REGIONAL DYNAMICS AND STATE-LEVEL PERFORMANCE IN INDIA'S INDIRECT TAX SCENARIO: EXPLORING GOODS AND SERVICES TAX (GST) REVENUE JOURNEY

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Abstract

Goods and Services tax was implemented in India from 2017 as a new indirect tax law intended to simplify and consolidate the previous tax system. India is a country with large population with diverse geographical regions, it becomes paramount for assessing the GST performance across different regions of the nation. For achieving the goal of the research secondary data of GST revenue from all 28 states and 8 union territories were collected and categorized into six regions. For the study Graph analysis, descriptive analysis, and Kruskal-Wallis tests were employed using Jamovi statistical software. The results of the study demonstrated the States/UTs that excel in terms of GST collection in their designated regions. In Northern region Haryana stands out, Assam leads the pack in Northeastern region, in central region Uttar Pradesh demonstrated a strong performance, in Eastern region West Bengal excels, Maharashtra performs well in the Western region and in Southern region the State of Karnataka is the best performer. These States demonstrated exceptional performance in collecting GST revenue within their regions. Additionally, the study revealed an upward trend in GST revenue performance across all regions of India particularly in Western region. However, it also indicates that certain States/UT's & regions are not performing up to expectations when considering their population size. This research work gives a valuable perspective for the tax department, researchers and policymakers empowering them to develop strategies that can boost the region wise GST revenue collection and will help in promoting economic growth of the country.

Keywords: Indirect Tax, Goods and Services Tax (GST), Revenue performance, Region, India

JEL classification: H71, H20, H21

1. Introduction

The taxation system of India is divided into direct tax (Jha, 2019) and indirect tax (Majumder et al., 2021). Direct tax law is progressive in nature, which means that higher the income higher is the tax (Muduli et al., 2022) and it consist of Income tax act. The progressive nature of taxation helps in redistributing wealth and reduce income inequality amongst the public. Indirect tax is regressive in nature which means that burden of tax fall equally to everyone irrespective of the income level and is a major contributor to government treasury. Indirect tax was covering a number of taxes in Indian tax laws but from 1 July 2017 Goods and Services Tax (GST) was implemented with major agenda to streamline and simplify the complex indirect tax system into one unified tax law in India (Sandhu & Atwal, 2019). In the year of 2000 the concept of GST was introduced in India with the intention to replace existing tax structure (Kumaraswamy, 2020). The previous indirect tax such as Central excise duty, Custom duty tax, Service tax and a variety of state level indirect taxes were replaced after GST introduction (Salim et al., 2019). With introduction of GST law, the cascading effect of multiple taxes has been eliminated (Kumar & Babu, 2018). GST is charged when Good or services are supplied to customers and it is termed as consumption-based tax (Maheshwari & Mani, 2022). This basically means that States/UT's or Regions with

higher distribution of population are expected to have a higher GST collection. India being one of the fastest growing economies (Tripathi, 2018a), the tax policies play a crucial role in shaping a country's advancement and exert a direct influence on its economic efficiency and fairness. An effective taxation policy should ensure equitable income distribution while generating substantial tax revenues for both the Central and State Governments (Nayyar & Singh, 2018) and ultimately connected to the tax potential of the country (Shemyakina et al., 2019). With continuous increase in the population size (Tripathi, 2017b) and with a total of 28 states and 8 union territories in India (Mondal et al., 2023) it becomes crucial to discuss the possible influence of the new tax law. Especially a country like India which is having a regional inequality & diverse economic geography (Dwivedi & Arora, 2020; Chakraborty & Mukherjee, 2023) the study of such a major tax law becomes utmost important.

GST has completed only 6 years since its implementation. The implementation of GST law in India has been considered as the biggest milestone in the countries Indirect tax structure and therefore it becomes very important to evaluate the performance of this tax law in all the States/UT's and regions of India. Particularly important questions need to be answered like how are these 28 states and 8 union territories performing under the GST law? what are the regional dynamics when it comes to GST revenue performance? Does the population size of respective regions and States/UT's play a role in GST revenue performance? Keeping this question in mind an attempt is made by the authors in this research paper to study in detail the State's/UT's & regional wise GST revenue performance in India.

2. Review of literature

Several studies globally have been undertaken in the area of tax performance and Goods and services tax. Many authors have tried to study cross-country tax revenue performance for example (Haldenwang & Ivanyna, 2012) made a comparative study on tax performance in developing countries and tried to study what are the regional patterns, governance, and non-tax revenue. They have adopted quantitative and qualitative approaches in their study. They took a total of 177 countries for their studies and got the result that 36 countries qualified as high tax performers, 41 countries fell into low tax performer groups and 100 countries were average performers. (Morrissey et al., 2016) studied in developing countries the tax revenue performance and what are the vulnerability. They have split the sample into lower and higher income groups and concluded that lower-income countries are susceptible to shocks, particularly concerning trade, while resource-rich countries are more vulnerable to revenue fluctuations, except in the case of natural disasters. One more study (Khujamkulov & Abizadesh, 2023) investigated the trend in tax revenue amongst 33 transitional countries from the period of 1991-2015.They studied the relationship between Per capita GDP and Tax revenue. The core finding of their research was that there exists a positive correlation between per capita GDP growth and increased tax ratios across all tax categories, though to varying degrees. (Mitsopoulos & Pelagidis, 2021) studied the impact of taxation policy on labour. They advocated that in the era of macro-economic factors, globalisation pressure, and the technological advancement it becomes important to study the impact of taxation on labour market. Their finding suggested that competitive nations can use taxation on investment and flexible wages to influence employment whereas less competitive nations are relying on taxation on Investments. (Feder & Mustra., 2018) studied the relationship between fiscal consolidation and regional economics resilience and how they affect each other. They found that fiscal consolidation and regional economics resilience negatively correlated with the negative effect of taxation more than the positive effect of public spending. Further (Savoia et al., 2023) have taken cross-country data for 31 countries and adopted panel time series analysis to study the constraints on executive and taxation revenue in the long run and concluded that tax revenues and political institutions can mutually reinforce each other over time, leading to a co-evolution in the long run. (Anastasiou et al., 2023) examine the presence and direction of causal relationships between tax revenue levels and a specific set of determinants within 26 European countries during the period from 2015 to 2018. The analysis confirms long-run cointegration relationships and significant interdependence among 26 European countries' tax revenue. (Apeti & Edoh, 2023) tried to study the correlation between mobile money and tax revenue. The authors tried to analyse the effect of the use of mobile

money on tax revenue performance and took a total of 104 developing countries from 1990 to 2019.The authors concluded that Mobile money adoption in developing countries increases tax revenue relative to non-mobile money countries. The transparency and efficiency of mobile money systems enhance tax compliance and reduce tax evasion, leading to higher tax collection in developing economies. A few authors have also tried to study Tax performance in their respective countries (Mu et al., 2023) studied revenue collection performance from the Amhara region of Ethiopia. They have taken factors like tax evasion, taxpayer's psychological egoism, and its impact on tax revenue collection. For the analysis, SEM and Multiple regression were adopted and they concluded that tax evasion and psychological egoism have adverse effects on tax revenue collection performance. On the other hand, tax education and technology play crucial roles in significantly and positively impacting tax revenue collection performance. One study from Burundi (Nadoricimpa, 2021) tried to develop an association between tax reforms and civil conflicts with tax performance. After conducting an estimation of a tax equation, the findings suggest that civil conflicts and tax reforms had no significant impact on total tax revenue, international trade taxes, or income taxes. One more study from sub-Saharan Africa (Alabede, 2018) conducted a study to examine the relationship between economic freedom and tax revenue performance in sub-Saharan Africa. The research aims to determine if higher levels of economic freedom in the region contribute to improved tax revenue outcomes. The author concluded that economic freedom has a positive effect on tax revenue performance. Specifically, property rights freedom, freedom from corruption, investment freedom, and composite economic freedom all demonstrated a substantial and positive impact on tax revenue. A study from the tourism sector by (Feshari et al., 2016) tried to build up a relationship between tax ratio, tourism receipt, and GDP per capita in select Islamic regions. Their study highlighted that the tax ratio is affecting both tourism receipts and GDP per capita. One study from Australia (Smith, 2020) mentioned the advantages and disadvantages of the GST revenue arrangements which have undergone shifts since its introduction in 2000 in Australia, and highlighted that GST as a revenue source for Australian states remains uncertain, as federal financial relations are subject to long-term uncertainty. A study from Australia (Giesecke et al., 2021) adopted econometrics analysis to study the impact of GST on States and territories economies. They identified the specific States and territories that have been negatively affected by changes in the Goods and Services Tax. Additionally, the authors provided an in-depth analysis of the regional structural factors responsible for the variations in the impacts experienced across different regions. In Nigeria (Omodero, 2019) tried to explore the relationship between the Shadow economy and corruption. The author investigated the influence of the informal economy and graft on tax revenue performance in Nigeria. For the study, the author collected secondary data spanning the period from 1996 to 2018.The multi-regression analysis shows that the shadow economy and corruption negatively impact tax revenue performance in Nigeria. Both factors are found to have adverse influences on the country's tax revenue generation.

In India, few studies have been undertaken to study the revenue performance of GST. (Khoja & Khan, 2020) empirically examined the potential impacts of GST on cascading effects and consequently revenue collection in the Indian economy. For the study they have adopted time series data from 1990 to 2017. From the analysis the authors concluded that the cascading effect had been reduced due to the introduction of GST law and at the same time it had boosted the tax revenue of the country. (Paliwal et al., 2019) studied in detail the overall effect of GST on tax revenue collection in the country. Utilizing the tax buoyancy approach they seek to assess how the implementation of GST has influenced tax revenue generation in the country. The authors' findings reveal that after the implementation of GST India's tax revenue has displayed reduced responsiveness to changes in GDP. Couple of papers had addressed and studied the impact of Covid 19 on GST in India. (Naik & Haldankar, 2021) studied how covid 19 pandemic had an impact on GST revenue performance of all 28 states of India. They concluded that the covid 19 pandemic had led to a revenue loss of the government, Interestingly the impact of the COVID-19 pandemic on GST collection in larger states appears to be non-significant. However, for smaller states like Manipur and Goa, there is a notable difference in GST revenue collection and distribution between the periods before and after the lockdown. In one more study (Haldankar et al., 2022) tried to study the revenue

performance of GST in India. Their conclusion indicates that various components of GST, such as CGST, SGST, IGST, and Comp. Cess, had a positive impact on India's indirect tax collection. Nevertheless, the pandemic of COVID-19 significantly affected the country's indirect tax revenue resulting in a decline in overall GST tax collection.

Some studies addressing GST revenue performance have been conducted at the individual State level in India for example (Dey, 2021) studied the impact of GST on the indirect revenue performance of Odisha state of India. For the study, the author collected GST revenue data from July 2017 to March 2021. The author concluded that as of now Odisha state has not been able to realize the expected tax revenue and the situation may become unfavourable when the Central Government discontinues providing Compensation cess after July 2022. In one more study (Nayaka & Panduranga, 2019a) analysed the impact of GST on Indirect taxes of the Indian state of Karnataka. They made use of secondary data and concluded that there has been a noticeable upward trend in indirect tax collections for the state, attributed to the enhanced features of GST compared to previous tax systems. The implementation of GST has led to increased tax collections, higher registration rates, and greater return filings for the State.

From the above literature review, it is evident that no substantial and complete studies have been under to study the States/UTs and region-wise GST revenue performance in India, hence this research paper aims to address the notable research gap concerning the GST revenue performance in Indian states, Union territories & regions. Further, an in-depth analysis has been conducted by the researchers to understand the probable impact of GST tax law on revenue generation amongst the regions. This paper will offer a better understanding of the revenue disparities observed allowing the different stakeholders and policymakers to understand the effectiveness of the new tax reform.

3. Research methods and materials

3.1. Objectives of the study

The overall objective of this paper is to study and compare region wise performance of Goods and services tax (GST) revenue collection in India since its inception and also to examine individually the performance of GST revenue in each State and Union territories of India.

3.2. Hypotheses of the study

To achieve the objective of the study of the following hypotheses have been constructed

Ho1: There is no significant difference between GST revenue performance of Northern regions of India.

Ho2: There is no significant difference between GST revenue performance of Northeastern regions of India.

Ho3: There is no significant difference between GST revenue performance of Central regions of India.

Ho4: There is no significant difference between GST revenue performance Eastern region of India.

Ho5: There is no significant difference between GST revenue performance of Western regions of India.

Ho6: There is no significant difference between GST revenue performance of Southern regions of India.

Ho7: There is no significant difference between region wise GST revenue performance of India.

3.3. Study design and Sources of data collection

The researchers have adopted the categorization of all 28 states and 8 union territories of India into six regional zones based on the States Reorganisation Act, 1956 enacted by the government of India (Table 1). Additionally graphical representation of these six regions have been incorporated through the map to offer a clear understanding of the geographical distribution of the region along with inadept analysis (Figure 1). The map categorization was

drawn using mapchart.com https://www.mapchart.net/india.html. These zones have been classified on the basis of their culture, demography, climate, and different language (Bairwa & Sharma, 2019). The regional classifications are as follows:

Table 1. Region-wise categorization of States and Union territory of India

Regional Zones	States/Union Territory
Northern region	Chandigarh (UT), Delhi (UT), Jammu and Kashmir (UT), Ladakh (UT), Himachal Pradesh, Haryana, Punjab, and Rajasthan
Northeastern region	Sikkim, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Assam, Mizoram, and Tripura.
Central region	Chhattisgarh, Madhya Pradesh, Uttarakhand, and Uttar Pradesh.
Eastern region	Bihar, Jharkhand, Odisha and West Bengal.
Western region	Dadra & Nagar Haveli and Daman & Diu (UT), Goa, Gujarat, and Maharashtra.
Southern region	Puducherry (UT), Andaman and Nicobar Islands (UT), Lakshadweep (UT) Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, and Telangana.

Source: Author's compilation.

Figure 1: Map of region wise categorization of States/UT's
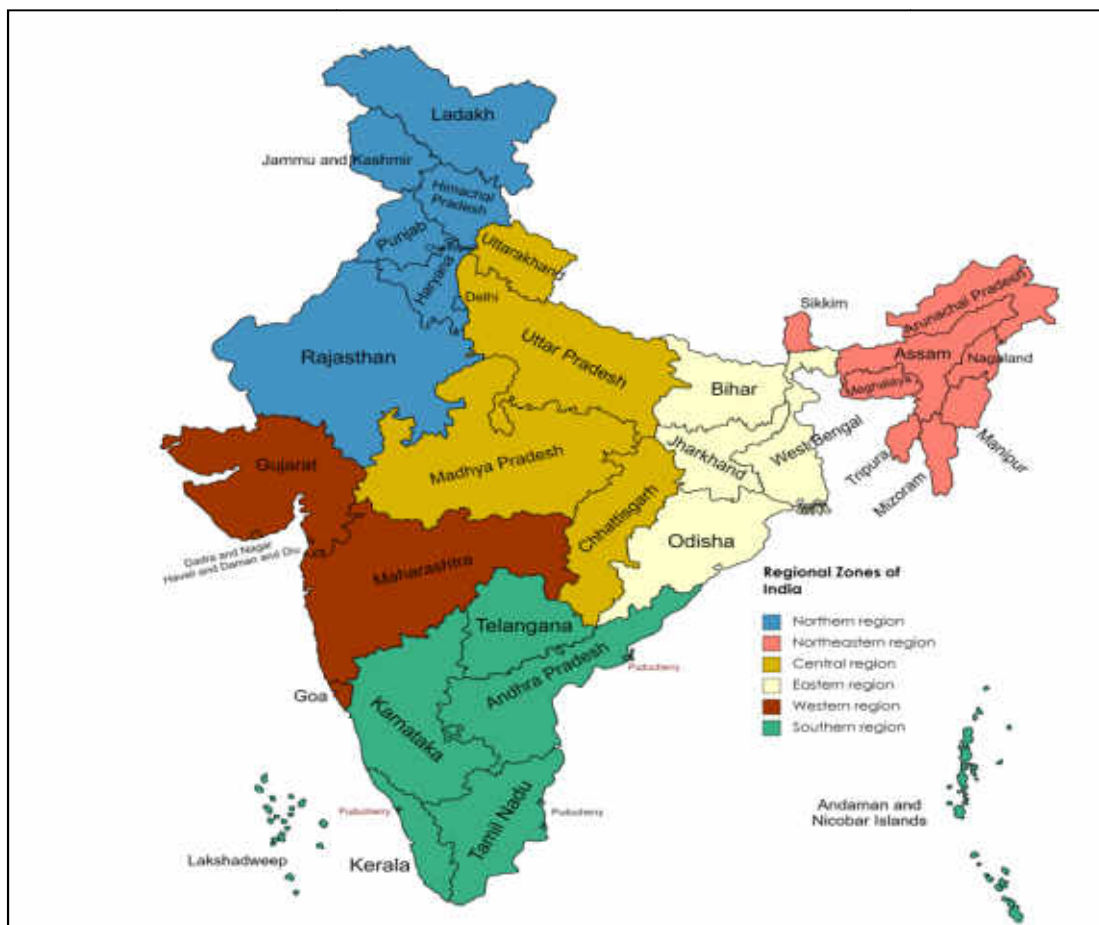
Source: created by authors as per State Reorganisation Act 1956, Government of India

The research is based on already published secondary raw data. The data was collected from official government websites. The first one is from the GST council of India website https://gstcouncil.gov.in/gst-revenue. The Second one is from GST statistic portal website https://www.gst.gov.in/download/gststatistics and the third one is from the Press Information Bureau, Government of India website https://pib.gov.in. For fulfilling the objective of the study monthly raw data of GST collection of each 28 States and 8 Union territories have been collected for the period from July 2017 to June 2023.This raw data was then organized and grouped into six regions using Microsoft Excel. A total of seven hypotheses have been framed for the study. The Hypothesis from Ho1 to Ho6 is framed and tested to understand if there is a significant difference between GST revenue performance of States/UTs of within each region of the country. Additionally, to understand if these six regions have differences when it comes to GST revenue performance hypothesis Ho7 is framed and tested to understand regional

dynamics. The assumption of normality of data was tested through Shapiro wilk test and subsequently, non-parametric Kruskal-Wallis test was applied for testing each hypothesis. The analysis was conducted through Jamovi statistical software. Further to get major insights about which States/UTs from each region as well as to assess the overall performance of all the regions in terms of GST revenue, graph analysis and descriptive statistics are employed. Since GST is a consumption-based tax, the population size also plays an important role in influencing the growth of GST revenue collection. Hence the authors further have tried to add to the discussion of the study by establishing a relation between population and important States from each region. The population data has been referred from the latest population census of India.

4. Results

4.1. Performance of GST revenue collection of northern regions of India.

In Table 2 result of Normality of data has been provided. In Table 1 Shapiro-wilk test (Shapiro & Wilk, 1965) the result shows that the assumption of normality is violated as p value is less than 0.001 and hence, we applied Kruskal-Walli's test (Kruskal & Wallis, 1952) Table 2. Kruskal-Walli's test (Table 2) was applied to understand if there was a significance difference in GST revenue performance amongst the States/UT's of Northen regions of India. The test has given chi-square statistic result of 525 with 7 degrees of freedom and the p value was < 0.001. This suggests that there were significant differences in GST revenue performance among the States/UT's of Northern regions of India hence the null hypothesis (Ho1) stands rejected.
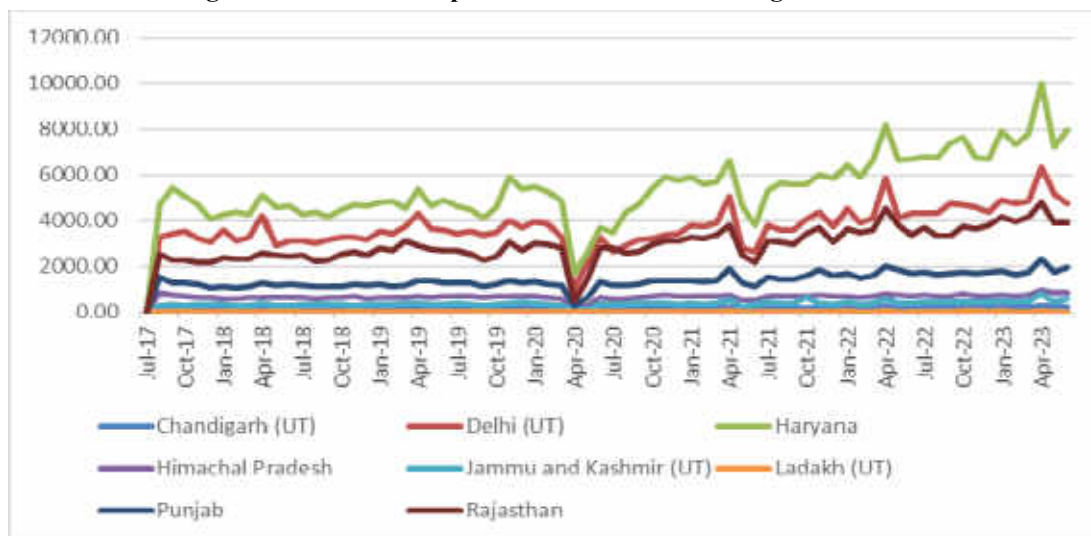
Table 2. Northern regions Shapiro-Wilk test & Kruskal Wallis test

Normality test -Shapiro-Wilk		Kruskal-Wallis test		
Statistic	P Value	χ^2	Df	P Value
0.743	<.001	525	7	< .001

Source: Author's calculations.

Figure 2 provides graphical representation of GST revenue performance in the Northern regions. The highest GST collection is demonstrated by the state of Haryana with a total of Rs. 3,86,568.30 crores in six years and average of Rs. 5369 crores (645.07 million USD approx.). This is followed by Union territory of Delhi with a total collection of Rs. 2,65,306 crores and average of Rs. 3685 crores (443.12 million USD approx.). On fourth is the State with the largest area in the nation is Rajasthan with a GST collection totalling to Rs 2,10,331.10 crores and average yearly collection is Rs. 1921 crores (231.49 million USD approx.). Punjab state is on fourth rank with total of collection of Rs. 98,141.95 crores and average collection of Rs. 1363 crores (164.17 million USD approx.). Fifth with a total collection of Rs. 47,340 crores is the State of Himachal Pradesh with an average collection of Rs, 658 crores (79.28 million USD approx.). It is followed in sixth place by UT of Jammu and Kashmir with Rs. 25,520 crores total collection and average collection of Rs. 355 crores (42.73   million USD approx.). This is followed by another UT on seventh position, Chandigarh with total GST collection of Rs. 11,671.48 crores with average collection of Rs. 162 crores (19.49 million USD approx.) and last with lowest total collection in Northern region is of the UT of Ladakh with a total Rs. 736 crores with an average of only Rs. 10.2 crores (1.23 million USD approx.). From the graph 1 it is clear that there are fluctuations in GST revenue collection across different States and UT of Northern regions. Some States are witnessing higher collection while other are experiencing lower collections. Overall, the Northern regions are showing a positive upward trend in GST revenue collection with slight dip due to Covid 19 pandemic.

Figure 2: GST revenue performance of Northern regions of India

Source: Drawn by the authors

4.2. Performance of GST revenue collection of northeastern regions of India.

In Table 3 Shapiro-wilk test the result shows that the assumption of normality is violated as p value is less than 0.001 and we applied Kruskal-Walli's test Table 3. As per the test p-value is less than 0.001 which indicate that that there are significant differences in GST revenue performance among the Northeastern regions of India hence the null hypothesis (Ho2) stands rejected.
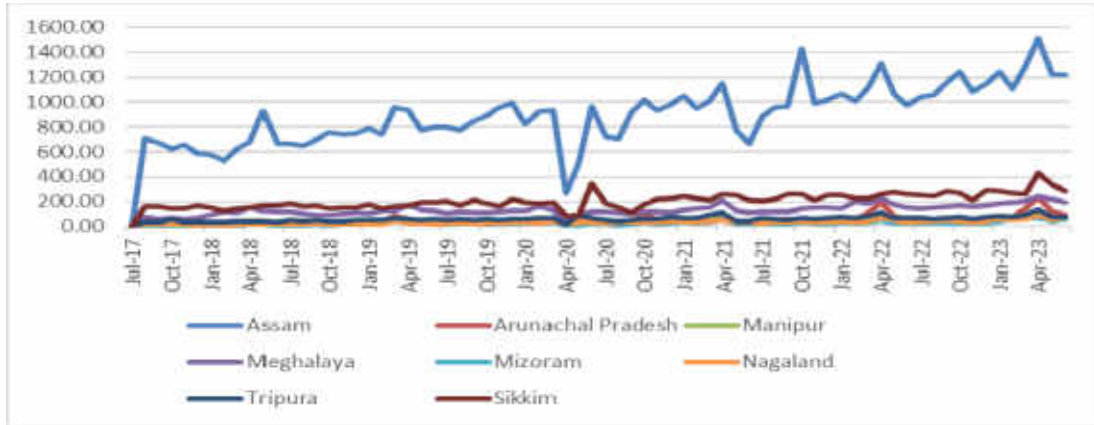
Table 3. Northeastern regions Shapiro-Wilk test & Kruskal Wallis test

Normality test (Shapiro-Wilk)		Kruskal-Wallis test		
Statistic	P Value	χ^2	Df	P Value
0.661	<.001	439	7	< .001

Source: Author's calculations.

In figure 3 it is clear that the State of Assam is having highest average GST revenue of Rs. 889.7 crores (107.08 million USD approx.) with a total GST revenue collection of Rs.64,055 crores in six years. The State of Sikkim with average collection of Rs. 203.2 crores (24.47 million USD approx.) and collection totalling to Rs. 14,631 crores ranks second. Attaining the third rank is the state of Meghalaya collecting an average of Rs.130 crores (15.64 million USD approx.) and a total GST collection of Rs. 9361.10 crores. Following closely is the state of Tripura, ranking fourth with a total GST collection of Rs. 4215.12 crores and an average collection of Rs. 58.40 crores (7.02 million USD approx.). Arunachal Pradesh having the largest area in the region claims the fifth position, gaining total of Rs. 3930.15 crores and average collection of Rs. 54.60 crores (6.57 million USD approx.). Sixth in line is Manipur State. Its average collection is Rs. 36.20 crores (4.37 million USD approx.) and aggregate is Rs. 2614.60 crores. On Sixth rank is the State of Nagaland with average yearly collection of Rs. 31.20 crores (3.75 million USD approx.) and total collection of around Rs.2242.02 crores. Mizoram State took the last place with lowest average collection of Rs. 24 Crores (2.89 million USD approx.) and total collection of Rs. 1731.12 crores. Overall in Figure 3 it is evident that there has been a positive growth in revenue performance of states in Northeastern region with a visible impact due to covid 19 pandemic.

Figure 3: GST revenue performance of Northeastern regions of India

Source: Drawn by the authors

4.3. Performance of GST revenue collection of central regions of India.

In Table 4 Shapiro-wilk test the result shows that the assumption of normality is violated as p value is less than 0.001 and we applied Kruskal-Walli's test Table 4. As per the test p-value is less than 0.001 which indicate that that there are significant differences in GST revenue performance among the Central regions of India hence the null hypothesis (Ho3) stands rejected.
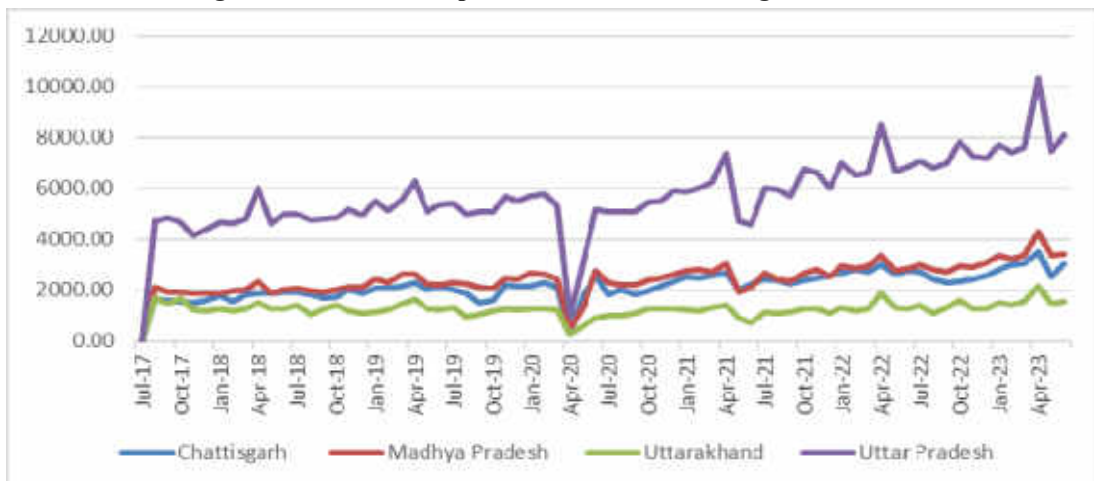
Table 4. Central regions Shapiro-Wilk test & Kruskal Wallis test

Normality test (Shapiro-Wilk)		Kruskal-Wallis test		
Statistic	P Value	χ^2	Df	P Value
0.836	<.001	216	3	< .001

Source: Author's calculations

In Figure 4 it is evident that in Central regions of India Uttar Pradesh State is having highest GST total collection of Rs 4,10,873 crores with an average collection of Rs. 5707 crores (687.08 million USD approx.) in six years. This is followed by the state with largest area in the region, Madhya Pradesh ranks second with Rs. 2432 crores (292.86 million USD approx.) average collection and total Collection of Rs. 1,75,091.27 crores. Chhattisgarh stands on third rank with an average collection of Rs. 2154 crores (259.47 million USD approx.) and total collection Rs.1,55,093.28 crores and last State in Central region is Uttarakhand with an average collection of Rs. 1233 crores (148.35 million USD approx.) and a total collection of Rs.88,803.31 crores. Overall, the Figure 4 illustrates that there has been an upward growth in GST revenue performance in Central regions of India with little dips in between due to covid 19 pandemic.

Figure 4: GST revenue performance of Central regions of India

Source: Drawn by the authors

4.4. Performance of GST revenue collection of eastern regions of India.

In Table 5 Shapiro-wilk test the result shows that the assumption of normality is violated as p value is less than 0.001 and we applied Kruskal-Walli's test Table 5. As per the test p-value is less than 0.001 which indicate that that there are significant differences in GST revenue performance among the Eastern regions of India hence the null hypothesis (Ho4) stands rejected.
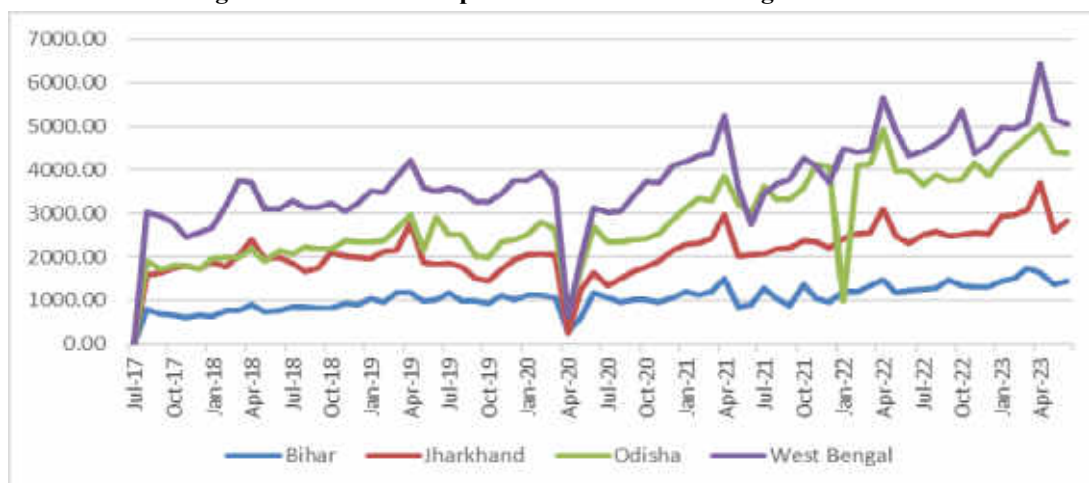
Table 5. Eastern regions Shapiro-Wilk test & Kruskal Wallis test

Normality test (Shapiro-Wilk)		Kruskal-Wallis test		
Statistic	P Value	χ^2	Df	P Value
0.950	<.001	192	3	< .001

Source: Author's calculations.

Figure 5 is depicting that the State of West Bengal is having highest total collection of Rs.2,68,782.87 crores with average collection of Rs. 3733 crores (449.22 million USD approx.) in six years followed the largest state of Eastern region, Odisha with a total collection Rs. 2,05,894.56 crores and average collection of Rs. 2869 crores (345.56 million USD approx.). Jharkhand state has taken third place with average collection of Rs. 2089 crores (251.63 million USD approx.) and total collection is Rs.1,50,393.03 crores. On last, State with a lowest collection in eastern region is Bihar with an average collection of Rs. 1043 crores (125.85 million USD approx.) and a total collection of Rs.75,067 crores. Overall, as per the analysis it is evident that there has been an upward trend in GST collection in Eastern regions with some variations with visible impact due to covid 19 pandemic.

Figure 5: GST revenue performance of Eastern regions of India

Source: Drawn by the authors

4.5. Performance of GST revenue collection of western regions of India.

In Table 6 Shapiro-wilk test the result shows that the assumption of normality is violated as p value is less than 0.001 and we applied Kruskal-Walli's test Table 6. As per the test p-value is less than 0.001 which indicate that that there are significant differences in GST revenue performance among the Western regions of India hence the null hypothesis (Ho5) stands rejected.

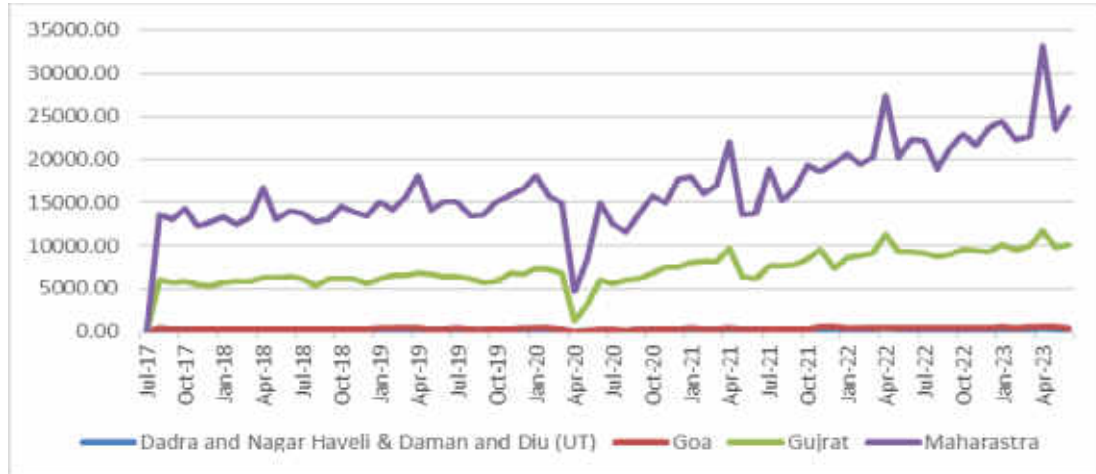**Table 6. Western regions Shapiro-Wilk test & Kruskal Wallis test**

Normality test (Shapiro-Wilk)		Kruskal-Wallis test		
Statistic	P Value	χ^2	Df	P Value
0.756	<.001	242	3	< .001

Source: Author's calculations

In figure 6 it is clear that the Maharashtra State which is having the largest aera in Western region is the top performing State with an average of Rs. 16,636 crores (2 billion USD approx.) and a total of collection of Rs. 11,97,789.10 crores in six years followed Second is the state of Gujarat with average of Rs. 7161 crores (861.46 million USD approx.) and total collection of Rs. 5,15,537.81 crores. The state of Goa ranks third with total collection of Rs.

25,926.21 crores and average collection of Rs. 360 crores (43.37 million USD approx.). The UT of Dadra & Nagar Haveli and Daman & Diu is ranked last with total collection of. Rs. 18,564.84 crores and average GST collection of Rs. 258 Crores (31.05 million USD approx.). Overall, the graph depicts that there has been an overall growth in GST revenue performance in Western regions of India with slight impact due to covid 19 pandemic.

Figure 6: GST revenue performance of Western regions of India

Source: Drawn by the authors

4.6. Performance of GST revenue collection of southern regions of India.

In Table 7 Shapiro-wilk test the result shows that the assumption of normality is violated as p value is less than 0.001 and we applied Kruskal-Wallis test Table 7. As per the test p-value is less than 0.001 which indicate that that there are significant differences in GST revenue performance among the Southern regions of India hence the null hypothesis (Ho6) stands rejected.

Table 7. Southern regions Shapiro-Wilk test & Kruskal Wallis test

Normality test (Shapiro-Wilk)		Kruskal-Wallis test		
Statistic	P Value	χ^2	Df	P Value
0.781	<.001	523	7	< .001

Source: Author's calculations

In Figure 7 it is clear that the largest State of Southern region Karnataka is having highest average GST collection of Rs. 7,510.69 crores (904.07 million USD approx.) with total collection of Rs.5,40,769.97 in six years. Tamil Nadu is on second position with average collection of Rs. 6656.98 crores (800 million USD approx.) and total of Rs. 4,79,302.49 crores. Telangana State ranks third with average collection of Rs. 3411.40 crores (411.16 million USD approx.). Telangana total collection stands at Rs.2,45,626.56 crores. Fourth is Andhra Pradesh with average collection of Rs. 2,457.20 crores (295.68 million USD approx.) and total of Rs.1,77,002.17 crores. Kerala State is on fifth rank with average of Rs. 1686.66 crores (203.29 million USD approx.). The cumulative collection of Kerala comes to Rs.121,439.30 crores. Next is UT Puducherry with average of Rs. 160.84 crores (19.37 million USD approx.) and aggregate of Rs. 11,580.19 Crores. On seventh is UT of Andaman and Nicobar Islands with average GST collection of Rs. 26.94 crores (3.24 million USD approx.) and aggregate of Rs. 1938.48 crores. Last in Southern region is the UT of Lakshadweep which is having the lowest area in the country. Its total GST collection is only Rs. 126 crores with a low average collection of just 1.76 crores (2,10,000 USD approx.)

Figure 7: GST revenue performance of southern regions of India
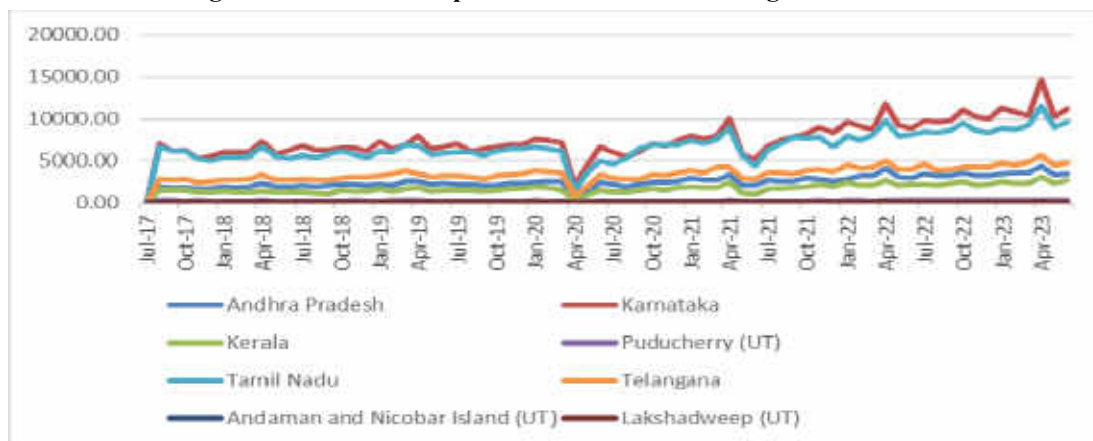
Source: Drawn by the authors

4.7. Region wise performance of GST revenue collection in India.

In Table 8 Shapiro-wilk test the result shows that the assumption of normality is violated as p value is less than 0.001 and we applied Kruskal-Wallis test Table 8. As per the test p-value is less than 0.001 which indicate that that there are significant differences in GST revenue performance among the regions of India hence the null hypothesis (Ho7) stands rejected.

Table 8. Region wise Shapiro-Wilk test & Kruskal Wallis Test

Normality test (Shapiro-Wilk)		Kruskal-Wallis test		
Statistic	P Value	χ^2	Df	P Value
0.892	<.001	338	5	< .001

Source: Author's calculations

In Figure 8 it is clear that the western region is having highest average GST revenue of Rs. 24,415 crores (2.93 billion USD approx.) and total collection of Rs. 17,57,853.95 in last six years followed by Southern region with average collection of Rs. 21,914 crores (2.63 billion USD approx.) and total collection of Rs. 15,77,786.53 crores. Northern region is on third rank with average collection is Rs. 14,522 crores (1.74 billion USD approx.) and total collection of Rs.10,45,617.91 crores. On fifth rank is Central region with an average collection of Rs. 11,526 crores (1.38 billion USD approx.) and total collection of Rs.8,29,861.54 crores. Eastern region is on sixth place with an average collection of Rs. 9,724 crores (1.17 billion USD approx.) and total collection of Rs.7,00,137.54 crores and last amongst the regions is Northeastern with an average collection of only Rs. 1,428 Crores (171.86 million USD approx.) and total GST collection of Rs. 1,02,782 crores. As per the data & graph analysis it is very much clear that all the regions are moving on upward direction in GST revenue performance with a noticeable disparity amongst this region

Figure 8: Region wise GST revenue performance in India
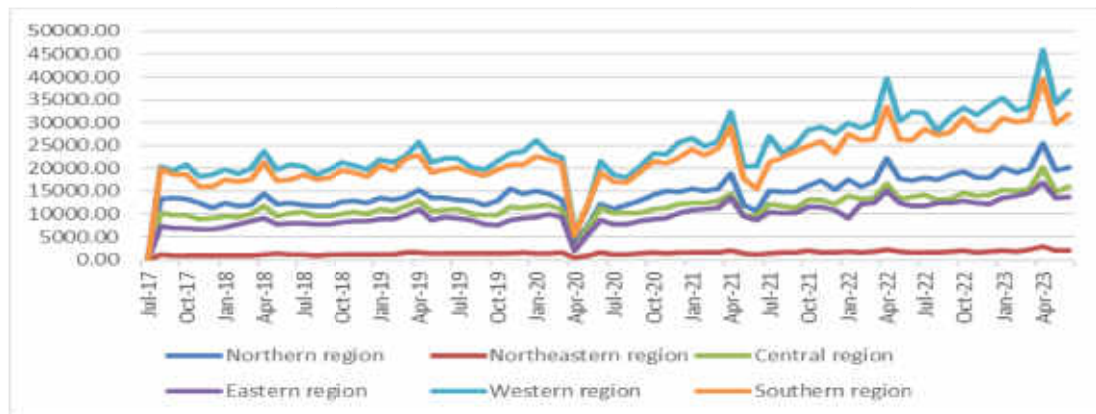
Source: Drawn by the authors

5. Discussion

The examination and analysis of performance of GST revenue collection across regions of India clearly shows that there has consistent upward trajectory in all these regions. Even though there has been upward trend there has been a significant variation amongst this States and Union territories within these regions which is evident after applying Kruskal Wallis test for each region. If we talk about Northern region the state of Haryana has been on top in revenue collection as compared to other States and Union territories within the region. Interestingly Haryana State is on third rank in terms of population size in Northern region below the state of Rajasthan and Punjab, this is majorly due to the fact majority of automobiles production of the country takes place in the state of Haryana. Moving to the Northeastern region, Assam takes the lead as the best performer and it's having the highest population in the region. Notably, Sikkim, with its comparatively lowest population in the region, ranks second in total GST collection after the state of Assam. This is primarily due to the reason that Sikkim industrial sector is heavily based on agriculture economy and as well as the state is home to numerous pharmaceuticals companies. Next region is the Central region in which the most populous state of the country, Uttar Pradesh stands out with highest GST revenue. Shifting to the Eastern region, West Bengal leads in GST collection compared to its counterparts. Its noteworthy that the third populous state of the nation, Bihar contributes the lowest GST revenue among the eastern region group. This is mainly attributed to the fact that Bihar's per capita is the lowest in the country. In the western region, the state of Maharashtra which is the economic hub of the nation demonstrates the highest GST revenue collection and it is one of the highest populous states in India. Interestingly the state of Goa in this region which is the smallest State in India with low population has been performing very well as compared to all the other small states. This success is mainly due to the large tourism related activities happening in Goa and also Goa is having highest per capita in the country. In the Southern region, Karnataka takes the lead, despite being the second most populous state in the group after the State of Tamil Nadu, primary due to the strong presence of number of IT companies in Bangalore the capital city of Karnataka. Overall, the Western region has exhibited a strong GST revenue performance majorly driven by the state of Maharashtra as compare to other regions of the country. Surprisingly the total population of western region ranks fourth amongst the group. This is primary due to Maharashtra's capital city of Mumbai which is considered as the financial city of the country which has attracted global businesses, has a strong hold in service industry and very high presence of commercial & retail activities. In summary our research study has given strong evidence that some States and UT's with large population are having low GST performance. The major reason for this phenomenon is that GST is a Consumption based tax (Dash & Kakarlapudi, 2022; Garg et al, 2023), Some States/UT's which are producing goods or service are supplying this to other States/UT's and this States are getting the benefit of GST collection as these goods or services are consumed in their State/UT's. In this manner the manufacturing/producing States/UT's are losing GST revenue collection. This finding aligns with the finding of (Nayaka & Panduranga, 2019b). The consequences of this will be the State/UT's will face revenue shortfall resulting in fiscal imbalance in the respective States/UT's.

Additionally, it is essential for researchers from States/UT's & region with lower revenue performance to delve into the other underlying factors contributing to this disparity compared to other states or union territories in their respective regions at a ground level. Different factors as suggested by various researcher such as Human capital formation (Hussain & Das., 2023), level of consumption (Das & Ray., 2019), Consumer behaviour (Jolley et al, 2017) , Tax rate of GST (Amri et al, 2019) etc will have probable impact on revenue performance of the country.

6. Conclusion

In conclusion, this research delves and explores the six-year journey of Goods and Services Tax (GST) implementation in India, concentrating on regional dynamics and state-level performance. The study categorizes the 28 States and 8 Union territories into six regions and studies the GST revenue collection across these regions. Utilizing statistical tools such as graph analysis, descriptive analysis, and Kruskal-Wallis tests, the research identifies

States/UT's that excel in GST revenue performance within their respective regions. The findings highlight significant variations in GST performance among States and Union territories within each region. The state of Haryana is the best performer in Northern region. In Northeastern region the state of Assam leads. Uttar Pradesh State exhibits very good performance in Central region. In Eastern regions West Bengal outperformance, Maharashtra is top performer in Western region. The study has highlighted overall a positive upward trend in GST revenue collection across all the regions with some dips due to the recent covid 19 pandemics with Western region being the best performing region. It is noted that GST is consumption-based tax and it is implied that the state with high population will have better revenue performance but our finding is challenging the assumption that population size directly correlates with revenue collection. It is revealed that few States/UT's and regions are not meeting their tax revenue expectations whereas some states are performing very well as considering their population size. The researcher has highlighted the underlying reasons for the same. The author's underscore that being a consumption-based tax GST can result into budgetary disparity amongst the States/UT's and across the regions. In fact, the states which are producing or manufacturing may come across difficult situation in collecting GST revenue as their output will be consumed by other States/UTs. Our finding emphasizes that the policymakers, tax authority and researchers to study other possible factors and develop appropriate strategies addressing the regional disparities. Additionally, this study provides a valuable resource for the countries policymakers to indulge into a process of improving the regional economics along with addressing the fiscal imbalance across the regions. In summary, this research adds to the existing literature by providing in-depth perspectives into the GST revenue performance at the Stats/UT's and regional levels. As India persist to navigate the complexities of its new indirect tax system, the findings offer a valuable foundation for future research and policy development aimed at improving effectiveness of GST implementation and encourage inclusive economic growth.

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