Manuscript ID:
IJEBAMPSR-2025-020502

Volume: 2

Issue: 5

Month: October

Year: 2025

E-ISSN: 3065-9140

Submitted: 05-Sep 2025
Revised: 15-Sep -2025
Accepted: 15- Oct-2025
Published: 31-Oct-2025

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DOI: 10.5281/zenodo.17446133

DOI Link:
https://doi.org/10.5281/zenodo.17446133

The Role of Digital Economy in Enhancing Goods and Services Tax Collection: Evidence in India

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Abstract

India's digitalisation has profoundly reshaped its tax administration outline, mainly under the Goods and Services Tax (GST) regime. This paper explores the role of digital economy in strengthening India's Goods and Services Tax (GST) collection by using vital variables such as Unified Payments Interface (UPI) transaction volume which indicate broadening of the digital financial ecosystem, and Unified Payments Interface (UPI) transaction value, which demonstrate confidence on the digital means for high value transactions. E-way bill generation, which shows efficiency and formalization of logistics and supply chains and GSTR-1 and GSTR-3B filings, signifies compliance levels among taxpayers. By leveraging descriptive statistics techniques and trend analysis methods for the eight years period from 2017–18 to 2024–25, the analysis demonstrates that a notable upward trend in digital payments and compliance activities of taxation, which has amplified transparency and condensed tax evasion, which has paved the way for better efficiency in revenue mobilization. The study elucidates that UPI have widened the formal financial ecosystem, whilst on the compliance side e-way bills and GST return filings have boosted accountability in supply chains and reporting. Ultimately, the study demonstrates that digitalization has emerged as a crucial driver for accelerating GST revenue performance safeguarding long-term financial constancy in India. Thus, through digitalisation tax collection can be enhanced to a large extent.

Keywords: *Digital economy, Digital payments, GST collection, Compliance, Return fillings, Fiscal year, Tax evasion.*

Introduction

India's swift digitalisation has restructured the means by which economic activity is recorded, verified and taxed. Since last ten years, India saw extraordinary upturn in online based payments. The extraordinary upturn of digitalization has made the nation a cashless economy to an extent. (Kumar, 2024). The extraordinary upturn of digitalisation has modified the structure of modern economies. Digitalisation enabled transparency, efficiency, and innovation in all sectors across the globe. Within the Indian framework, digitalisation has been critically important in reconfiguring the framework of public finance system specifically in the Goods and Services Tax framework. The Goods and Services Tax is a comprehensive indirect tax system executed to harmonise taxation structure throughout the country. (Eliganur, 2024). GST was introduced in July 2017 with the aim to unify different taxes into one tax system. (Purohit, 2018). Digitalisation has led to increase in the effectiveness of GST collection although the objective was only for easy compliance and to boost revenue buoyancy. Unified Payment Interface (UPI), Credit and Debit card transactions, e-invoice, tax compliance portals etc such digital technologies has bought a paradigm shift in the way enterprises file and pay taxes. (Chakraborty and Bose, 2020). The launch of digital technologies such as e-way bills, GSTR-1, GSTR-3B, provides the Government with necessary information about tax collection. (Katore et.al 2024). The study examines the role of digital economy in enhancing GST collection in India, by taking into consideration five indicators that represent digitalisation UPI transactions value and volume, eway bill generation, and the filling activity in GSTR-1 and GSTR-3B.

How to Cite this Article:
Sindooram, S. M., & Kombde, S. T. (2025). The Role of Digital Economy in Enhancing Goods and Services Tax Collection: Evidence in India. International Journal of Economics, Business, Accounting, Agriculture and Management Towards Paradigm Shift in Research (IJEBAMPSR), 2(5), 6–13. https://doi.org/10.5281/zenodo.17446133

UPI India's instantaneous retail payment system has mounted as the spine of small value, high frequency digital commerce, providing a rich, time stamped trail of transactions across the formal and semi formal economy (NPCI, 2023 BIS 2024). In the tax management, GST returns and transport documentation and natively digital. GSTR-1 accounts outward supplies of invoices that feed recipients input tax claims, solidifying third party verification, GSTR-3B is the self-assessed monthly summary return used to pay tax. (CBIC,2017, CBIC, 2021). The eway bill system unified with e invoicing digitalizes the movement of goods above a particular limit, refining traceability across supply chains and states and restricting evasion through real time verifications. (CBIC,2019, NIC, 2022). Globally and Indian evidence recommends that digital reporting and third-party paths can substantially boost VAT kind collections via snowballing the alleged possibility of detection and allowing systemic invoice matching. (Pomeranz, 2015; Naritomi,2019). In India developing empirical work using monthly data finds an encouraging long run association between digital payments and GST revenue, after monitoring for macro-economic conditions and compliance substitutions. (Joseph and Ramalingam 2022).

This paper gathers a multi-indicator panel across UPI transactions volume and value, number of E-way bills generated, monthly filling activity in GSTR-1 and GSTR-3B. The ultimate goal line is to trace trends between these digital economy indicators. By combining these indicators within a clear framework, the study contributes to the policy discussion on how India's digital rails payments, reporting and logistics jointly enhance tax capacity and revenue buoyancy under the GST regime. (Economic Survey,2023-24, BIS, 2024).

Conceptual Framework

1. ***GST Collections*** implemented in India in July 2017 is a comprehensive indirect tax system levied on the supply of goods and services incorporating multiple state and central taxes. GST collections refer to the revenue mobilized by the government through this system.
2. ***Unified Payments Interface (UPI)*** introduced by the National Payments Corporation of India in 2016 is an instant payment system that enables on the spot fund transfers between bank accounts using mobile devices. It is one of the widely used digital payments platform in India enabling both small and large number of transactions. UPI transactions volume indicates number of transactions and value indicates monetary worth of the transactions. UPI acts as a substitute for adoption of digital finance in the economy.
3. ***GSTR-1*** is a monthly or quarterly return that tax payers registered under GST are obligatory to file covering details of all the outward supplies of goods and services. It provides invoice level data on sales which the government uses to track tax liability. A rise in the GSTR- 1 fillings indicates better reporting of sales and enhanced transparency in the indirect tax system.
4. ***GSTR-3B*** is a self-declared summary return that businesses must file monthly, presenting details of outward supplies, inward supplies entitled for input tax credits, and the net tax payable. It is vital for tax remittance based on which the amount of GST payable to the government determined. Increasing trend of GSTR-3B filling reflects improving compliance and tax administration efficiency.
5. ***E-way Bills*** is document generated by electronic means required for movement of goods worth more than a threshold value (above 50000) as per GST guidelines. It was developed to limit tax evasion. It documents data of the consignor, consignee, and the goods in transit. E-way bills show formalisation of goods movement and greater traceability in supply chains.

Review of Literature

A foundational body of work shows that third party reporting and transaction traces are central to VAT and GST enforcement. Klevan et.al., 2011 proved that evasion is concentrated in self-reported income, whereas third party reported income is mostly complaint, highlighting the deterrence value of information trails. According to Pomeranz (2015) VATs built in paper trail endorses self-enforcement across B2B chains, evidence from natural experiments from Chile assures sizable compliance responses to enhanced cross checks. Complementing this Naritomi, 2019 shows that incentivizing consumers to request receipts in Brazil boosts third party information and reduces evasion. A rising empirical literature links e-invoicing mandates to higher reported sales or value added and VAT liabilities. Bellon et.al., 2019, 2020 found that mandatory e-invoicing increased reported transactions and VAT liabilities by 5 to 10% in the first year after adoption with spillovers along with supply chains as coverage scales. Iyer, 2021 highlighted that after demonetisation digital payments in India significantly upsurged. It was further fuelled by government digital India initiative which aims to transform the nation into a digitally empowered society and knowledge economy striving for a faceless, paperless and cashless environment. Saini and Sharma, 2019 emphasized the importance of GST in driving economic acceleration. On the contrary, Gopal, 2011 highlighted the inevitability of GST to streamline tax systems and stimulate economic growth. Developing India focused evidence links greater digital payment intensity to

higher GST revenues after regulating for macroeconomic covariates, consistent with cash displacement, broader formal participation, and easier reporting at the point of sale (Joseph & Ramalingam, 2022, 2024). On the supply-chain and reporting side, the e-Way Bill (EWB) system mandating digital documentation for goods in transit above threshold values improves auditability of movements, curbs invoice-less trade, and enables post-facto analytics, thereby reinforcing the GST's information trail (CBIC, 2019; NIC, 2022). Within the return's architecture, invoice-level outward supplies in GSTR-1 feed the input tax credit claims of buyers, while GSTR-3B operationalizes monthly self-assessment and payment; this design supports automated cross-checks and reduces scope for false credits when paired with e-invoicing and analytics (CBIC, 2021). International quasi-experimental studies on e-invoicing further suggest that mandating digital invoices raises reported sales and VAT liabilities and propagates compliance gains along supply chains (Bellon et al., 2019, 2022). Policy syntheses from India also document how the expansion of UPI and card acceptance, together with e-invoicing, EWB, and return-matching, has coincided with improvements in compliance and buoyant GST collections, underscoring a complementary ecosystem in which payment-side transparency (UPI/cards) and reporting/logistics controls (EWB, GSTR-1/GSTR-3B) jointly enhance revenue performance (BIS, 2024; Economic Survey, 2023–24; RBI, 2024).

While international studies underscore the significance of electronic payments and e-invoicing in bolstering VAT systems. However, there is a limited indications on how India's specific digital reforms influence GST collections. Ongoing research mainly studies either digital payments (UPI) or compliance systems (e-way bills, GSTR filings) independently in a single analytical framework. Over and above that, there are only a few Indian studies that are causality assessment that exploit policy changes such as e-invoice threshold revisions or staggered state-level adoption of digital tools, otherwise most of them are descriptive or correlational. There is also limited literature on how payment side digitalization (UPI and card usage) complements supply-chain–oriented enforcement (e-way bills, GSTR-1 and GSTR-3B) to jointly enhance revenue mobilization. This creates a gap for research that combines multiple digital economy indicators to assess their collective impact on GST performance in India.

1. **Data And Methodology**

   The current study endeavours to evaluate the evolving digital economy and their impact on GST collection in the India. The digital economy encompasses UPI transactions Volume and Value, E-Way bills generations, GSTR-1 and GSTR-3B fillings, GST registered digital platforms through descriptive and conceptual methodologies. The study covers the period from 2017-18 to 2024-25. Charts are used to show trends and growth. Data on GST collection, GSTR-1, GSTR-3B, E-Way bills, GST registered digital platforms are taken from GSTIN whereas data on digital payments are taken from National Payments Corporation of India (NPCI) websites respectively.

2. **Results And Discussions**

   Over the past decade, digitalisation has reshaped the way India's economy and tax system work. The spread of platforms like the Unified Payments Interface (UPI) has made digital payments a part of everyday life, leading to a sharp rise in both the number and value of transactions. This shift from cash to digital money has not only brought more people into the financial system but also made transactions more transparent and easier to track. At the same time, the Goods and Services Tax (GST), introduced in 2017, has embraced technology through tools such as e-way bills, online return filing, and automated compliance systems. These changes have simplified tax procedures, encouraged regular filing, and reduced the space for tax evasion. Taken together, they show how digital technology is strengthening governance, widening the tax base, and helping India move toward a more formal and efficient economy.

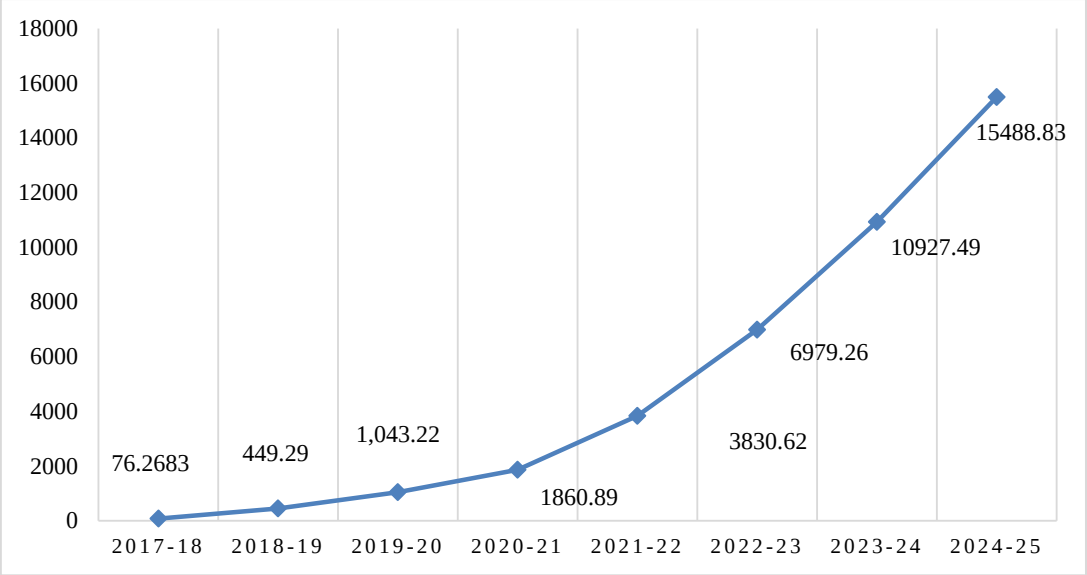

Figure 1: Volume of digital transactions from 2017-18 to 2024-25

Figure 1 depicts the increasing trend in the volume of digital transactions over the years. In the financial year 2017- 18 on an average there were only 76.26 million digital transactions which augmented to 449.29 million in the subsequent year. Further rushed to 15488.83 million in the financial year 2024-25. It clearly echoes a massive growth in the digital economy of India. The surge in the UPI volumes indicates broadening of the digital financial ecosystem which enhances GST compliance by making transactions traceable, transparent, and better integrated into the structure economy.

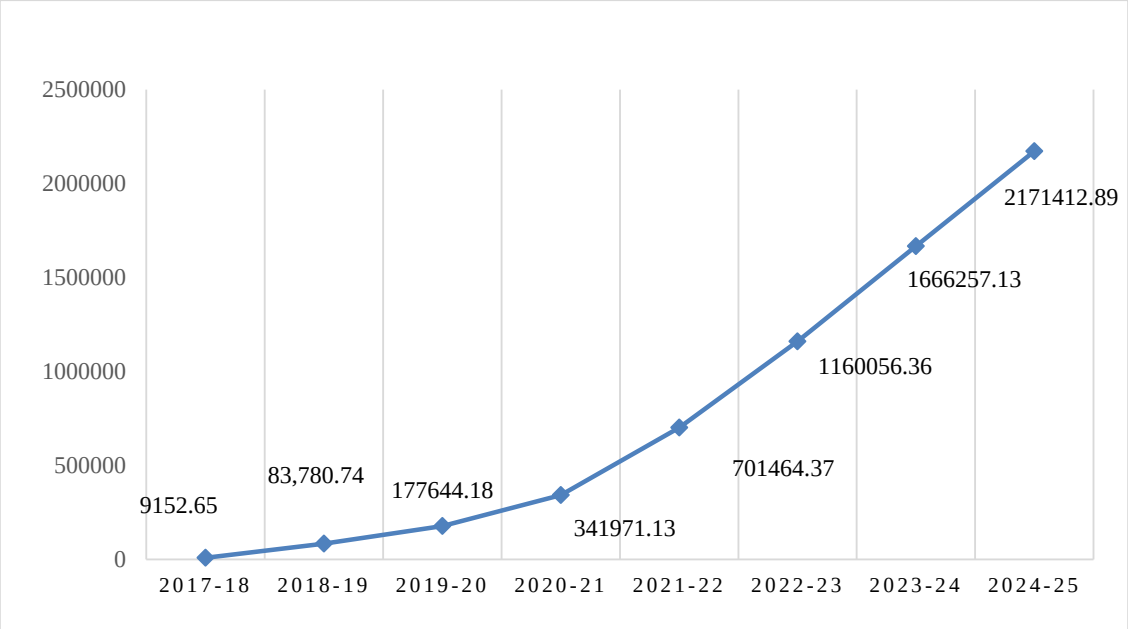

Figure 2: Values of UPI transactions from 2017-18 to 2024-25

Figure 2 illustrates the value of UPI transactions, which complements the volume data by representing the financial scale of digital transactions. In the financial year 2017-18 on an average there were only 9152.05 million worth values of digital transaction which increased to 2171412.89 million by 2024- 25. The steep rise in transaction value indicates confidence on the digital means for high value transactions. This gives substantial inferences meant for GST, as transactions steered via digital modes lessens the possibility aimed at unreported cash transactions and thus causative to better tax compliance and revenue utilization.

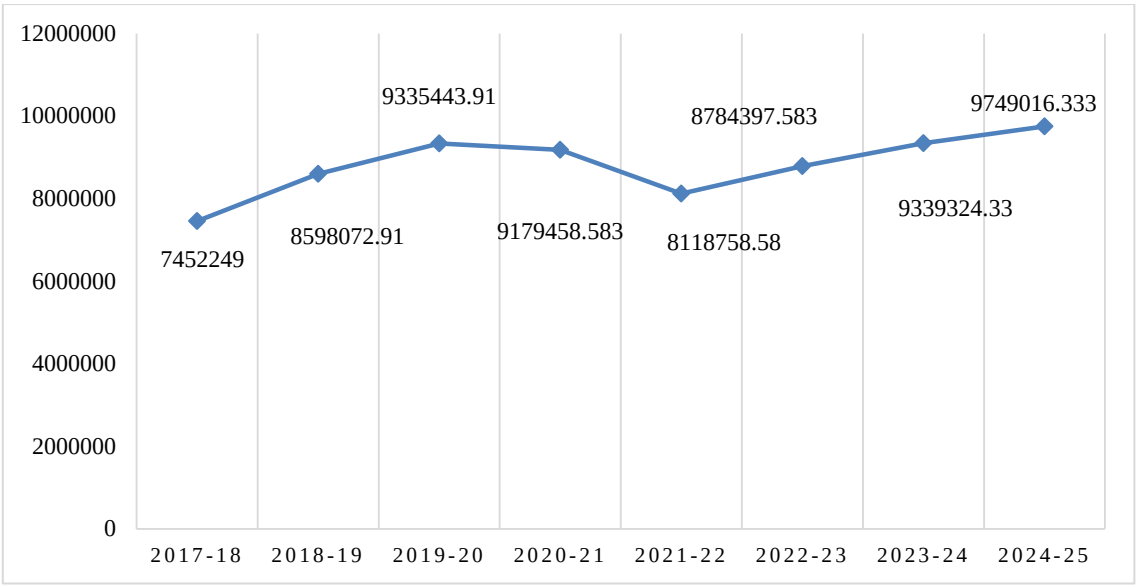

Figure 3: Average number of GSTR-3B fillings from 2017-18 to 2024-25

Figure 3 portraying the average number of GSTR-3B fillings shows the range of yearly self-declaration of tax obligations and Input Tax Credit dues by businesses. The sturdy rise in average GSTR-3B fillings from 7452249 in 2017- 18 to 9749916.33 in 2024-25 signifies higher compliance levels among taxpayers, basically eased by digital return filing mechanisms. The accessibility of easy digital portals has compacted has made the compliance less costly and less time consuming as well, encouraging business to file regularly. This echoes the role of digital economy in encouraging compliance process, which directly leads to increased and more consistent GST collections.

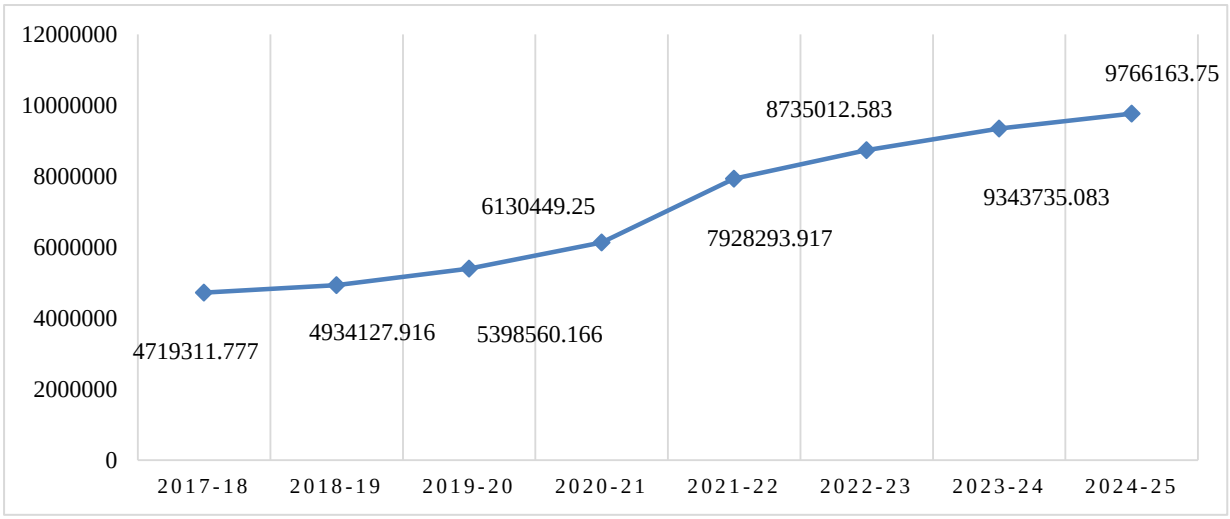

Figure 4: Average GSTR-1 fillings from 2017-18 to 2024-25

Figure 4 illustrates average GSTR-1 fillings, which shows the trend in outward supply declarations by registered tax payers. The increasing trend in GSTR-1 fillings from 4719311.77 in 2017-18 to 9766163.75 in 2024-25 is parallel with the snowballing digitalisation in business reporting and invoicing. As GSTR-3B data is formed on the basis of GSTR-1 data, so from the graphs trend it can be easily concluded that digitalisation has boosted transparency and condensed the tax evasion possibilities.

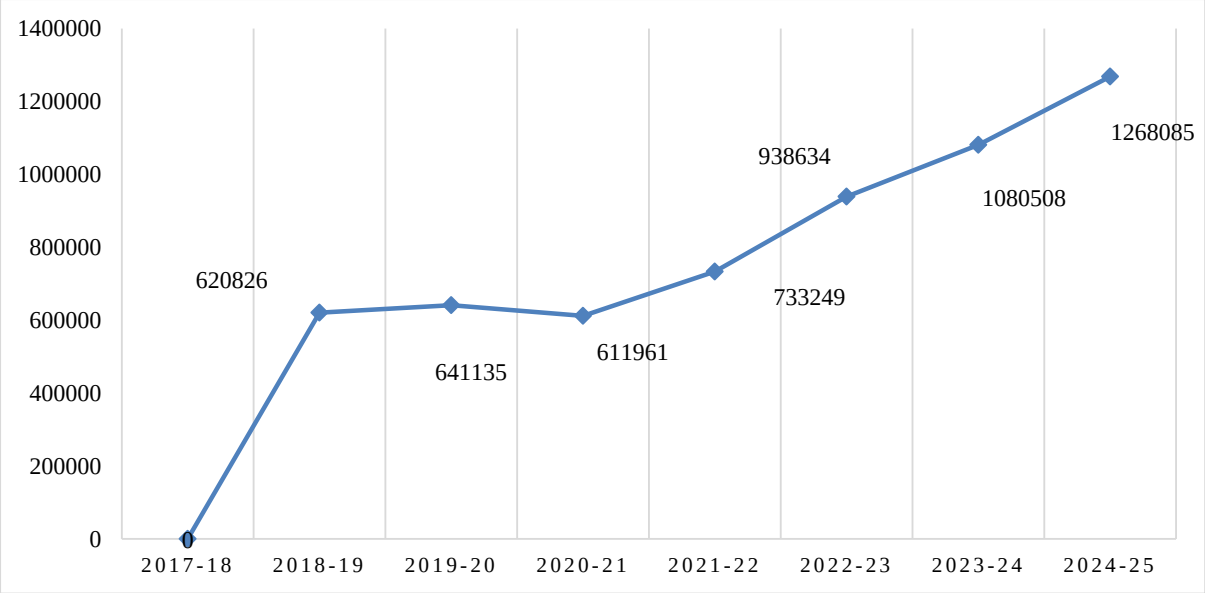

Figure 5: Average number of E-way Bills from 2017-18 to 2024-25

Figure 5 shows the average number of E-way Bills generated in the seven years. Which is a critical substitution for trade flows and compliance in goods movements. The data reflects an incessant growth in E-way bills generation from 620826 in 2017- 18 to 1268085 in 2024-25 which reflects greater efficiency and formalization of logistics and supply chains. The introduction of E-way bills has led to effective tracking of goods movement which helped in reducing tax leakages due to underreporting and tax evasion. Thus, it led to expanding GST tax base.

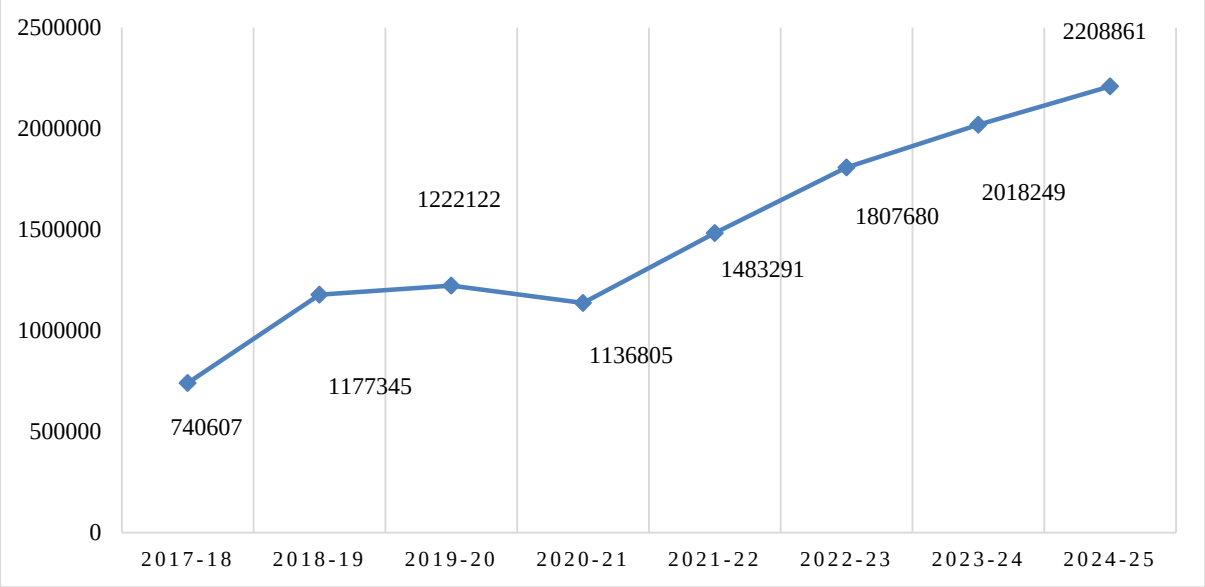

Figure 6: Annual GST collection

Figure 6 shows annual GST collection, which showcases an upward trend in collection from 740607 Crore in 2017- 18 to 2208861 Crore in 2024-25 despite certain fluctuations linked to macroeconomic conditions such as in 2020-21 due to the covid pandemic. This upward graph trend clearly underlines the positive impact of digital integration in tax administration.

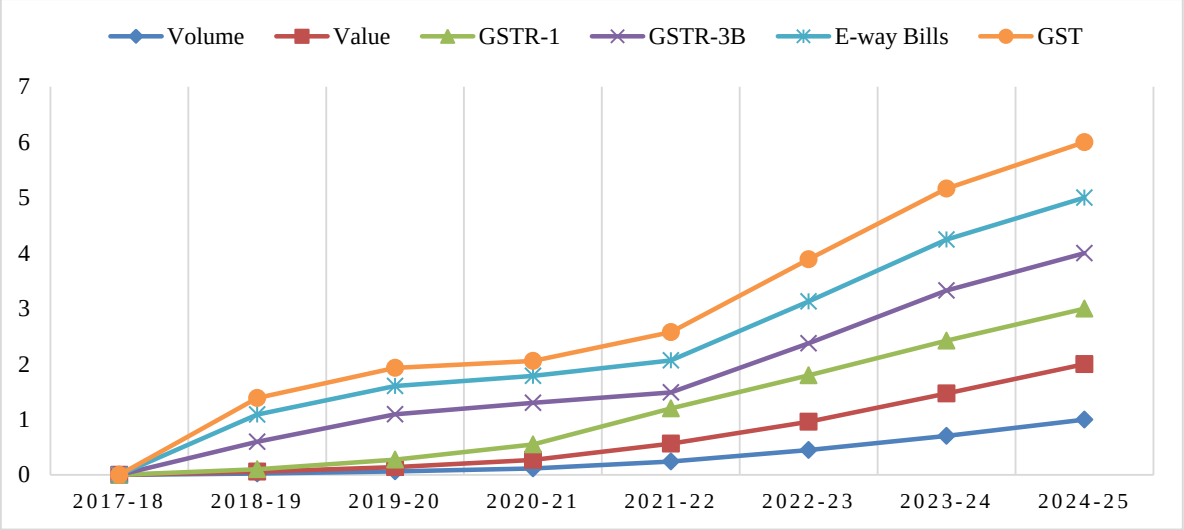

Figure 7: Combined values of indicators used for the study.

Figure 7 which is combined trend chart depicts the role of digitalisation in surging GST collection. It gives strong evidence of the role of the digital economy in enhancing GST collection in India. As different indicators are expressed in different values so as to normalise all the indicators in a single value mini- max normalisation method was used to rescale the indicators to a 0-1 scale. This method guarantees the differences in measurement does not distresses comparability. The graph clearly shows that UPI volume and value is growing at a fastest rate since 2017-18. On the other hand, GSTR-3B and GSTR-1 fillings also increasing at a steady rate signifying regular growth in tax compliance. Eway bills also showcasing a consistent and moderate growth. Thus, the normalised graph shows a convergency indicating digitalization has made tax administration more efficient and transparent leading to increment in tax collection.

Conclusion

The study indicates that the development of India's digital economy has strengthened the Goods and Services Tax system by stimulating transparency, compliance, and efficiency to a large extent. Indicators such as UPI transaction volume and value, e-way bill generation, and regular GSTR-1 and GSTR-3B filings show a consistent upward trend, highlighting the efficacy of digital platforms in limiting tax evasion and broadening the tax base. The results underscores that digital payments diminish the space for unreported cash dealings, while return filings and transport documentation enhance traceability and accountability across supply chains. Despite short-term fluctuations associated to macroeconomic shocks, the overall trend of GST collection remains positive, highlighting the structural benefits of digitalisation. Thus, the merging of payment digitalization and compliance mechanisms illustrates how digital tools can act as a catalyst for sustained revenue growth and fiscal stability in India.

Acknowledgment

The authors would like to express their sincere gratitude to Department of Economics-Autonomous, Shivaji University, Kolhapur for providing necessary facilities and support to carry out research. Similarly, Sindooram S M is thankful to Shivaji University, Kolhapur for providing financial assistance for doctoral studies. We extend our appreciation to all colleagues and friends for their constructive discussions and encouragement.

Financial support and sponsorship

Nil

Conflict of Interest

The authors declares that there is no conflict of interest regarding the publication of this paper.

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