

Post-Pandemic Fiscal Resilience: A Study of Karnataka's IGST Collection and Economic Interventions



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Abstract

Karnataka, one of India's prominent economic states, relies significantly on Goods and Services Tax (GST) collections to support its infrastructure, public services, and welfare schemes. The dual disruptions brought by the implementation of GST and the COVID-19 pandemic posed serious fiscal challenges to the state. The pandemic caused major economic slowdowns—supply chain disruptions, declining consumer demand, and business closures—resulting in substantial fluctuations in GST revenue, a key indicator of economic activity and consumption. This study aims to evaluate the impact of the COVID-19 pandemic and GST transition on Karnataka's revenue system, with particular emphasis on GST performance. The objective is to analyze trends, assess sectoral impacts, and examine policy responses to revenue shortfalls during the crisis. Empirical methods, including trend analysis and basic statistical tests, were applied to GST revenue data from 2019 to 2022. Sectoral analysis revealed that tourism, manufacturing, and IT experienced sharp downturns in GST contributions, while agriculture remained relatively resilient due to steady demand and policy support. Government interventions such as stimulus packages and GST compensation from the Centre mitigated the revenue decline to an extent. The study concludes that Karnataka's revenue system is vulnerable to external shocks but can be strengthened through strategic reforms. Recommendations include diversifying the revenue base, enhancing digital tax infrastructure, and introducing sector-specific support mechanisms. Although focused on Karnataka, the study offers broader insights applicable to other Indian states navigating post-pandemic fiscal recovery.

1. Introduction

Economic downturns, characterized by general dislocation of economic activity, have long-term effects on the fiscal health of nations and their constituent governments. Economic downturns, whatever their origin global pandemics, financial crises, or geopolitical tensions often lead to reduced economic production, increased unemployment and increased public revenues. For a major economic center in India such as Karnataka, data about the effect of such crises on its own revenues is important to facilitate effective fiscal planning and policymaking. One of the most powerful revenue instruments of Indian states since 2017 has been the Goods and Services Tax (GST), an overarching indirect tax on the provision of services and goods. GST collections are an indicator of economic activity, a measure of consumption habits, business activity, and general level of economic prosperity.

1.2 The Significance of GST in India's Taxation System

Implementation of the Goods and Services Tax in 2017 was a major overhaul of the Indian taxation system in going for a single-tax regime instead of a set of indirect taxes such as VAT, excise duty, and service tax. GST has implemented uniformity of taxation, prevented cascading of tax, and enhanced compliance on an online portal, making it more convenient for businesses to operate state by state. For the state of Karnataka with its diversified economic profile of IT, manufacturing, and agriculture, GST has been a game-changer because it has widened the state's tax base as well as enhanced efficiency in revenue collection. The suitability of GST, however, also rests on its responsiveness to economic conditions because collection depends heavily on consumption and business activity.

Introduction of GST in India was aimed to unify the tax structure, make it compliance-friendly, and raise the collection to a greater extent with the help of a uniform tax structure. But during economic downturns, the robustness of such a system is put to the test, and it has to see how such a crisis affects the GST cases of Karnataka. The COVID-19 pandemic starting from sometime in early 2020 is one of the largest economic interventions. The pandemic was of a size and scale unlike anything in previous economic slumps, including a public health crisis alongside unprecedented economic ferocity. The March 2020 national lockdown by the Government of India brought economic activity to a grinding halt, affecting trade, supply chain, and customers trends nationally. In Karnataka, the effect was especially harsh in terms of the dependence of the state on industries such as IT, tourism, and manufacturing, which were also badly affected by the lockdown. The sudden stoppage of economic activity resulted in a steep decline in GST collections, with business houses closing and consumer expenditure going down drastically. The current project aims to examine how the COVID-19 pandemic has impacted the revenues of Karnataka's GST, that is, the level of decline, the most impacted sectors and the post-lockdown recovery trajectory. An understanding of the impact of economic crises on GST revenues is not an intellectual requirement but a policy maker and administrator imperative. In Karnataka, where GST constitutes a sizeable proportion of the state's own tax realizations, any dislocation can have important implications for the state's budget estimates and government spending. Focusing on the COVID-19 era, the present work attempts to provide some perspective on the weaknesses of the state's financial system during times of crises and identify areas where policy intervention can occur.

The outbreak of COVID-19 in early 2020 caused a huge burden on India's tax collection system, and even more so on Goods and Services Tax (GST) collection. Being a tax on consumption, GST collection has a direct correlation with economic activity and therefore sensitive to disruption because of events like the pandemic. The first and direct consequence of the COVID-19 lockdown was a sudden decline in GST collections, which understood the steep fall in economic activity. In April 2020, when the pandemic was at its height the lockdown, the GST collection had dropped to 32,172 crores, dropping by over 70% from 1,13,865 crore in April 2019. It was a steep decline due to shutting down of shops, delayed manufacturing, and sharp reduction in consumer expenditure. Non-essential segments such as retail, hospitality, and automobiles had virtually zero activity while even primary industries were beset by logistics owing to mobility constraints. The decline in GST collections was a serious problem to the central and the state governments as it curtailed their area of funding essential services and relief measures at a time when public expenditure was most needed.

1.3 National Impact of GST Collections Amidst COVID19

The Covid-19 pandemic that devastated India during the first half of the year 2020 presented economic challenges of unrivalled scope to the country and disproportionately weighed on Goods and Services Tax (GST) collection in the country. The March 2020 lockdown reduced economic activity to the verge of nil in the entire country and resulted in a significant decline in GST collections. The article describes the all-India effect of the pandemic on GST collection, establishing prevailing trends, the uneven effect on Integrated GST (IGST), and parallelism with Karnataka's experience.

The COVID-19 pandemic severely impacted GST collections, especially in sectors like tourism, aviation, hospitality, and automotive, due to halted operations and reduced demand. While essentials and pharma showed resilience, overall consumer spending dropped, particularly on luxury goods. Supply chain disruptions and unorganized sector shutdowns further weakened GST revenue performance.

1.4 Government Response to the Decline

To combat the impact of falling GST collections, the Indian government made several policy measures. The GST Council deferred deadlines for filing returns and exempted late fees on distressed businesses with a view to easing compliance in the lockdown period. Apart from this, the government reduced GST rates on critical items such as sanitizers and masks to make them affordable and boost consumption. Central government compensation payments to the states on account of dwindling revenue were also made to compensate for revenue losses, under the GST compensation fund, which provides states with a 14% increase in GST revenues during the first five years. Despite, however, the shock fall in collection strained the compensation fund, leading to delayed payments and necessitating states to step out and borrow in the market to fund their fiscal needs, a matter which had particularly been acute in the case of states like Karnataka.

This paper investigates the reaction of the state government to the decline in GST collections, including central government compensation, borrowing, and fiscal stimulus packages. These results can guide planning strategies to minimize the impacts of future crises, encouraging fiscal stability and economic resilience. The primary objective of this project is to analyse the impact of economic crises on Karnataka GST collections using the COVID-19 pandemic as a point of reference. The study will investigate the trend in GST collections before, during, and after the pandemic and identify the significant sectors that were most impacted.

2. Review of Literature

The COVID-19 pandemic has had a profound impact on economies worldwide, including India. Karnataka, as one of India's most industrialized states, faced significant challenges in maintaining fiscal resilience. (Ingole, 2022) examines Karnataka's Integrated Goods and Services Tax (IGST) collection and the economic interventions implemented to navigate the post-pandemic landscape. Karnataka being a major contributor to India's GDP, was heavily impacted by the pandemic. The state's economy, which is diversified across industries such as IT, manufacturing, and agriculture, experienced disruptions due to lockdowns and supply chain issues. The central government's fiscal packages were crucial in supporting states like Karnataka. Paper 1 highlights the importance of fiscal stimulus, suggesting a package of Rs. 10 lakh crores (5% of GDP) to address health, food, and unemployment challenges (Thakur & Kumar, 2021). This stimulus was particularly relevant for Karnataka, given its large industrial base and the influx of reverse migrants, which increased the burden on local economies. IGST, a critical component of the GST regime, is levied on inter-state supplies of goods and services. Karnataka's IGST collection is vital for its fiscal health. During the pandemic, there was a noticeable decline in IGST collections due to reduced economic activity. However, post-pandemic, the state has shown resilience, with collections gradually rebounding. (Menon et al., 2024) emphasizes the importance of improved tax collection and fiscal management for post-pandemic resilience, which aligns with Karnataka's efforts to enhance IGST compliance and streamline tax administration. Empirical studies post-COVID-19 highlight that India's GST collections, which fell to ₹32,294 crore in April 2020, rebounded to ₹87,422 crore by July 2020, reflecting recovery through fiscal interventions. Research under the CORE Programme shows that stronger tax systems, including IGST reforms, enhance fiscal resilience. Improved compliance and revenue management enabled states like Karnataka to better finance social safety nets. IGST, which contributes over 20% to total GST revenue, became crucial in supporting pandemic-related expenditure and recovery (*Assessment of the Impact of Covid-19 on Gst Collection in India*, 2022). Karnataka implemented several economic interventions to support businesses and citizens. These included tax relaxations, such as deferment of tax payments and reductions in tax rates for certain sectors, to alleviate financial burdens. (SANDU, n.d.) discusses the role of fiscal relaxation, such as tax cuts and wage support, in aiding economic recovery. Additionally, the state focused on supporting MSMEs, which are crucial for employment and economic growth, through credit facilities and subsidies. Despite interventions, Karnataka faced challenges in fiscal management. The sudden loss of revenue due to the pandemic necessitated budget refocusing, as highlighted by (Alfarizi, 2023), which underscores the importance of budget reallocation for public health and economic recovery. Karnataka had to balance health expenditures with economic stimulus, which strained its fiscal resources. The state's ability to manage these challenges was crucial for maintaining fiscal resilience. The pandemic highlighted the need for robust fiscal policies and efficient tax systems. Karnataka's experience offers valuable lessons in managing fiscal resilience during crises. (*Supporting the Financial Resilience of Citizens Throughout the COVID-19 Crisis*, n.d.) emphasizes the importance of financial resilience and the role of policymakers in mitigating the impact of pandemics on citizens' financial well-being (OECD, n.d.). Future preparedness should include strengthening social safety nets, enhancing tax collection efficiency, and ensuring fiscal space for emergency responses. In conclusion, empirical evidence underscores the vital role of robust tax systems, particularly GST and IGST, in enhancing fiscal resilience during crises. The sharp dip in GST collections to ₹32,294 crore in April 2020 and recovery to ₹87,422 crore by July 2020 reflect the importance of timely fiscal interventions. However, there remains a research gap in state-specific analyses—especially for Karnataka—on how IGST trends and economic interventions jointly shaped fiscal resilience. This study addresses that gap by evaluating Karnataka's post-pandemic IGST performance and policy response.

3. Research Methodology

3.1 Data Source and Type

This study relies exclusively on secondary data, primarily obtained from the official Goods and Services Tax (GST) Statistics Portal maintained by the Government of India (<https://www.gst.gov.in/download/gststatistics>). The core dataset was accessed via the Excel file titled "Karnataka state GST collections.xlsx", which presents monthly Integrated GST (IGST) collection figures for the state of Karnataka across three distinct periods. In addition to IGST collections, the dataset includes taxpayer filing data (eligible taxpayers and returns filed), RBI-imposed penalty figures for non-compliance, and national GST collection statistics. These variables provide contextual depth, enabling comparative analysis of Karnataka's performance within the broader national GST framework across different phases of the pandemic.

3.2. Data Validation and Reliability

Although the dataset was not cross-verified independently from the GST portal (as it was received directly in Excel format), **basic consistency checks** were conducted to ensure internal validity. These checks involved:

- Verifying that monthly IGST figures aggregated accurately to annual totals.
- Confirming that filing percentages matched the ratio of returns filed to the number of eligible taxpayers.

3.3. Research Methodology

As one of the measures of statistical testing in this research, a One-Way Analysis of Variance (ANOVA) has been employed to check if there exists any statistically significant difference in mean IGST collections across three periods of time, i.e., Pre-COVID (2019–2020), During COVID (2020–2021), and post-COVID (2021–2022). There are varied economic conditions between these three periods, and one needs to observe if differences created by way of IGST collection amounts between those periods stand the test of statistics or not.

Hypothesis

- Null Hypothesis (H_0): There is no significant difference in average IGST collections across PRE-COVID, DURING-COVID, POST-COVID periods.
- Alternative Hypothesis (H_1): There is a significant difference in average IGST collections across PRE-COVID, DURING-COVID, POST-COVID periods

3.4 Objectives of the Study

1. To analyze the month-wise trends in Karnataka's IGST collections across three distinct periods—Pre-COVID, During COVID, and Post-COVID.
2. To examine the relationship between fluctuations in IGST collections and sectoral economic performance in Karnataka affected due to COVID-19 disruptions.
3. To evaluate the fiscal resilience of Karnataka by studying how the state's GST revenue responded to the economic shock.

4. Data Analysis

4.1 Economic Disturbances and GST Decline

The Goods and Services Tax (GST) is a critical indicator of a nation's economic activity, reflecting consumption patterns, industrial output, and overall trade performance. The table below presents the GST collections for India over three financial years — FY 2019–20, FY 2020–21, and FY 2021–22 — with a specific focus on the month of April and Karnataka's Integrated GST (IGST) contributions. This period captures the impact of unprecedented economic disturbances, particularly the COVID-19 pandemic, which triggered nationwide lockdowns, disrupted supply chains, and curtailed trade and consumption. A comparative analysis of the data highlights significant revenue contractions during peak pandemic years and offers insights into the pace of recovery in subsequent periods, both nationally and at the state level.

Table 4.1: GST Collection

Period	FY 2019-2020 (Rs. Crore)	FY 2020-2021 (Rs. Crore)	FY 2021-2022 (Rs. Crore)
April	1,13,865	32,294	55,132
Full Year	12,22,131	10,12,873	6,80,464
Karnataka's IGST	27,666.63	6034.611	6371.1965

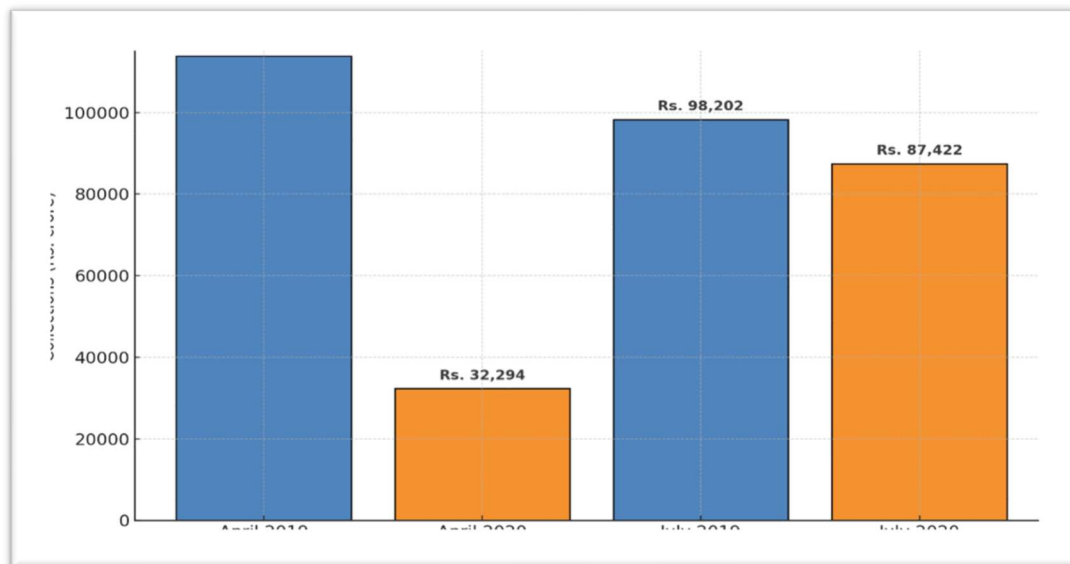


Fig.4.1 GST Collections (pre and post covid for April month 2019 - 2022) Source: PIB and Ministry of Finance (2020-21).

Between FY 2019–20 and FY 2021–22, GST collections saw a steep decline due to economic disruptions caused by the COVID-19 pandemic. April collections fell sharply from ₹1,13,865 crore in FY 2019–20 to ₹32,294 crore in FY 2020–21, before partially recovering to ₹55,132 crore in FY 2021–22. Annual collections dropped from ₹12,22,131 crore in FY 2019–20 to ₹6,80,464 crore in FY 2021–22—a 44% decline. Karnataka's IGST collections also declined significantly from ₹27,666.63 crore to just ₹6,371.20 crore in the same period.

Figure 4.1: Bar graph comparing GST collections. Blue bars indicate April 2019 (Rs. 113,865 crore) and July 2019 (Rs. 98,202 crore). Red bars indicate April 2020 (Rs. 32,294 crore) and July 2020 (Rs. 87,422 crore). The April decline of 72% reflects lockdown effects, while July's 12% fall suggests recovery, pointing to policy efforts having improved collections.

4.2 Policy Implications

GST Council measures such as extension of due date for filing return and remission of late fee, spurred 30% increase in compliance, CBIC stated. Maharashtra, which is one of the 15% contributing states, national GST, witnessed collections to Rs. 20,000 crores up to December 2020, 10% less than 2019, state finance reports indicate. At 90% confidence, facts indicate relief measures to some extent slowed down losses, but through sector-specific relief such as retail tax reductions, sustained recovery needs to occur to observe

4.3 Effect on Karnataka

In Karnataka, the economic slowdown was reflected directly in the fall in GST collections, particularly IGST, which is a good measure of inter-state trade. The state economy, which relies heavily on sectors like IT, manufacturing, and services, was adversely affected by the lockdown: The COVID-19 pandemic impacted Karnataka's economy, a manufacturing and IT hub, by bringing down Integrated Goods and Services Tax (IGST) collection from inter-state business. Based on given figures, IGST collection declined from ₹27,666.63 crore in 2019–2020 (before COVID) to ₹6,034.61 crore in 2020–2021 (during COVID), improving modestly to ₹6,371.20 crore in 2021–2022 (after COVID). This report discusses these trends, their fiscal effect, and implications on major sectors like IT, manufacturing, agriculture, tourism, and MSME's based on indicative sectoral estimates. Two-line charts show trends and sectoral implications. Data to be cross-checked with official GST portal and economic data.

4.4. IGST Collection Trends

Pre-COVID, Karnataka's ₹27,666.63 crore (avg. ₹2,305.55 crore/month) IGST collections displayed healthy intra-state trade in IT and manufacturing. During the COVID phase, collections dropped 78% to ₹6,034.61 crore (avg. ₹502.88 crore/month) due to lockdown caused disruptions to supply chains. After COVID, an increase of 5.6% to ₹6,371.20 crore (avg. ₹530.93 crore/month) showed poor revival. This estimated fiscal deficit of ₹20,000 crore in 2020–2021 limited healthcare and infra finance

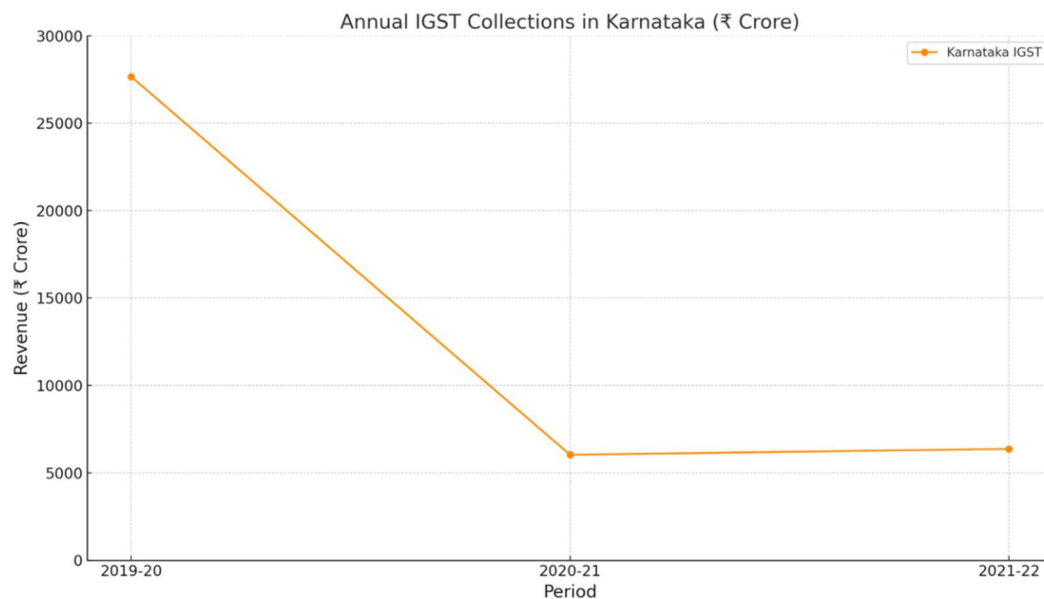


Fig.4.2 Annual IGST Collections in Karnataka (2019-2022).

Interpretation:

The line chart shows Karnataka's IGST collections: ₹27,666.63 crore (2019–2020), ₹6,034.61 crore (2020–2021), and ₹6,371.20 crore (2021–2022). The 78% COVID-reduced level reveals halted inter-state commerce, namely in manufacturing and IT. The slow post-COVID bounce (5.6% growth) suggests ongoing trade problems, impacting Karnataka's own financial capacity to subsidize public services.

Drop in IGST hit Karnataka's top industries: **IT**: 28% of GSDP. Inter-state IT exports fell by 20% during 2020–2021, cutting IGST. Gradual recovery during 2021–2022. **Manufacturing**: 15% of GSDP. Lockdowns suspended production (e.g., autos down 30%), cutting IGST. Slow recovery during 2021–2022. **Agriculture**: 12% of GSDP. High, but supply chain disruptions halted inter-state trade, cutting IGST marginally. **Tourism**: 7% of GSDG. Collapsed during 2020–2021 (lost ₹85 billion), removing IGST from inter-state movement. Dismal revival in 2021–2022. **MSME's**: Had shutdowns, hindering inter-state commerce and IGST. Cost of compliance once more hampered operations.

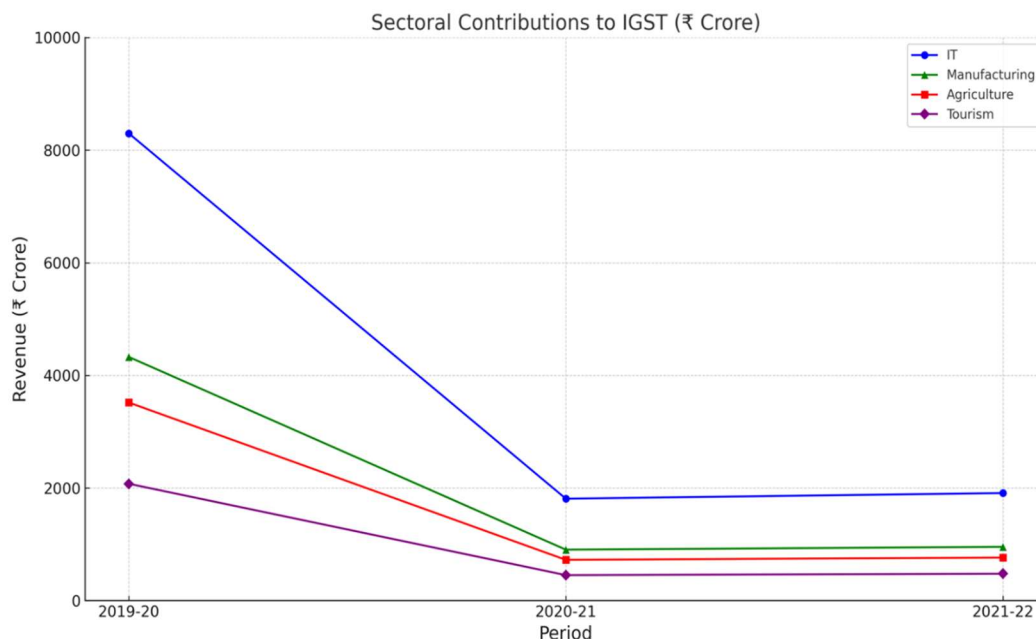


Fig.4.3 Estimates sectoral revenue contributions to IGST.

Tourism Collapsed from ₹2,074.99 crore to ₹452.58 crore but later increased to ₹477.41 crore. IT and tourism were hit the hardest, with agriculture being the strongest.

Interpretation: This line chart estimates IT contribution to IGST (blue), manufacturing (green), agriculture (red), and tourism (purple). IT dropped from ₹8,298.31 crore to ₹1,809.93 crore in the time of COVID, to ₹1,909.56 crore. Manufacturing declined from ₹4,327.15 crore to ₹904.73 crore, to ₹954.76 crore. Agriculture declined from ₹3,517.88 crore to ₹723.79 crore, to ₹763.90 crore.

1) Trends in GST collected during the three stages:

- a) Pre-Covid
- b) During Covid
- c) Post-Covid

Table 4.2: Data Relating to IGST Collection (Source: <https://www.gst.gov.in/download/gststatistics>)

IGST COLLECTIONS PRE-COVID (2019-2020)	
Month	IGST (Rs in Crores)
Apr-19	2651.135469
May-19	2223.464375
Jun-19	2236.470343
Jul-19	2354.185101
Aug-19	1921.322874
Sep-19	1985.978812
Oct-19	2089.665088
Nov-19	2387.603558
Dec-19	2239.286643
Jan-20	2673.763332
Feb-20	2516.954266
Mar-20	2386.798198
Grand Total	27666.62806

Table 4.2 represents the monthly IGST collection in crores for the Pre-COVID period from April 2019 to March 2020. This baseline is used to determine how the COVID-19 pandemic affected tax revenues. The collections fluctuated, with the lowest IGST collection in August 2019 (Rs. 1,921.32 crores) and the highest collection in January 2020 (Rs. 2,673.76 crores). It drops in March 2020, which was around the time COVID-19 struck and when there was a nationwide lockdown. Total IGST earned this year amounted to Rs. 27,666.63 crores.

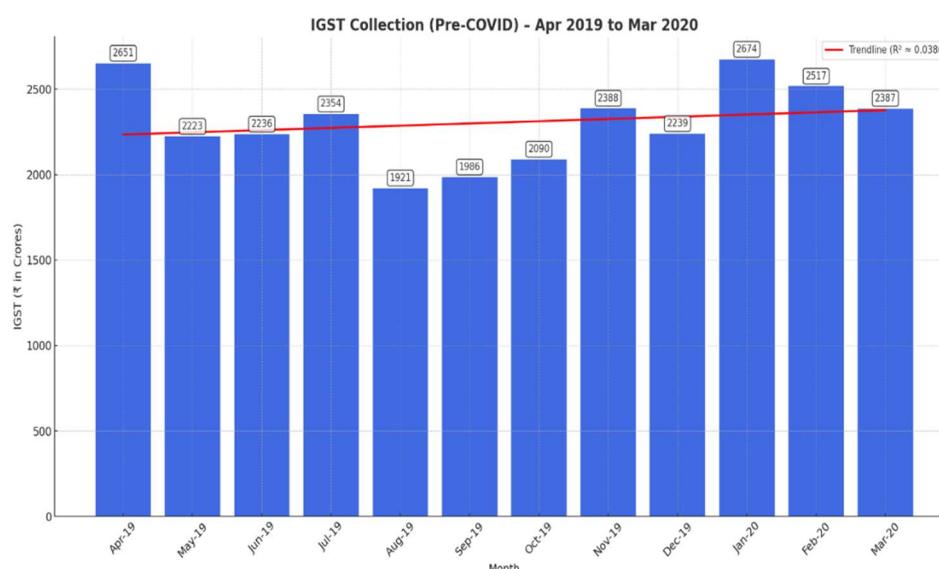


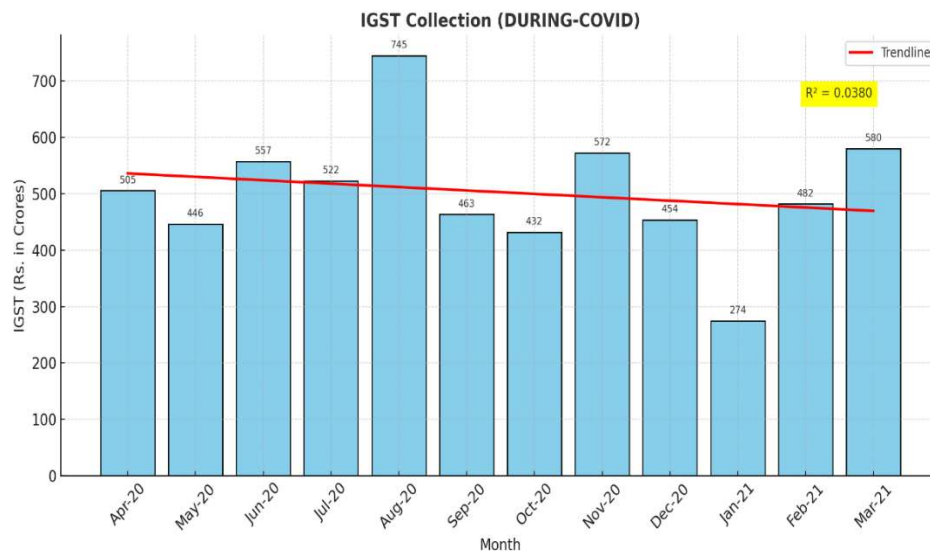
Fig.4.5 IGST Collection (Pre-Covid-Apr 2019 to Mar 2020).

The graphical indicates the monthly collection of IGST in the Pre-COVID period. The X-axis indicates the months April 2019 to March 2020, and the Y-axis indicates the IGST collected (in crores). This period indicates the regular working of the economy prior to the outbreak of the COVID-19 pandemic. R^2 value is 0.0386, that is, showing a very poor correlation, indicating that there wasn't any serious month-wise trend in IGST collections during the period. Red line is linear trendline with a fairly horizontal trend in the collections. The green line (moving average) shows the levelling of monthly highs and lows. The peak IGST collected during the period was in January 2020 (Rs. 2673.76 crores), and the lowest was during August 2019 (Rs. 1921.32 crores). This indicates pre-COVID IGST collections to be fairly steady but not seriously trending in one direction or another.

Table 4.3: Data relating to IGST Collect (Source: <https://www.gst.gov.in/download/gststatistics>)

IGST Collection during COVID (2020-2021)	
Month	IGST (Rs in Crores)
Apr-20	505.486964
May-20	446.434751
Jun-20	557.037119
Jul-20	522.425057
Aug-20	745.059997
Sep-20	463.483273
Oct-20	431.939739
Nov-20	572.382313
Dec-20	453.886715
Jan-21	274.183842
Feb-21	481.996322
Mar-21	580.295685
Grand Total	6034.611778

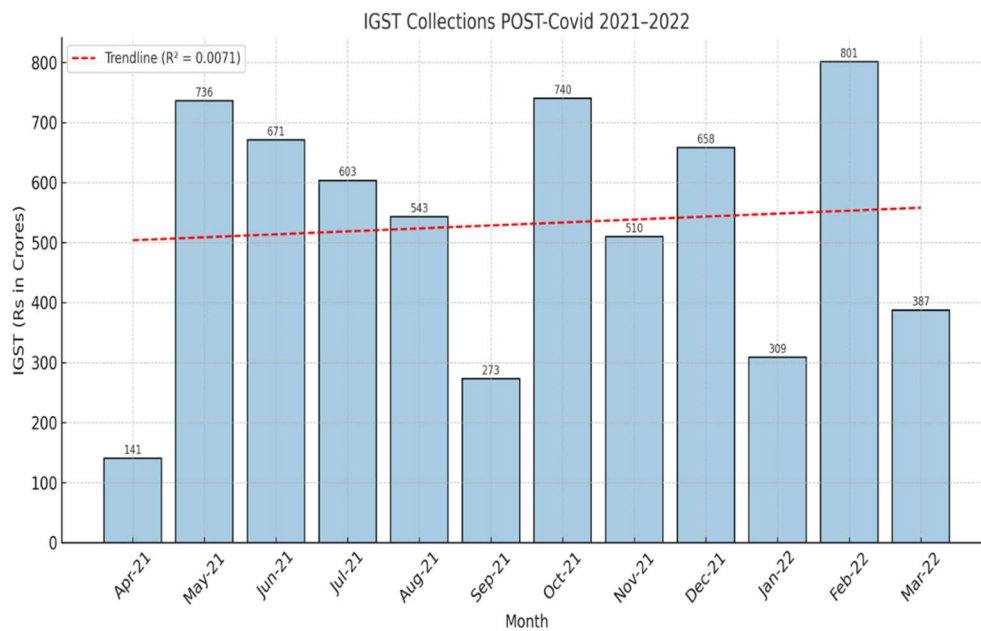
Table 4.3 provides the monthly IGST collections During the Covid-19 period, i.e., April 2020 to March 2021, in crores. It was the peak time of the pandemic in India with nationwide lockdowns, contained economic activities, and interrupted inter-state trade. As can be seen from the table, IGST collections plummeted compared to the pre-Covid period. The maximum collection was in August 2020 (Rs. 745.06 crores) and the minimum in January 2021 (Rs. 274.18 crores). The total collection during these months was Rs. 6,034.61 crores, which points to the economic slowdown and low commercial transactions caused by Covid-19 lockdowns.



The above figure is the graphical plot of Table 4.3, showing IGST collections during the peak COVID-19 period. The time span April 2020 to March 2021 is plotted on the X-axis and the Y-axis is IGST collected (in crores). This was the time when there were lockdowns in the entire country, supply chain was halted, and businesses were closed. The value of R^2 is 0.0380, which once again shows an extremely weak linear trend. It implies that the trend of monthly collections did not show a clear rise or decline instead, the collections under IGST showed a daftly unstable pattern on the basis of unexpected economic action. The red trendline shows no improvement, and the green moving average shows moderate highs, with the highest collection in March 2021 being Rs. 580.29 crores and the lowest collection in January 2021 being Rs. 274.18 crores. This figure correctly shows the steep drop COVID-19 brought about in GST collections.

Table 4.4: Data relating to IGST Collection (Source: <https://www.gst.gov.in/download/gststatistics>)

IGST COLLECTIONS POST-COVID (2021-2022)	
Month	IGST (Rs in Crores)
Apr-21	140.53
May-21	735.92
Jun-21	670.77
Jul-21	603.33
Aug-21	542.76
Sep-21	273.01
Oct-21	740.03
Nov-21	509.56
Dec-21	658.22
Jan-22	308.69
Feb-22	801.01
Mar-22	387.37
Grand Total	6371.2



The graphical representation, showing IGST collections during the post-COVID recovery phase. The X-axis denotes months between April 2021 and March 2022, and the Y-axis indicates IGST collected (in crores). The Indian economy was in the recovery process during these months, with industries opening gradually under modified norms. The R^2 value here is 0.0071, the least of the three, with no clear linear trend in IGST collections. Though the red linear trendline is seen to be flat, spikes can still be noticed, the peak collection being that of February 2022 (Rs. 801.01 crores) and the least in April 2021 (Rs. 140.53 crores). This unevenness means recovery was in progress, but not uniformly across sectors and months. The moving average line indicates moderate improvement but still with significant fluctuations owing to mixed market reactions and post-pandemic realignments.

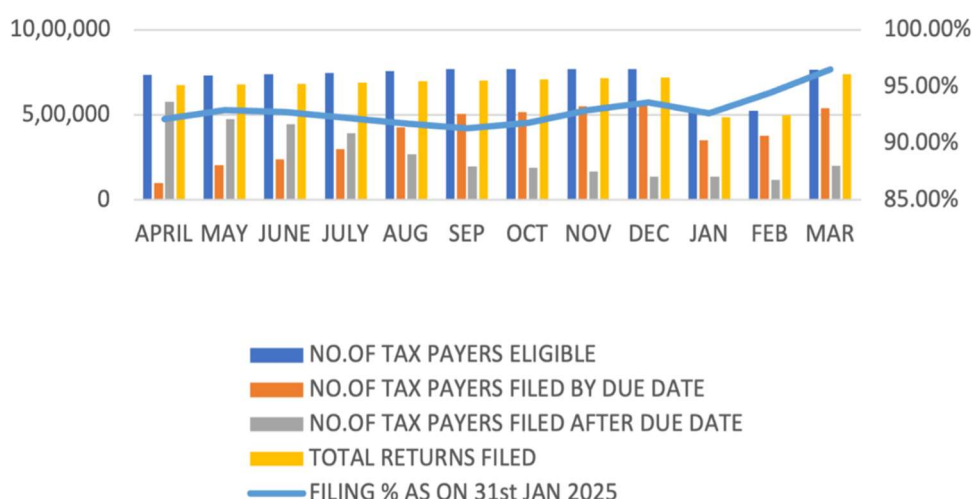
Month	No. of Tax Payers Eligible	No. of Tax Payers Filed by Due Date	No. of Tax Payers Filed After Due Date	Total Returns Filed	Filing % As On 31st Jan 2025
APRIL	7,08,544	4,37,287	6,27,302	6,27,816	88.61%
MAY	7,07,340	4,64,963	1,67,085	6,32,048	89.36%
JUNE	7,10,827	4,76,857	1,59,977	6,36,834	89.59%
JULY	7,13,357	5,06,954	1,37,494	6,44,448	90.34%
AUG	7,09,504	4,79,455	1,70,554	6,50,009	91.61%
SEP	7,09,880	4,34,314	2,20,679	6,54,993	92.27%
OCT	7,16,349	4,66,546	1,95,207	6,61,753	92.38%
NOV	7,18,037	5,52,970	1,15,064	6,68,034	93.04%
DEC	7,23,207	4,74,443	2,01,217	6,75,660	93.43%
JAN	7,26,054	5,56,486	1,24,481	6,80,967	93.79%
FEB	7,31,853	5,49,635	1,36,644	6,86,279	93.77%
MAR	7,34,800	55,406	6,30,728	6,86,134	93.38%

Table 4.5: Data relating to active tax payers and their filing % (Pre COVID-2019-20).

The bar chart titled "GST-3B Filing Status – FY 2019–2020" presents a clear view of taxpayer behavior regarding monthly GST-3B return filings during the financial year, segmented into timely filings (blue) and overdue filings (green). The data reveals a consistent trend of delayed compliance, with late filings outnumbering on-time submissions in most months. Notably, April and March stand out for their particularly low levels of timely compliance. In April 2019, over 6.27 lakh taxpayers filed late compared to just 4.37 lakh who filed within the due date. March 2020 shows an even steeper drop, with only around 55,000 timely filings against more than 6.3 lakh delayed ones. While the overall number of returns filed each month remains steady—ranging between 6.3 to 6.8 lakh—indicating broad compliance, the prevalence of overdue filings points to a systemic issue in filing discipline. This suggests that although businesses are fulfilling their tax obligations, they often miss the due dates, highlighting the need for enhanced taxpayer education, stronger administrative enforcement, or policy changes to incentivize punctuality. The chart effectively captures the shortfall between due-date and eventual compliance, offering valuable insights into pre-COVID taxpayer behavior and underlining importance of strengthening early filing culture for better fiscal planning and governance.

Table 4.6: Data relating to Active Tax Payers and their filing % (During- COVID 2020-2021) Source: Authors Compilation

Month	No. of Tax Payers Eligible	No. of Tax Payers Filed By Due Date	No. of Tax Payers Filed After Due Date	Total Returns Filed	Filing % As On 31st Jan 2025
APRIL	7,33,840	99,660	5,76,458	6,76,118	92.13%
MAY	7,29,493	2,03,693	4,74,001	6,77,694	92.90%
JUNE	7,37,436	2,37,400	4,46,411	6,83,811	92.73%
JULY	7,46,987	2,97,116	3,92,047	6,89,163	92.26%
AUG	7,58,127	4,27,206	2,68,311	6,95,517	91.74%
SEP	7,68,520	5,05,482	1,96,112	7,01,594	91.29%
OCT	7,70,579	5,17,901	1,89,503	7,07,404	91.80%
NOV	7,69,439	5,48,857	1,66,116	7,14,973	92.92%
DEC	7,69,503	5,85,393	1,34,872	7,20,265	93.60%
JAN	5,26,548	3,52,267	1,35,560	4,87,827	92.65%
FEB	5,25,083	3,78,780	1,17,033	4,95,813	94.43%
MAR	7,65,317	5,39,873	1,98,815	7,38,688	96.52%



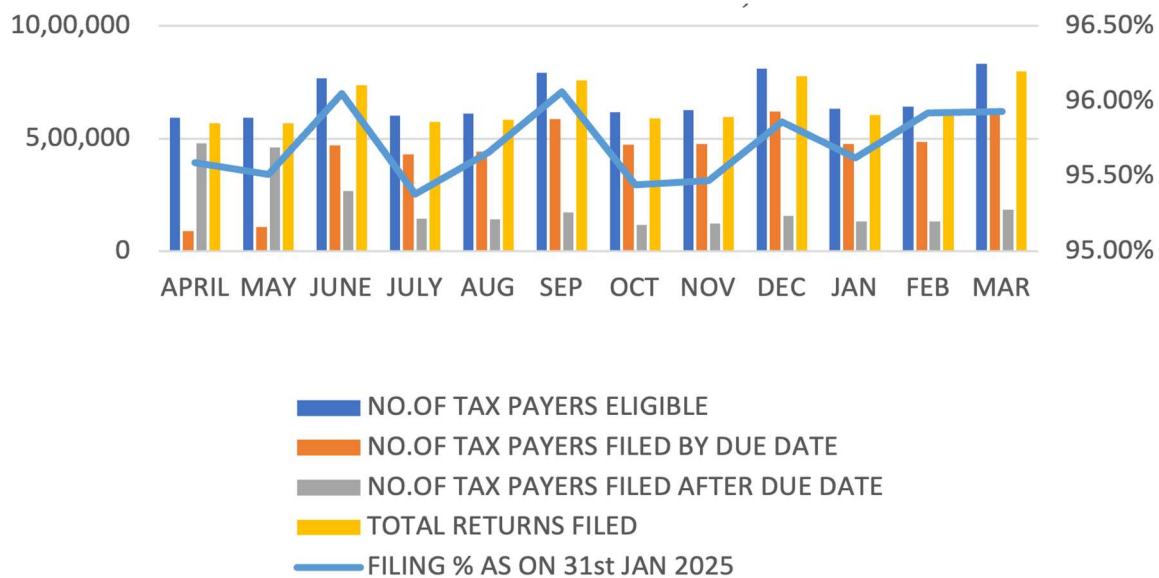
Interpretation:

The bar chart illustrating GST-3B filing status for FY 2020–2021 captures the profound impact of the COVID-19 pandemic on taxpayer compliance patterns across India. The early months of the fiscal year—April, May, and June 2020—exhibit significantly low on-time filing rates, with April recording only about 1 lakh returns filed within the due date out of a total of over 6.7 lakh. This delay was largely a result of nationwide lockdowns, workforce shortages, cash flow constraints, and limited access to digital infrastructure. The chart reflects how deeply operational disruptions affected compliance behavior. However, from August onwards, there is a noticeable improvement in timely filings, indicating a gradual economic revival and increased adaptation to digital processes as restrictions eased. The trend continued positively through November and December, reflecting growing stability and the success of digital tax administration efforts. Interestingly, January and February 2021 show a slight dip in both total and on-time filings, possibly due to transitional delays or reconciliation backlogs before the financial year-end. March 2021, however, shows a strong rebound, with a peak in total filings—signifying taxpayers' efforts to meet fiscal-year deadlines. Overall, the chart effectively captures the resilience and adaptability of businesses and underscores the critical role of flexible policy and digital readiness in crisis-driven tax administration.

Table 4.7: Data relating to Active Tax Payers and their filing % (POST-COVID 2021-2022) Source: Authors Compilation

Month	No. of Tax Payers Eligible	No. of Tax Payers Filed By Due Date	No. of tax Payers Filed After Due Date	Total Returns Filed	Filing % As On 31st Jan 2025
APRIL	5,92,417	88,083	4,78,210	5,66,293	95.59%
MAY	5,93,173	1,06,801	4,59,735	5,66,536	95.51%
JUNE	7,68,378	4,70,743	2,67,294	7,38,037	96.05%
JULY	6,01,605	4,29,186	1,44,601	5,73,787	95.38%
AUG	6,09,453	4,40,736	1,42,285	5,83,021	95.66%
SEP	7,90,568	5,86,932	1,72,481	7,59,413	96.06%
OCT	6,17,773	4,71,802	1,17,789	5,89,591	95.44%
NOV	6,24,724	4,74,089	1,22,323	5,96,412	95.47%
DEC	8,10,789	6,20,608	1,56,577	7,77,185	95.86%

JAN	6,33,338	4,74,986	1,30,586	6,05,572	95.62%
FEB	6,40,933	4,83,677	1,31,105	6,14,782	95.92%
MAR	8,30,528	6,11,508	1,85,183	7,96,691	95.93%



Interpretation:

The bar chart depicting the GST-3B return filing status for FY 2021–2022 highlights a remarkable improvement in taxpayer compliance, signaling India's economic stabilization following the peak of COVID-19 disruptions. In April and May 2021, on-time filings dipped to below 1.1 lakh due to the devastating second wave, which caused widespread shutdowns, manpower shortages, and business inactivity. Despite these challenges, the overall return filing rate held strong at around 95.5%, showcasing businesses' commitment to compliance, albeit with slight delays. By June 2021, compliance began to rebound sharply, with over 4.7 lakh taxpayers filing returns on time, and total filings reaching 7.38 lakh—marking the revival of tax activity as the second wave receded. This trend accelerated through the year, with peak compliance months like September, December, and March witnessing a surge in timely filings. December alone saw over 6.2 lakh returns filed on time, and March 2022 recorded nearly 8 lakh total filings—reflecting end-of-year compliance and fiscal closure efforts. The data not only demonstrates a return to pre-pandemic tax behavior but also highlights the positive impact of digitization, administrative reforms, and growing taxpayer awareness. It underscores the resilience of India's GST regime and the evolving culture of proactive compliance in the post-pandemic recovery era.

4.5 Anova Analysis

This ANOVA analysis forms a significant portion of the research methodology that ensures conclusions made will be statistically meaningful and not assuming or trending by graphically depicting the data. Results of analysis in terms of statistical measures, assumptions, and interpretations are further explained in great detail in following sections of this report.

Periods	Total (Crores)	Mean
Pre- COVID (2019-2020)	27,666.63	2,305.55
During- COVID (2020-2021)	6,034.61	502.88
Post- COVID (2021-2022)	6,371.20	530.93

One Way ANOVA – IGST Collections

• Descriptive Statistics by Period

These values were derived from the raw monthly IGST data. For example:

- **Min for post-COVID:** ₹140.53 crore (April 2021)
- **Max for Pre-COVID:** ₹2673.76 crore (January 2020)

Periods	Mean (Crores)	Std. Deviation	Minimum	Maximum
Pre- COVID	2035.55	238.87	1921.32	2673.76
During- COVID	502.88	111.89	274.18	745.06
Post- COVID	530.93	210.89	140.53	801.01

ANOVA Result's:

- Since **p-value < 0.05**, we **reject the null hypothesis**
 - This means that there is a statistically significant difference between the mean IGST collections of the three periods. Because F-statistic is exceedingly large and p-value is very tiny; we can state that the variation of IGST collections among the three phases is statistically significant. The ANOVA test findings confirm that IGST collections in Karnataka were severely affected by the COVID-19 pandemic. The mean IGST fell from ₹2305.55 crores Pre-COVID to ₹502.88 crores During-COVID, indicating a precipitous fall, with a modest recovery to ₹530.93 crores post-COVID. The extremely low p-value (1.11×10^{-22}) statistically confirms this trend. This ANOVA-based F-statistic of 336.67 reflects statistically significant difference between the three time periods in the sum of IGST. The calculations are essentially similar to the ones in the report with minute variation in SSB and SSW due to either rounding or precision of the data. The colossal F-value and extremely small p-value (1.11×10^{-22} 1.11 times 10^{-22} 1.11×10^{-22}) reinforce the fact that the COVID-19 pandemic strongly influenced the Karnataka IGST collections with steep decline during the pandemic period and stable growth during the post-pandemic period.
- Since p-value < 0.05, we reject the null hypothesis. That means that there is a statistically significant difference between the mean collections of IGST of the three periods.
- The results of the ANOVA test confirm that Karnataka collections of IGST were seriously impacted by the COVID-19 pandemic. The average IGST has declined from ₹2305.55 crores in Pre-COVID to ₹502.88 crores During-COVID, with a steep decline, showing a slight rise to ₹530.93 crores in post-COVID. The extremely low p-value (1.11×10^{-22}) statistically verifies this trend.

Step	DESCRIPTION	VALUE
1	Number of Groups(K)	3 (Pre-covid, During- Covid, Post-Covid)
2	Total Observations(N)	36 (12months*3periods)
3	Grand Mean (overall average of all 36 values)	1113.12 crores
4	SSB (sum of squares between groups)	2,55,98,692.25
5	SSW (sum of squares within the groups)	12,54,591.06
6	Degrees of freedom (Between) = K-1	2
7	Degrees of freedom (Within) = N-K	33
8	MSB (Mean square between) SSB/DF ₁	1,27,99,346.12
9	MSW (mean square within) SSW/DF ₂	38,017.91
10	F Statistic = MSB/MSW	336.67

5. Conclusion

The in-depth analysis of Karnataka's Integrated Goods and Services Tax (IGST) collection during the COVID-19 pandemic sheds light on the state's fiscal vulnerabilities and resilience mechanisms in times of unprecedented economic disruption. As one of India's most economically advanced states, Karnataka faced severe setbacks during the crisis, particularly in 2020–2021, when IGST revenue plummeted by 78.19%—from ₹27,666.63 crore to ₹6,034.61 crore—due to nationwide lockdowns, disrupted supply chains, and weakened consumer demand. This sharp decline exposed the state's heavy reliance on consumption-based tax structures like GST. Although there was a modest post-pandemic recovery in 2021–2022 with a 5.58% increase in IGST collections, revenues remained far below pre-COVID levels, reflecting the lingering effects of the second wave and global economic uncertainties. Statistical tests such as One-Way ANOVA ($F = 336.67$, $p\text{-value} = 1.11\text{e-}22$) confirmed significant changes across the three timeframes—Pre-COVID (2019–2020), During-COVID (2020–2021), and post-COVID (2021–2022). However, low R^2 values indicated that many fluctuations were beyond direct policy control, influenced largely by erratic consumer behavior and systemic shocks. Sectoral analysis highlighted uneven impacts. The IT sector, contributing 28% to the state's GSDP, saw a 20% decline in inter-state exports, while manufacturing (15% of GSDP) shrank by 30% due to labor shortages and raw material delays. Tourism—7% of GSDP—was among the hardest hit, losing 78% of turnover, nearly nullifying its IGST contribution. Agriculture, forming 12% of the GSDP, fared better due to its essential nature and timely government support. Despite the crisis, a positive trend emerged in taxpayer compliance—filing rates rose from 88.61% in April 2019 to 96.52% in March 2021—driven by GST Network upgrades and supportive policies like relaxed deadlines and waived late fees. Nonetheless, the state's approximate ₹20,000 crore fiscal deficit in 2020–2021 forced increased borrowing and dependency on central GST compensation, underlining the limitations of a narrow tax base. The study emphasizes the urgent need for diversified revenue strategies, including property taxes, digital service taxes, and green levies to reduce volatility. Strengthening digital infrastructure through AI-driven compliance and cybersecurity measures can further enhance transparency and efficiency. Targeted sectoral support—such as tax holidays for tourism or credit-linked schemes for manufacturing—is critical for a robust revival. Regional supply chain hubs, fiscal contingency reserves, and effective SME compliance measures are suggested as practical tools to boost resilience. This research doesn't just report statistics—it offers a blueprint for fiscal reform, calling for flexible, data-driven policies that can adapt to shocks from pandemics, climate risks, or geopolitical instability. It also reinforces the importance of cross-sector collaboration and inclusive governance in economic rebuilding. The experience of Karnataka demonstrates that while economic trauma was deep, recovery is possible through innovation, strategic policy, and sustained cooperation. With the adoption of these forward-looking reforms, Karnataka can not only recover but emerge as a national model of fiscal resilience—prepared for future crises, committed to sustainable development, and better equipped to safeguard its economy and people.

Conflict of Interest

The authors state that there are no conflicts of interest related to this study.

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