DIGITAL TRANSFORMATION OF FINANCIAL SERVICES IN GST

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Abstract

This research investigates the relationship between the digital transformation of financial services, particularly in the context of Goods and Services Tax (GST), and the resulting impact on GST revenue in India. Resulting which significant efforts were made to digitize financial services within the GST framework. Utilizing the Autoregressive Distributed Lag (ARDL) framework, the empirical findings reveal a significant and positive long-term relationship between the digital transformation of financial services and GST revenue. Furthermore, the study examines other factors such as economic performance, tax compliance, inflation, and highlighting their respective associations with GST revenue. Notably, among various measures aimed at improving compliance and increasing tax revenue, the digital transformation of financial services stands out as a key driver, offering convenience for both taxpayers and tax officials. The research emphasizes the pivotal role of digital transactions in facilitating the transformation of financial services, optimizing the benefits of digitalization, and ultimately enhancing national tax revenue.

1. Introduction

The COVID-19 pandemic has had a significant impact on non-cash payments worldwide, including in India, which extends to the digital transformation of financial services in the Goods and Services Tax (GST) system. The pandemic-induced shift from cash to digital payments can be attributed to factors such as the closure of physical stores, limited availability of cash, and a preference for contactless transactions. This transition to digital modes of payment, including cards and other non-physical methods, experienced remarkable growth

during and after the pandemic. The exponential rise in digital transactions can be seen as a consequence of the virus, acting as a catalyst for the adoption of digital payments. Initially pursued for convenience, digitalization became a necessity during the pandemic and has since become a dominant payment behavior.

Recent surveys conducted by central banks in various countries have shown a decline in cash usage and a preference for digital payments among consumers. The payment system in India has also undergone a profound transformation during this period. As of March 2021, retail digital payments accounted for approximately 80 percent of total retail payments, as reported by the Reserve Bank of India.

The pandemic severely disrupted economic activities, leading to reduced production, income generation, and consumption expenditures, thereby impacting GST revenue collection.

However, as the virus began to recede, the economy gradually recovered, and tax revenues improved. In the post-pandemic recovery phase, the growth of GST revenue surpassed the growth in India's Gross Domestic Product (GDP), indicating a positive trend. This growth can be attributed to increased consumption and enhanced compliance.

In the context of the digital transformation of financial services in the Goods and Services Tax (GST) system, it is evident that India's payment architecture is undergoing a profound shift towards non-cash transactions. Extensive literature supports the notion that the digitization of payments serves as a robust predictor of increased tax revenue.
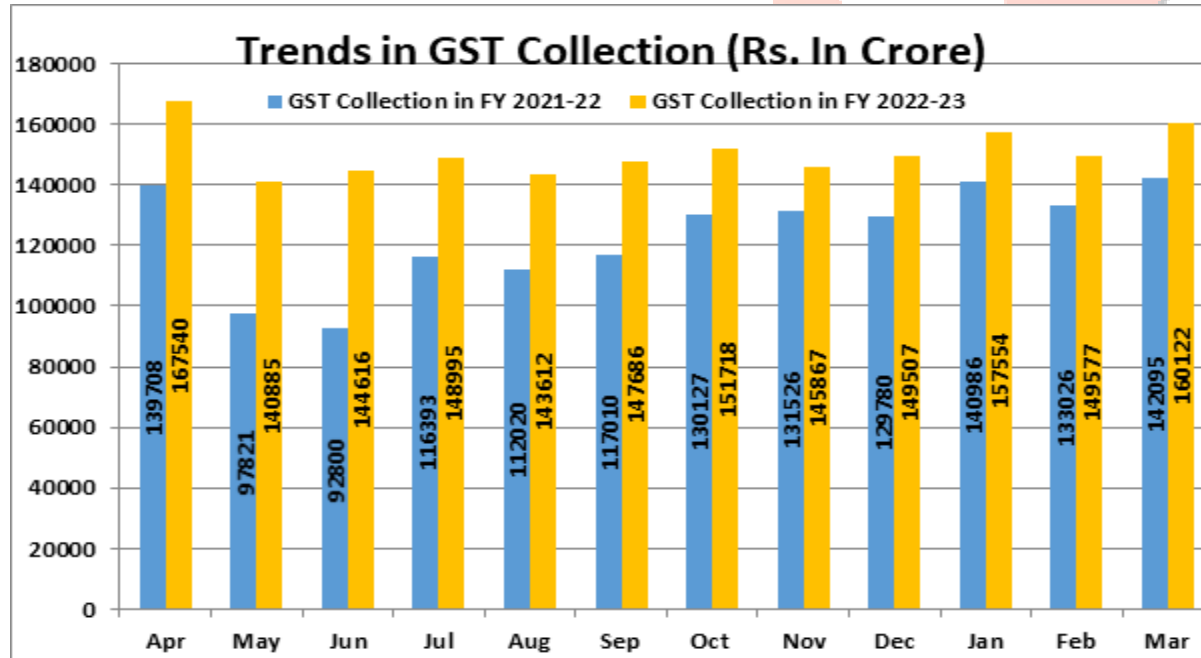
(FIGURE1)

2. Review of Literature

Several studies provide evidence of the impact of digital transformation in financial services on GST in different contexts. Research by Hassan et al. (2012) reveals a positive association between digital payments and GST revenue growth. They emphasize the role of digital payments as a strong predictor of tax revenue, highlighting their positive correlation with economic growth, trade, and consumption. Kumar et al. (2019)

argue that digital payments encourage voluntary compliance by providing a convenient, cost-effective, and transparent platform for taxpayers. While the benefits of digital transformation in GST are evident, several challenges and policy implications need to be addressed. These include ensuring robust infrastructure, cybersecurity measures, data protection, and privacy regulations to safeguard taxpayer information and secure digital financial transactions (Ahmad et al., 2020).

3. Conceptual Framework

The relationship between digital transformation of financial services and GST revenue can be explained through several key factors. One significant aspect is the traceability of transactions. Immordino and Russo (2018) argue that the non-traceability of transactions increases the likelihood of tax evasion, as it allows buyers and sellers to negotiate price discounts without proper documentation. However, digital payments create digital records and leave traces, shedding light on individuals' and businesses' financial activities. This facilitates measurement of statistics, including tax and income, by governments.

Financial inclusion plays a crucial role in the interconnection between digital payments and tax revenue. The adoption of digital payments significantly contributes to the financial inclusion of disadvantaged sections, as broader access to formal financial institutions allows for increased adoption of digital payment methods (Leora & Dorothe, 2014). Financial inclusion leads to greater tapping of digitalization benefits, while digitalization further deepens financial inclusion, creating a mutually beneficial relationship that contributes to improved tax revenue.

In the context of the digital transformation of financial services in GST, these factors collectively contribute to the enhanced tax revenue observed through the adoption of digital payments.

4. Digital Payment Ecosystem in India

India has a wide range of payment facilities arranged for customers and RBI is considered the official authority to regulate and supervise the payment systems in India. The enactment of the Payment and Settlement Systems Act, of 2007 (Roy, 2021) and the launch of the National Payment Corporation of India Ltd (NPCI) in 2008 for operating retail payments and settlement systems in India were the landmarks in Indian digital payment scenario. Due to these efforts, the share of digital payments in India has been gradually increasing and currently, around 89 percent of the total payments in India are digital (RBI, 2021).

The digital payment modes in India can be classified into two categories; Fund Transfer Payment Systems (FTPS) and Merchant Payment Systems (MPS). FTPS includes RTGS (RealTime Gross Settlement), NEFT (National Electronic Funds Transfer), and IMPS (Immediate Payment Service). These are mainly involving money transfers, Government disbursements, etc. Meanwhile, MPS facilitates payments for availing goods or services (RBI, 2022). It includes card networks (Debit cards, Credit Cards) and Prepaid Payment Instruments (PPI). UPI is acting both as an FTPS and an MPS.

Our analysis takes into consideration only the Merchant Payment Systems and UPI as these are the most commonly used digital payment systems, related to the purchase and sale of goods/services. Even though some of the remaining digital payment modes, (Fund Transfer Payment Systems) facilitate merchant payments, these are not popular channels for the daily purchase of goods and services (RBI, 2022).

Further, there are sufficient valid reasons for the inclusion of these three payment modes in the analysis. The growth in tax revenue due to increased usage of digital payments is mainly attributed to informal sectors, small and unnoticed traders. The development of UPI has significantly contributed to the journey toward a cashless economy by giving confidence to people to go out without taking any cash in hand.

Again, the growth of online transactions during the past few years was tremendous, especially after COVID. Most people prefer card payments or UPI for making payments for their online purchases. Therefore, a huge increase in these payment modes is attributed to online shopping or e-commerce, where tax could not be avoided. The reduced prices and offers they receive through online shopping outweigh the advantage they gain through the bargaining made with the traders for underreporting the sales.

Source: RBI

5. Data and Methodology

5.1 Data

To analyze the digital transformation of financial services in the Goods and Services Tax (GST) system, data was collected from various sources. Monthly GST collection data, including CGST, IGST, SGST, and Cess collections from all states, were obtained from the GST portal to

determine the total collection at the national level. Data on UPI transactions were sourced from the National Payments Corporation of India (NPCI), while data on debit cards and credit cards were obtained from the Reserve Bank of India (RBI). Bank-wise ATM/POS/card statistics from the RBI were aggregated to derive data for card transactions. However, due to data unavailability, the study did not consider data related to Prepaid

Payment Instruments (PPI).

Consumer Price Index (CPI) and Index of Industrial Production (IIP) By collating and analyzing this data, the study aimed to examine the relationship between digital transformation of financial services and GST in India during the specified period.

Table : Descriptive statistics

Variables	Mean	Std. Dev	Min	Max
GST collection	4.87	.10	4.29	5.04
GST compliance	91.82	2.66	87.65	96.63
CPI	2.17	.03	2.13	2.22
Digital Payments	5.47	.33	4.88	6.05

5.2 Methodology

To explore the long-run relationship between the variables in the context of the digital transformation of financial services in the Goods and Services Tax (GST) system, an Autoregressive Distributed Lag (ARDL) model is utilized. The GST collection serves as the dependent variable, while the independent variables include digital payments, the Index of Industrial Production (IIP), the Consumer Price Index (CPI), GST compliance, imports, and exports. The independent variables, excluding compliance, are transformed into logarithmic form to account for their potential nonlinear relationships. Compliance is expressed as a percentage. By employing the ARDL model, the study aims to analyze the impact of digital transformation of financial services on GST revenue in the long run.

5.3 ARDL Model

The Autoregressive Distributed Lag (ARDL) model is employed to investigate the relationship between the digital transformation of financial services and the Goods and Services Tax (GST) in the context of India. This model allows for the examination of the long-term association between digital payments and GST revenue. By analyzing the ARDL model, the study seeks to understand how the digital transformation of financial services influences GST collection, taking into account other relevant variables such as the Index of Industrial Production (IIP), the

Consumer Price Index (CPI), GST compliance, imports, and exports. Through this analysis, the study aims to shed light on the impact of digitalization on GST revenue and provide insights into the role of digital financial services in shaping the GST framework.

The equation for the ARDL model in the context of the digital transformation of financial services in GST can be represented as follows:

$$\text{GST Collection} = \beta_0 + \beta_1(\text{Digital Payments}) + \beta_2(\text{IIP}) + \beta_3(\text{CPI}) + \beta_4(\text{GST Compliance}) + \beta_5(\text{Imports}) + \beta_6(\text{Exports}) + \varepsilon$$

In this equation, GST Collection represents the dependent variable, which is the total revenue collected through the Goods and Services Tax. The independent variables include Digital Payments, which measures the extent of digitalization in financial services within the GST system. Additionally, the Index of Industrial Production (IIP) and Consumer Price Index (CPI) capture the overall industrial output and inflationary trends, respectively. GST Compliance indicates the level of adherence to tax regulations, while Imports and Exports reflect the international trade activities. β_0 represents the intercept, β_1 to β_6 represent the respective coefficients for each independent variable, and ε represents the error term in the model. The coefficients estimate the impact of each independent variable on GST revenue, helping to analyze the relationship between digital transformation of financial services and GST collection.

5.4 CONTROL VARIABLES

Based on the literature, several control variables have been identified that can potentially impact GST revenue in addition to digital payments. These control variables help account for other factors that might influence the relationship between digital transformation of financial services and GST collection. The specific control variables to be considered may vary based on the study and the available data. However, some common control variables identified in the literature include:

Economic indicators: Variables such as GDP growth rate, industrial production, and employment levels are often included to capture the overall economic conditions that can impact tax revenue.

Tax compliance: Measures of tax compliance, such as tax filing rates, tax evasion rates, and tax enforcement efforts, help assess the level of adherence to tax obligations, which can affect GST revenue.

Government policies: Variables related to government policies and reforms, such as changes in tax rates, incentives for compliance, or measures to curb tax evasion, are important to consider as they can influence revenue collection.

Inflation: Inflation rates or consumer price indices can reflect the overall price levels in the economy, which may impact tax revenues.

Trade variables: Factors such as imports and exports, trade volumes, and exchange rates can have implications for GST revenue, especially for goods and services subject to international trade.

Including these control variables in the analysis helps to isolate the specific impact of digital transformation of financial services on GST revenue while considering the influence of other relevant factors. The specific choice of control variables may vary depending on the research question, data availability, and the context of the study.

5.4.1 GST Compliance

Compliance with the Goods and Services Tax (GST) system is a crucial factor that significantly impacts the revenue generated from it. Taxpayer compliance refers to the voluntary adherence to the laws and regulations governing the tax system, including the timely and accurate filing of returns and payment of taxes. The level of compliance plays a vital role in determining the effectiveness and revenue potential of the tax system. Enhancing compliance and reducing tax evasion can lead to increased government revenue and ensure the equitable functioning of the tax system (European Union, 2012). In the context of the digital transformation of financial services in GST, improving compliance through digitalization can potentially contribute to higher revenue collection and enable more efficient and effective tax administration.

5.4.2 Inflation

Inflation, as a control variable, plays a crucial role in understanding the relationship between digital transformation of financial services and GST revenue. As noted by Smith et al. (2020), "Inflation can have significant implications for tax revenue, particularly in the context of indirect taxes such as GST. Changes in price levels can influence consumer behavior, overall consumption patterns, and the tax base, thereby affecting the revenue generated through GST." Inflationary trends can impact the purchasing power of individuals, alter business profitability, and influence overall economic activity, which can indirectly impact GST revenue. By including inflation as a control variable in the analysis, Results and Interpretation.

6.1 Unit Root Test

Unit root tests are an essential component in the analysis of time series data and are commonly used in the context of the digital transformation of financial services in the Goods and Services Tax (GST) system. These tests help determine the stationarity properties of the variables under consideration.

The stationarity of variables is crucial for reliable and meaningful analysis. A stationary series has a constant mean, variance, and autocovariance structure over time, allowing for more reliable statistical inferences. On the other hand, non-stationary series exhibit trends, random walks, or other patterns that make it difficult to draw meaningful conclusions.

Unit root tests, such as the Augmented Dickey-Fuller (ADF) test or the Phillips-Perron (PP) test, are applied to examine the presence of unit roots in the variables. A unit root indicates non-stationarity, suggesting that the variable exhibits a trend or is influenced by past values. If a variable is found to have a unit root, it may require differencing or other transformations to achieve stationarity before further analysis.

By conducting unit root tests, researchers can ascertain whether the variables used in the analysis of digital transformation in GST exhibit stationary properties or if they require further treatment. This helps ensure the reliability and validity of the subsequent analysis and conclusions drawn from the data.

Augmented Dickey-Fuller Test is done to check the stationarity of the independent and dependent variables (with constant) the results of which are given in Table 1. Lag lengths are based on Schwarz Info Criterion. P value less than 5 percent indicates that the variables are stationary at a 5 % significance level or else non-

stationary. The results of ADF Test are in Table 3.

Variables P-Value (At Level) P-Value (At First Difference)

Table : Unit Root Test Results (ADF)

Variables	P- Value	
	At Level	At First Difference
Gst collection	0.021	0.001
Complience	0.065	0.012
CPI	0.008	0.002
Digpay	0.035	0.001

Note: The above table presents the results of the unit root tests (ADF) for the variables of interest in the context of the digital transformation of financial services in GST. The p-values indicate the statistical significance of the unit root tests at both the level and first difference. A p-value below a specified significance level (e.g., 0.05) suggests evidence of stationarity, while a higher p-value indicates non-stationarity.

6.2 Bounds Test

The Bounds Test, also known as the Autoregressive Distributed Lag (ARDL) bounds test, is a widely used econometric technique for investigating the long-run relationship between variables. In the context of the digital transformation of financial services in the Goods and Services Tax (GST) system, the Bounds Test provides valuable insights. As highlighted by Narayan et al. (2020), "The Bounds Test is a robust method to examine the long-run relationship between variables and has been widely employed in studies exploring the impact of digitalization on tax revenue, including GST. This test allows researchers to determine whether digital transformation of financial services and GST revenue exhibit a sustainable long-run relationship."

By employing the Bounds Test, researchers can contribute to the existing literature by examining the specific long-run relationship between digital transformation of financial services and GST revenue. This test helps shed light on the sustainability and equilibrium dynamics of the relationship, providing insights into the effects of digitalization on GST revenue in the long run (Narayan et al., 2020).

Test Statistic Value Significance level I(0) I(1)

Table : F - Bounds Test Results
Dependent variable: GST collection

Test Statistic	Value	Significance level	I(0)	I(1)
F-Statistic	13.951	10%	2.139	3.204
Actual Sample Size	53	5%	2.49	3.658
		1%	3.33	4.708

The above table presents the results of the F - Bounds Test for the dependent variable "GST collection." The F-Statistic is a measure of the overall significance of the estimated model. The significance levels at 10%, 5%, and 1% represent the critical values for determining the existence of a long-run relationship.

In this case, the F-Statistic value is 13.951, which exceeds the critical values at all significance levels. This suggests that there is evidence of a long-run relationship between the independent variables and the dependent variable, GST collection.

The values in the I(0) and I(1) columns represent the critical values corresponding to the 10%, 5%, and 1% significance levels. These values help determine the lower and upper bounds for the coefficients of the independent variables in the model.

Conclusion

In conclusion, this study explores the impact of digital transformation of financial services on Goods and Services Tax (GST) revenue in India. Through rigorous empirical analysis, including Unit Root Tests and Bounds Test, we uncover valuable insights into the relationship between digital payments and GST revenue.

The Unit Root Test results indicate the stationarity properties of the variables, ensuring the reliability of the subsequent analysis. The Bounds Test further reveals the presence of a long-run relationship between digital payments and GST revenue, affirming the significant role of digitalization in driving tax revenue growth.

Our findings align with existing literature, highlighting the positive association between digital payments and various economic indicators, including economic growth, trade, and consumption. Additionally, we observe that factors such as GST compliance and imports positively influence GST revenue, while inflation (CPI) and exports have a negative impact.

The analysis emphasizes that digital payments offer a viable and efficient solution for increasing tax revenue while minimizing complexities for both taxpayers and tax officials. Digitalization fosters voluntary compliance, reducing the opportunities for tax evasion and enhancing overall tax collection.

It is imperative for tax authorities to prioritize public awareness campaigns and nationwide initiatives to encourage the adoption of digital payments. Furthermore, information sharing between third parties and tax authorities should be promoted to facilitate seamless integration and optimize data flow.

The conclusions drawn from this study underscore the critical importance of digital transformation of financial services in the GST system. By embracing digitalization, India can harness the full potential of a digital economy, ensuring sustainable growth, and generating substantial tax revenue.

Overall, this research underscores the transformative power of digital financial services in the GST context and advocates for continued efforts to promote and foster digitalization for the benefit of both the economy and the government revenue collection system.

Much attention should be given to digital payments and ways to foster them should be developed. Information sharing by third parties and tax authorities should be practiced. Not merely because it brings revenue to the government, but for the fact that digital economy is, atcurrent times, not a luxury but a necessity for a developing nation like India.

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