.003119326	0.003119326	1.080005623
<b>Error</b>	$(r - 1)(t - 1) = 3$	0.008664742	0.002888247	
<b>Total</b>	$\text{Tr} - 1 = 7$	0.0124384683	0.001776924	

### Comparison with Table F – Distribution Values

Replication	Treatment
$F_{0.05, 3,3} = 9.2766$	$F_{0.05, 1,3} = 10.1280$
$F_{0.01, 3,3} = 5.3907$	$F_{0.01, 1,3} = 5.53832$

**Replication:** Since  $F_{\text{cal}} (0.075523319) < F_{\text{tab}}$  for all 95% and 99% levels of confidence, null hypothesis is not rejected.

**Treatment:** Since  $F_{\text{cal}} (1.080005623) < F_{\text{tab}}$  for all 95% and 99% levels of confidence, the null hypothesis is not rejected.

### Interpretation

From the above analysis, the inference that can be drawn is that we fail to reject null hypothesis, since the F table value ( $F_{0.05, 3,3} = 9.2766$ ) is more than the F calculated value (0.075523319). This means that there is no significant difference between Indirect Tax (Pre GST – Central Excise and Service Tax) and GST Collections towards GDP. When it comes to treatment of the hypothesis, GST collection does not show any significant difference towards the contribution of GST, hence we fail to reject the null hypothesis, as F table value ( $F_{0.05, 1,3} = 10.1280$ ) is more than F calculated value (1.080005623).

## Findings

From this analysis it is clear that when we first compare the contribution of indirect tax collection and GST revenue collection towards GDP, it has been found that there is no significant difference between indirect tax revenue collection (collection of Central Excise and Service Tax revenue pre-implementation of GST) and GST revenue Collection towards GDP. The value appears to be same when we compare the ratio of both the revenue collection. And in case of second hypothesis, which was framed to analyse is there any significant difference in GST revenue contribution towards GDP, it is clear from the above analysis that, there is no significant difference, hence in this case also null hypothesis is accepted.

## Suggestion and Conclusion

From this study it can be suggested and concluded that, when it comes to revenue collection perspective, whether it is Indirect tax which includes central excise and service tax, or newly introduced Goods and Services Tax, the significant contribution is same, and there is no difference in indirect tax revenue or GST revenue in pushing up the GDP of India, when we consider the number of tax payments from both the side – pre and post implementation of GST. And from the second part which was tested regarding the impact of GST revenue collection on GDP contribution, the treatment does not change, the level of significance is same as in case of pre-implementation of GST.

## Limitations of the Study and Scope for Further Research

As this study is based on secondary data which is collected from reliable sources, the analysis is made only on the basis of revenue collection perspective and its impact on growth of GDP. This research is only limited to revenue collection perspective, and the further studies can be conducted on administrative and structural implications pre and post implementation of GST from different perspectives such as implication on Small and Medium Enterprises, various sectors such as Manufacturing, Banking, Service and Supply Chain and Logistics etc., in order to explore some more inferences of GST.

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