



## **BANK CREDIT GROWTH AND GST REVENUE DYNAMICS IN INDIA:**

### **EVIDENCE FROM AN ARDL BOUNDS TESTING APPROACH**

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#### **Abstract**

This study examines the dynamic relationship between bank credit boom and items and services Tax (GST) sales boom in India the use of month-to-month information from August 2017 to December 2025. Employing the Autoregressive distributed Lag (ARDL) modelling framework and boundaries trying out technique, the analysis investigates each the lengthy-run equilibrium relationship and brief-run adjustment dynamics between financial intermediation and indirect tax overall performance.

The limits test exhibits sturdy evidence of cointegration, confirming the lifestyles of a stable long-run association among bank credit growth and GST revenue growth.

The fast-run estimates indicate that bank credit growth exerts a fantastic and statistically tremendous effect on GST revenue increase, with a 1 percent factor increase in credit score boom leading to an approximate 0.09 percentage point upward push in GST sales growth inside two months. The error correction time period is poor and tremendously good sized, implying speedy adjustment towards long-run equilibrium and reflecting the efficiency of India's GST machine.

The findings spotlight the crucial role of credit score-led financial activity in enhancing monetary overall performance and underscore the importance of coordinated monetary and



monetary regulations for strengthening sales mobilization and macroeconomic balance in emerging economies.

**Keywords:** *Financial Institution Credit Score Growth; GST Revenue Growth; ARDL Version; Bounds Testing; Error Correction Model; Financial–Financial Linkages.*

## 1. Introduction

The creation of the goods and services Tax (GST) in India in July 2017 represents one of the most significant monetary reforms undertaken for the reason that independence. by using subsuming a couple of significant and nation oblique taxes right into a unified, vacation spot-primarily based consumption tax, GST basically restructured India's indirect taxation framework with the objectives of improving tax efficiency, broadening the tax base, and enhancing revenue buoyancy (authorities of India, 2017). below the GST regime, tax collections have end up an increasing number of aware of real financial interest, economic intermediation, and transaction formalization, thereby strengthening the linkage between macroeconomic conditions and indirect tax performance (NIPFP, 2022; RBI, 2023).

Parallel to this institutional transformation, bank credit score growth has remained a important driving force of aggregate demand and monetary activity within the Indian economic system. growth in financial institution credit score helps funding, working capital financing, and family intake, all of which generate taxable transactions underneath the GST framework. therefore, fluctuations in credit availability are anticipated to have direct and indirect implications for GST revenue dynamics. periods of credit score growth normally stimulate production, alternate, and intake, leading to higher invoicing and tax collections, while credit contractions—inclusive of the ones found throughout the COVID-19 pandemic—can sharply suppress monetary activity and financial revenues.

Know-how the dynamic relationship between bank credit increase and GST revenue increase is therefore of good-sized importance for monetary planning, financial–economic coordination, and macroeconomic stabilization. in spite of the developing frame of literature analyzing GST overall performance, tax buoyancy, and compliance outcomes in India, empirical proof at the direct transmission of economic-sector traits—mainly bank credit increase—to GST revenue remains constrained. current studies largely cognizance on GST's impact on financial increase,



the function of digital payments in improving tax compliance, or the determinants of bank credit in isolation, without explicitly modelling the short-run and lengthy-run linkages between credit score enlargement and oblique tax performance.

This look at addresses this gap by means of examining the connection between bank credit boom and GST revenue boom in India the use of the Autoregressive disbursed Lag (ARDL) bounds trying out method. The ARDL framework is in particular suitable in this context due to its flexibility in managing variables included of blended orders, its robustness in small-sample settings, and its capacity to concurrently estimate brief-run dynamics and lengthy-run equilibrium relationships (Pesaran, Shin, & Smith, 2001; Narayan, 2005). Given the relatively short time span of India's GST regime and the presence of structural shocks inclusive of the COVID-19 pandemic, the ARDL technique offers the perfect econometric strategy for taking pictures each immediately responses and longer-time period modifications.

The usage of monthly facts from August 2017 to December 2025, this observe investigates whether or not bank credit boom exerts a statistically substantial have an impact on on GST revenue boom within the quick run and whether a solid long-run equilibrium relationship exists among the two variables. by means of incorporating an errors correction mechanism, the evaluation similarly assesses the rate at which deviations from long-run equilibrium are corrected, thereby shedding light on the responsiveness of India's GST system to monetary and macroeconomic shocks.

The findings of this study make contributions to the literature in several methods. First, they provide empirical proof on the function of credit score-led economic activity in shaping GST revenue dynamics in an emerging financial system. 2nd, they offer insights into the short-run transmission mechanisms thru which monetary situations have an effect on fiscal outcomes underneath a cutting-edge, technology-driven tax regime. in the end, the consequences deliver crucial coverage implications for monetary–monetary coordination, credit score coverage design, and sales management in India and different rising economies with comparable institutional frameworks.

## **2. Literature review**



The creation of the goods and offerings Tax (GST) in India has generated a good-sized frame of empirical work on how oblique tax sales reply to macroeconomic and financial tendencies. several studies have tested the effect of GST on tax sales, economic growth, and compliance, but especially few have systematically explored the position of economic-zone variables—mainly bank credit score boom—in shaping GST dynamics (authorities of India, 2017; NIPFP, 2022).

Paliwal (2020) analyses the impact of GST on tax sales the use of a tax buoyancy framework and reveals that GST has contributed to progressed sales mobilization via better compliance and a broader tax base. The look at highlights that indirect tax revenues, which include GST, are closely connected to the general increase of the economic system and the formalization of transactions, suggesting that monetary-zone indicators together with bank credit may also play a vital position in figuring out GST performance.

Rudrani and Agarwal (2021) study the macroeconomic influences of GST restructuring and change styles, showing that GST has altered the shape of tax collections and improved the performance of indirect taxation. Their findings indicate that GST revenue is sensitive to adjustments in exchange, industrial pastime, and consumption, reinforcing the need to study its interplay with financial-region indicators such as bank credit.

Garg (2024) investigates GST revenue efficiency and reveals that GST plays a distinguished role inside the very own-tax revenue of sub-country wide governments in India. The have a look at emphasizes the importance of institutional and virtual infrastructure in enhancing GST collections and decreasing revenue leakages, particularly within the context of credit-driven monetary hobby.

The boom of digital payments has emerged as a key issue influencing GST revenue. Joseph (2022) analyses the relationship among digital payments and tax revenue growth in India the use of an ARDL framework and unearths that virtual transactions have a high-quality and considerable effect on GST collections. The look at attributes this to improved transparency, decreased evasion, and higher monitoring of financial interest.



Likewise, Kumar (2024) examines the role of virtual bills in spurring GST sales and reviews that the expansion of virtual transactions has strengthened tax compliance and broadened the tax base. The findings advise that digitalization has made GST revenue greater conscious of financial pastime, particularly in the submit-pandemic length, whilst credit score-pushed recuperation performed a major position.

Furthermore, the relationship among financial institution credit boom and economic overall performance has been explored in several studies on rising economies. Ghosh and Sen (2023) examine the link between bank credit and financial results in India and find that credit growth has a advantageous effect on tax revenues, mainly thru its effect on funding and consumption. The take a look at highlights the significance of coordinated monetary and monetary rules for macroeconomic balance.

In a comparable vein, Kumar and Choudhary (2024) investigate the dynamics of credit score increase and tax revenue in India the use of time-collection strategies and record that bank credit score boom is a large driving force of oblique tax collections. Their findings suggest that credit-led monetary pastime complements the tax base and improves revenue buoyancy, specially under the GST regime.

Additionally, the Autoregressive disbursed Lag (ARDL) bounds-testing approach has been broadly used to examine lengthy-run relationships between tax revenue, economic increase, and economic-region variables. Pesaran, Shin, and Smith (2001) introduce the ARDL framework and reveal its suitability for small-pattern, mixed-order-of-integration settings. The method permits for simultaneous estimation of quick-run dynamics and long-run equilibrium relationships, making it best for analyzing the interplay between GST sales and bank credit score increase.

Likewise, Narayan (2005) applies the ARDL model to have a look at the saving-funding nexus in China and shows that the bounds-trying out approach is in particular beneficial for taking pictures cointegrating relationships in small samples. subsequent studies have extended this framework to examine tax revenue and financial growth in India (e.g., Mishra and Das, 2024), confirming the robustness of ARDL-based estimates in the Indian context.



Furthermore, latest work on financial institution credit score in India has additionally hired the ARDL technique. Singh (2025) examines the determinants of bank credit by way of commercial banks in India the usage of the ARDL bounds-checking out method and finds that credit score growth is prompted by macroeconomic and monetary variables, along with hobby quotes, GDP increase, and monetary development. The have a look at highlights the importance of ARDL in taking pictures both quick-run modifications and long-run equilibrium relationships in credit score markets.

Similarly, Pradhan (2025) analyses the effect of the banking zone on Indian financial increase using the ARDL bounds-checking out technique and reports that financial institution credit increase has a wonderful and widespread effect on GDP, reinforcing the function of credit-led activity in shaping macroeconomic effects.

### **3. Research Gap**

Notwithstanding a developing literature on GST revenue, digital payments, and bank credit score growth, there is confined empirical paintings that explicitly examines the dynamic relationship among bank credit boom and GST revenue increase in India the usage of a time-collection framework. maximum studies either focus on GST's effect on macroeconomic aggregates, the role of digitalization in tax compliance, or the determinants of bank credit score in isolation, without modelling the short-run and lengthy-run linkages between credit expansion and oblique tax performance.

This takes a look at fills this hole through using the Autoregressive dispensed Lag (ARDL) bounds-checking out approach to analyses the lengthy-run equilibrium and short-run adjustment dynamics among bank credit score increase and GST revenue growth in India. The findings make contributions to the literature by presenting proof on how credit score-led financial hobby affects GST collections and by using highlighting the significance of coordinated financial and financial policies for revenue mobilization and macroeconomic stability.

### **4. Research objective**



The research targets are categorized into number one and secondary targets to clearly distinguish the core analytical cognizance from the wider policy and interpretive objectives.

#### Primary goals

- To take a look at the stationarity and order of integration of financial institution credit score growth and GST revenue increase using unit root checks (ADF).
- To test for the life of a long-run cointegrating dating among bank credit score increase and GST sales growth the use of the ARDL bounds-testing method.
- To estimate the quick-run dynamic impact of financial institution credit growth on GST revenue growth through the ARDL version.
- To derive the long-run equilibrium coefficients and analyse the velocity of adjustment towards equilibrium through the error correction version (ECM).

#### Secondary objectives

- To interpret the empirical outcomes in the context of India's GST regime and credit score-pushed financial pastime.
- To assess the responsiveness of GST sales to macro-financial shocks and coverage-induced credit score growth.
- To offer policy suggestions on fiscal-financial coordination, credit score-coverage layout, and revenue management in rising economies, with specific connection with India.

## 5. Research Methodology

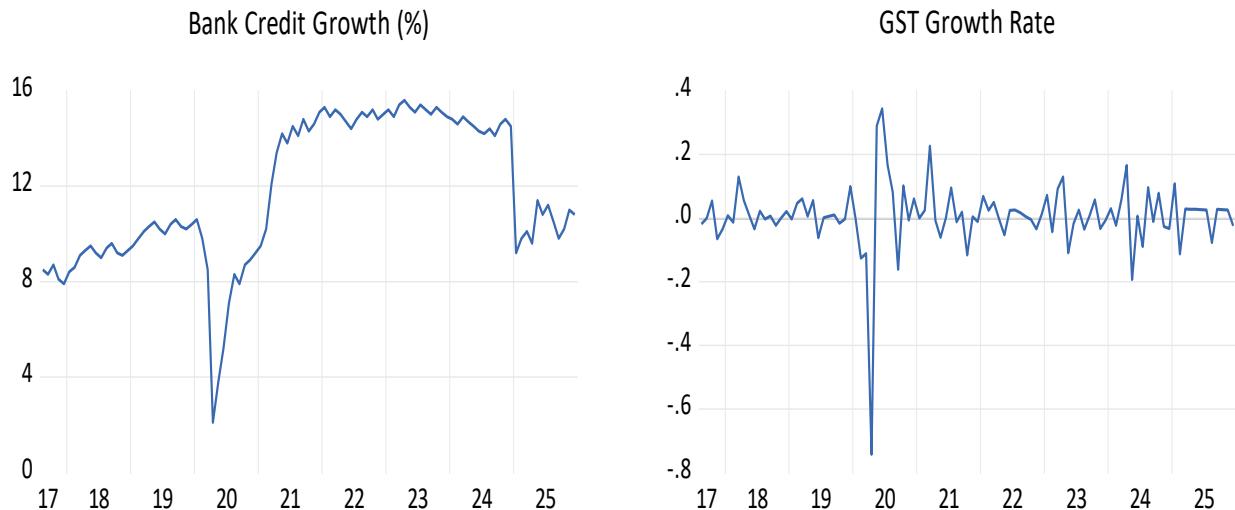
The present have a look at adopts a quantitative research layout based totally on time series econometric analysis to have a look at the dynamic courting among financial institution credit score increase and goods and services Tax (GST) revenue boom in India. monthly secondary statistics are analyzed the usage of the Autoregressive disbursed Lag (ARDL) bounds trying out method, which allows the examination of each brief-run dynamics and lengthy-run equilibrium relationships. The methodology employed is suitable given the combined order of integration of the variables and ensures strong and dependable empirical effects.



Component	Description
Research Design	Quantitative research using time series econometric analysis.
Data Type	Secondary data (monthly time series).
Study Period	August 2017 to December 2025 (101 observations).
Variables	Dependent Variable: GST Revenue Growth Independent Variable: Bank Credit Growth
Stationarity Test	Augmented Dickey–Fuller (ADF) unit root test.
Econometric Model	Autoregressive Distributed Lag (ARDL) model.

## 6. Data Analysis & Interpretation

The graphical representation of bank credit growth and GST revenue growth reveals important dynamic patterns over the study period.



Financial institution credit and GST sales growth show off clean co-motion over the study length. both collections show stable growth earlier than 2020, a sharp contraction at some stage in the COVID-19 surprise, and a sturdy recovery thereafter. bank credit score growth fell to historical lows in early 2020, whilst GST sales recorded a big terrible shock because of lockdown-triggered disruptions. From 2021 onward, each indicators recovered and stabilized, reflecting policy help, monetary normalization, and progressed compliance. This synchronized decline and healing visually supports a strong brief-run relationship and rapid adjustment between bank credit score growth and GST revenue overall performance.

### 6.1. Descriptive Statistics

	BANK_CREDIT	GST_GROWTH
Mean	11.72970	0.007407
Median	10.80000	0.005764
Maximum	15.60000	0.343467
Minimum	2.100000	-0.743052
Std. Dev.	3.028351	0.108637



Skewness	-0.420737	-2.817346
Kurtosis	2.568235	24.99595
Jarque-Bera	3.764347	2169.698
Probability	0.152259	0.000000
Observations	101	101

### Outcome

Financial institution credit score boom shows moderate volatility and near-ordinary distribution.

GST revenue growth suggests excessive volatility, terrible skewness, and non-regular distribution. The statistical contrast between the two variables famous vital structural traits of India's economy. bank credit score boom follows a relatively clean and coverage-guided trajectory, reflecting the stabilizing impact of financial regulation and banking supervision. In contrast, GST sales increase is surprisingly risky and touchy to macroeconomic shocks, which include disruptions in consumption, trade, and deliver chains. The presence of severe bad values highlights the vulnerability of oblique tax revenues at some stage in monetary downturns. This divergence justifies inspecting bank credit score boom as a capacity motive force and stabilizing pressure for GST sales dynamics.

## 7. Econometric Methodology and Empirical Result

### 7.1. Unit Root Test and Stationarity Analysis

**Table 1: ADF Unit Root Test Results**



Variable	Level (With Constant)	First Difference (With Constant)	Order of Integration
<b>GST_GROWTH</b>	-10.3091*** (0.0000)	-7.5622*** (0.0000)	I (0)
<b>BANK_CREDIT</b>	-1.8403 (0.3592)	-9.4271*** (0.0000)	I (1)

**Source:** Author's estimation.

Outcome

GST revenue increase is stationary at level.

Financial institution credit growth turns into stationary after first differencing.

GST revenue growth famous mean-reverting conduct, indicating speedy adjustment to financial fluctuations. bank credit boom, on the other hand, shows persistence and adjusts greater step by step over time. The blended order of integration satisfies the essential situation for making use of the ARDL bounds trying out method and confirms that alternative cointegration techniques might be less appropriate in this context.

## 7.2. ARDL Short-Run Estimation Results

The coefficients of the lagged based variable, GST\_GROWTH, are poor and significant across all four lags (-0.335, -0.269, -0.157, -0.197;  $p < 0.05$ ), indicating robust imply-reverting behavior. This shows that short-term deviations in GST sales increase are systematically corrected, reflecting the stabilizing role of India's GST machine supported by means of virtual compliance and institutional efficiency.

The contemporaneous coefficient of bank credit score growth is nice and extraordinarily good sized (0.0696,  $p = 0.0000$ ), implying that a 1% boom in credit boom increases GST sales growth through kind of 0.07 percent points in the brief run. Lagged credit increase coefficients are bad and great (-0.044, -0.024), showing that the preliminary stimulative effect moderates over time because of inventory changes, compensation cycles, and business normalization.

The version suits well, with  $R^2 = 0.544$  and  $F$ -statistic = 15.20 ( $p < 0.01$ ), indicating sturdy explanatory electricity and joint importance of the regressors.

**Table 2: ARDL (4,2) Model Estimates**

Variable	Coefficient	Std. Error	t-Statistic	Probability
GST_GROWTH (-1)	-0.3350***	0.0993	-3.3738	0.0011
GST_GROWTH (-2)	-0.2685***	0.0747	-3.5955	0.0005
GST_GROWTH (-3)	-0.1572**	0.0766	-2.0534	0.0430
GST_GROWTH (-4)	-0.1971**	0.0753	-2.6180	0.0104
BANK_CREDIT	0.0696***	0.0081	8.5999	0.0000
BANK_CREDIT (-1)	-0.0444***	0.0132	-3.3773	0.0011
BANK_CREDIT (-2)	-0.0235**	0.0106	-2.2145	0.0293
Constant (C)	-0.0076	0.0333	-0.2279	0.8202

**Source:** Author's estimation.

### 7.3. ARDL Bounds Test for Cointegration

**Table 3: Bounds Test Results**

Test Statistic	Value	
F-statistic	32.81	
Significance Level	I(0)	I(1)
10%	3.02	3.51
5%	3.62	4.16
1%	4.94	5.58

**Source:** Author's estimation.

Outcome

The calculated F-statistic exceeds the upper sure essential price in any respect importance tiers.

Interpretation

The results affirm the existence of a stable long-run equilibrium dating between financial institution credit growth and GST sales increase. This indicates that notwithstanding brief-time



period volatility and financial shocks, each variables pass together over time, reflecting a deep structural linkage among financial pastime and indirect tax revenues.

#### 7.4. Long-Run Estimation Results

**Table 4: Long-Run Coefficients**

Variable	Coefficient	Std. Error	t-Statistic	Probability
<b>BANK_CREDIT</b>	<b>0.000882</b>	<b>0.001391</b>	<b>0.6338</b>	<b>0.5278</b>
<b>Constant</b>	<b>-0.003874</b>	<b>0.016949</b>	<b>-0.2286</b>	<b>0.8197</b>

**Source:** Author's estimation.

##### Interpretation

The envisioned lengthy-run coefficient of bank credit score growth is fantastic (0.00088) but statistically insignificant ( $p = 0.528$ ). while the limits test confirms the presence of a protracted-run equilibrium dating, the insignificance of the coefficient shows that the impact of credit increase on GST sales is commonly transmitted thru quick-run channels in preference to chronic lengthy-run elasticities.

This locating is consistent with the shape of boom-price-based economic models, where monetary and monetary shocks predominantly affect tax revenues through cyclical enterprise interest, operating capital financing, and consumption-driven transactions, rather than long-time period structural shifts.

#### 7.5. Error Correction Model (ECM)

**Table 5: ECM Results**

Variable	Coefficient	Std. Error	t-Statistic	Probability
<b><math>\Delta</math>GST_GROWTH (-1)</b>	<b>0.6227***</b>	<b>0.1419</b>	<b>4.3873</b>	<b>0.0000</b>
<b><math>\Delta</math>GST_GROWTH (-2)</b>	<b>0.3543***</b>	<b>0.1102</b>	<b>3.2148</b>	<b>0.0018</b>
<b><math>\Delta</math>GST_GROWTH (-3)</b>	<b>0.1971***</b>	<b>0.0741</b>	<b>2.6586</b>	<b>0.0093</b>
<b><math>\Delta</math>BANK_CREDIT</b>	<b>0.0696***</b>	<b>0.0079</b>	<b>8.8459</b>	<b>0.0000</b>



<b>ΔBANK_CREDIT (-1)</b>	<b>0.0235**</b>	<b>0.0104</b>	<b>2.2545</b>	<b>0.0266</b>
<b>ECT (-1)</b>	<b>-1.9577***</b>	<b>0.1951</b>	<b>-10.0325</b>	<b>0.0000</b>

**Source:** Author's estimation.

#### Interpretation

The error correction term (ECT) is negative and highly significant ( $-1.958$ ,  $p = 0.000$ ), confirming long-run cointegration and indicating that about 196% of last month's disequilibrium is corrected within one month. This rapid adjustment suggests that India's GST system responds swiftly to economic shocks, aided by efficient institutions and real-time compliance mechanisms.

In the short run, contemporaneous bank credit growth positively affects GST revenue growth ( $0.0696$ ,  $p = 0.000$ ), with a lagged effect of  $0.0235$  ( $p = 0.027$ ), implying a cumulative two-month impact of  $\sim 0.093$  percentage points per 1% credit increase.

The ECM model shows strong explanatory power ( $R^2 = 0.781$ ,  $F = 65.29$ ,  $p < 0.01$ ), indicating robust overall performance.

#### 7.6. Economic Interpretation in the Indian Context

The empirical evidence demonstrates that bank credit increase performs a vital function in driving GST revenue performance in India, specially thru short-run transmission mechanisms. credit growth enhances business operations, operating capital availability, investment hobby, and household consumption, all of which generate taxable transactions underneath the GST regime.

The very high velocity of adjustment, as indicated through the ECT coefficient of  $-1.96$ , highlights the institutional robustness of India's GST framework, which enables economic sales to respond swiftly to macro-financial shocks. This underscores the importance of digital infrastructure, invoice matching, e-manner billing, and automated compliance in strengthening fiscal responsiveness.

#### 7.7. Policy Implications



The findings yield numerous critical policy implications:

1. Credit score expansion as a financial device:

A 1 percentage point increase in bank credit score boom increases GST revenue increase by almost zero.09 percent points within the brief run, highlighting the role of credit policy as an powerful revenue-improving instrument.

2. Financial-financial policy Coordination:

The robust and statistically sturdy transmission mechanism shows that RBI's credit policy stance immediately impacts monetary results, warranting near coordination between economic and monetary government.

3. MSME and Retail credit consciousness:

Increasing credit get right of entry to to MSMEs and retail borrowers can drastically enhance tax base growth and GST buoyancy, reinforcing inclusive increase objectives.

4. Macroeconomic Stabilization:

The fast pace of adjustment suggests that GST revenue acts as a effective automated stabilizer, speedily reflecting cyclical movements in monetary activity.

## 8. Conclusion

The observe concludes that bank credit increase and GST sales growth in India share a stable long-run equilibrium relationship, as confirmed by using the ARDL bounds-checking out technique. The empirical consequences show that financial institution credit enlargement exerts a fine and statistically enormous effect on GST sales growth inside the short run, with a 1 percent factor increase in credit score growth leading to an approximate zero.09 percentage point upward thrust in GST sales growth within months. the mistake correction time period is bad and fantastically huge, indicating speedy adjustment closer to long-run equilibrium and reflecting the performance and responsiveness of India's GST machine to macro-economic shocks.

The findings spotlight the essential position of credit score-led monetary pastime in improving economic overall performance, particularly under a modern-day, facts-pushed oblique tax regime like GST. The very high pace of adjustment underscores the significance of virtual infrastructure, invoice matching, e-manner billing, and automated compliance mechanisms in



strengthening economic responsiveness. The effects also propose that GST revenue acts as a effective computerized stabilizer, fast reflecting cyclical moves in financial pastime and assisting to easy monetary outcomes during boom-bust cycles.

From a coverage perspective, the study shows that credit score coverage can act as an oblique instrument for revenue enhancement, as enlargement in financial institution credit score at once translates into higher GST collections in the brief run. This reinforces the need for close coordination between economic and economic government to align credit-expansion techniques with sales-mobilization desires. expanding credit score get right of entry to to MSMEs and retail borrowers can further expand the tax base and improve GST buoyancy, helping inclusive growth and formalization of the economic system. overall, the findings make contributions to the literature by means of demonstrating the dynamic interplay among financial institution credit boom and GST sales boom in India and via highlighting the usefulness of the ARDL bounds-trying out technique in capturing both quick-run and lengthy-run linkages in a small-pattern placing.

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