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AN ANALYSIS OF DIGITAL TRANSPARENCIES UNDER THE GST 2.0 ECOSYSTEM WITH KEY FOCUS ON DIGITAL TRANSFORMATIONS IN ITC CLAIMS

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ABSTRACT

The integrity of the GST ecosystem, for maintaining the norms of the Input Tax Credit (ITC) mechanism, acts as a fundamental basis to the effectiveness of India's Goods and Services Tax (GST) regime. However, in case the ITC claims end up being fraudulent being facilitated through fake invoicing or through circular trading and posing as fictitious transactions, it shall continue to undermine tax compliance and revenue mobilisation. To strengthen enforcement, tax authorities have introduced technology-enabled compliance mechanisms, including Radio Frequency Identification (RFID), FASTag-based vehicle tracking, and the Electronic Way Bill (E-Way Bill) system, to enhance transaction verification and detect tax evasion.

This study evaluates the effectiveness of these digital interventions through a forensic accounting perspective. Using secondary data from GST disclosures, enforcement records, and government policy reports, the analysis integrates transaction-level reconciliation, trend analysis, and anomaly detection to examine the consistency between tax invoices, E-Way Bills, and the physical movement of goods captured through RFID-enabled FASTag infrastructure.

The findings indicate that integrating digital invoicing with real-time logistics data has substantially improved transaction traceability, audit efficiency, and risk-based enforcement, thereby reducing opportunities for fraudulent ITC claims and fictitious supply chains. Nonetheless, persistent challenges – including fragmented data architecture, interoperability constraints, uneven technological adoption, and compliance burdens among small and medium-sized enterprises (SMEs) – continue to limit the effectiveness of the digital compliance ecosystem.

The study extends the literature on forensic accounting and digital tax governance by developing a forensic framework for assessing ITC-related risks within technology-enabled tax administration. It further provides policy insights into the design of integrated digital compliance systems, highlighting the importance of interoperable data infrastructure and analytics-driven enforcement for improving tax integrity and strengthening revenue administration in emerging economies.

KEYWORDS: *Input Tax Credit; Forensic Accounting; Tax Compliance; Digital Tax Administration; GST; RFID; FASTag; E-Way Bill*

JEL Classification: *H25; H26; M41; M48*

State / UT	FY 2022-23 (₹ crore)	FY 2023-24 (₹ crore)	FY 2024-25 (₹ crore)
Delhi	55,843	66,445	70,863
Haryana	86,668	1,02,914	1,08,714
Uttar Pradesh	87,970	1,01,693	1,02,256
West Bengal	58,060	62,613	61,065
Tamil Nadu	—	—	—
Source: GST revenue state/UT collection data (does not specify ITC amount).			

The details of growth of GST collection since implementation is as per the table below:

	Gross Revenue (in Rs. Crores)	% Growth (y-o-y)
2017-18*	7,40,650	
2018-19	11,77,368	$
2019-20	12,22,116	3.80%
2020-21	11,36,805	-7.00%
2021-22	14,83,291	30.50%
2022-23	18,07,680	21.90%
2023-24	20,18,249	11.60%
2024-25 (upto Feb 25)	20,12,720	$

** 9 months only as GST implemented w.e.f. 1st July, 2017 {$ Y-o-Y growth not comparable}*

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State/UT-wise Financial Year-wise Gross GST Collection (Rs in Crores)

State Code	State	FY 2022-23	FY 2023-24	FY 2024-25 (Till Feb' 25)
		Total	Total	Total
1	Jammu and Kashmir	5,246	6,704	6,580
2	Himachal Pradesh	8,778	9,956	9,523
3	Punjab	20,949	24,061	24,550
4	Chandigarh	2,365	2,771	2,675
5	Uttarakhand	16,845	19,231	18,928
6	Haryana	86,668	1,02,914	1,08,714
7	Delhi	55,843	66,445	70,863
8	Rajasthan	45,458	50,174	49,286
9	Uttar Pradesh	87,970	1,01,693	1,02,256
10	Bihar	16,548	18,021	17,609
11	Sikkim	3,156	3,707	3,714
12	Arunachal Pradesh	1,023	1,308	1,027
13	Nagaland	566	711	597
14	Manipur	615	670	642
15	Mizoram	419	500	466
16	Tripura	884	1,053	1,034
17	Meghalaya	2,076	2,260	1,924
18	Assam	13,710	15,602	15,707
19	West Bengal	58,060	62,613	61,065
20	Jharkhand	32,019	34,738	33,533
21	Odisha	49,442	54,748	55,119
22	Chhattisgarh	31,968	34,874	33,462
23	Madhya Pradesh	36,232	42,174	40,899
24	Gujarat	1,14,221	1,25,168	1,24,654
25	Daman and Diu	3	3	2
26	Dadra and Nagar Haveli	3,771	4,333	4,023
27	Maharashtra	2,70,346	3,20,117	3,28,321
29	Karnataka	1,22,822	1,45,266	1,46,066
30	Goa	5,520	6,475	6,466
31	Lakshadweep	21	45	18
32	Kerala	27,371	30,677	30,280
33	Tamil Nadu	1,04,377	1,21,329	1,19,320
34	Puducherry	2,373	2,636	2,614
35	Andaman and Nicobar Islands	373	428	431
36	Telangana	51,831	59,942	57,586
37	Andhra Pradesh	40,232	44,298	40,791
38	Ladakh	333	481	497
97	Other Territory	2,609	2,615	2,252
99	Center Jurisdiction	1,941	2,506	2,985
	GST Collection (Domestic)	**13,24,985**	**15,23,248**	**15,26,476**
	Imports	4,82,695	4,95,001	4,86,244
	Total GST Collection	**18,07,680**	**20,18,249**	**20,12,720**

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Growth of Gross GST revenue (domestic) collected from the States in 11 months of FY 2024-25 (Rs in Crores)

State Code	State/UT	2023-24 (till Feb,2024)	2024-25 (till Feb, 2025)	Growth
27	Maharashtra	292429	328321	12%
29	Karnataka	132252	146066	10%
24	Gujarat	113776	124654	10%
33	Tamil Nadu	110312	119320	8%
6	Haryana	93369	108714	16%
9	Uttar Pradesh	92606	102256	10%
7	Delhi	60625	70863	17%
19	West Bengal	57140	61065	7%
36	Telangana	54543	57586	6%
21	Odisha	49639	55119	11%
8	Rajasthan	45376	49286	9%
23	Madhya Pradesh	38200	40899	7%
37	Andhra Pradesh	40216	40791	1%
20	Jharkhand	31495	33533	6%
22	Chhattisgarh	31731	33462	5%
32	Kerala	28079	30280	8%
3	Punjab	21971	24550	12%
5	Uttarakhand	17501	18928	8%
10	Bihar	16029	17609	10%
18	Assam	14058	15707	12%
2	Himachal Pradesh	9104	9523	5%
1	Jammu and Kashmir	6103	6580	8%
30	Goa	5910	6466	9%
26	Dadra and Nagar Haveli	3881	4023	4%
11	Sikkim	3404	3714	9%
99	Center Jurisdiction	2286	2983	30%
4	Chandigarh	2533	2675	6%
34	Puducherry	2415	2614	8%
97	Other Territory	2419	2252	-7%
17	Meghalaya	2047	1924	-6%
16	Tripura	933	1034	11%
12	Arunachal Pradesh	1140	1027	-10%
14	Manipur	601	642	7%
13	Nagaland	629	597	-5%
38	Ladakh	440	497	13%
15	Mizoram	450	466	4%
35	Andaman and Nicobar Islands	396	431	9%
31	Lakshadweep	43	18	-58%
25	Daman and Diu	2	2	-22%

LITERATURE REVIEW

1. Conceptual Framework of GST and Input Tax Credit (ITC)

The Goods and Services Tax (GST) regime in India was introduced with the objective of eliminating cascading effects of taxation and creating a seamless flow of Input Tax Credit (ITC) across the supply chain. ITC acts as the backbone of GST by allowing registered taxpayers to offset tax paid on inputs against output tax liability, thereby improving liquidity and compliance efficiency

(Mukherjee, 2019). Several scholars emphasize that while ITC enhances tax neutrality and competitiveness, it also opens avenues for tax evasion through fraudulent credit claims (Thakkar et al., 2024).

Early studies on GST focused largely on macro-level efficiency gains, compliance costs, and revenue performance, with limited attention to micro-level ITC behaviour (Rao & Chakraborty, 2017). However, with the expansion of GST data analytics and enforcement actions, ITC claims have emerged as a critical area of forensic scrutiny.

2. Nature and Typologies of GST ITC Fraud

Recent literature identifies fake invoicing, circular trading, shell entities, and bogus firms as dominant mechanisms used to fraudulently claim ITC (Thakkar et al., 2024). These studies highlight that ITC fraud often exploits the invoice-matching mechanism and inter-state supply chains under IGST, making detection complex.

Mukesh and Shobha (2024) classify GST evasion patterns into documentation fraud, transaction layering, and identity misuse, with ITC manipulation being the most revenue-intensive form of evasion. The literature suggests that the misuse of ITC not only results in revenue leakage but also distorts competition by enabling non-compliant firms to undercut compliant businesses.

3. Forensic Accounting Perspective on GST ITC Claims

From a forensic accounting standpoint, GST ITC fraud is increasingly viewed as a form of structured financial crime, requiring investigative techniques beyond traditional audits. Trivedi et al. (2024) emphasize the growing role of forensic accountants in indirect taxation, particularly in tracing fake billing networks, analysing abnormal credit ratios, and identifying benami registrations. Forensic studies underline the relevance of red-flag indicators such as disproportionate ITC-to-turnover ratios, repeated amendments in returns, circular supplier relationships, and sudden spikes in credit claims (Trivedi et al., 2024). These indicators form the basis for risk-based scrutiny adopted by tax authorities.

4. Data Analytics, Machine Learning, and Technology-Driven Detection

A significant stream of recent research applies machine learning (ML) and data mining techniques to detect GST fraud, including ITC misuse. Studies employing decision trees, support vector machines (SVM), and clustering techniques demonstrate higher predictive accuracy in identifying anomalous ITC claims compared to rule-based systems (JETIR, 2021).

Graph-based models and network analysis have gained prominence for detecting circular trading and layered transactions, which are common in ITC fraud cases (Mehta et al., 2022). These approaches treat GST transactions as interconnected networks, enabling authorities to identify suspicious clusters of firms engaged in artificial credit generation.

International VAT fraud studies (Alexopoulos et al., 2021) further validate the applicability of network analytics and AI-based detection tools in GST environments, reinforcing the shift toward technology-enabled forensic tax audits.

5. Regulatory and Enforcement-Oriented Studies

Policy-oriented literature evaluates the effectiveness of GST enforcement mechanisms such as e-invoicing, RFID, FASTag integration, and data sharing between GSTN and other agencies. Scholars argue that technological interventions significantly reduce the scope for fake ITC claims by improving traceability and invoice authentication (Mukherjee, 2019).

Parliamentary disclosures and secondary analyses indicate a rising trend in detected ITC fraud cases, reflecting both increased enforcement capacity and persistent compliance challenges. However, researchers note a lack of publicly available state-wise ITC claim data, limiting granular empirical analysis (Mukesh & Shobha, 2024).

6. Research Gaps Identified in Existing Literature

Despite growing scholarship, several gaps remain:

1. Limited state-wise or sector-wise empirical studies on legitimate versus fraudulent ITC claims.
2. Over-reliance on conceptual or secondary data, with fewer firm-level forensic case studies.
3. Insufficient integration of forensic accounting theory with GST compliance analytics.
4. Lack of longitudinal studies assessing the impact of technological interventions on ITC fraud reduction.

These gaps justify further forensic and empirical investigation into GST ITC claims using advanced analytics and regulatory data.

7. Positioning of the Present Study

Building on prior research, the present study aims to bridge the gap between forensic accounting techniques and GST ITC analytics, with a focus on identifying abnormal credit behaviour and evaluating the effectiveness of technology-driven controls. By integrating forensic indicators with GST compliance data, the study contributes to both academic literature and policy-oriented discussions on indirect tax fraud prevention.

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HYPOTHESIS DEVELOPMENT

1. GST ITC Claims and Forensic Risk

Input Tax Credit (ITC) is central to the functioning of the GST framework, enabling seamless credit flow across the supply chain. However, prior studies suggest that excessive or abnormal ITC claims are often associated with higher probabilities of tax evasion and fraudulent behaviour (Thakkar et al., 2024; Mukesh & Shobha, 2024). From a forensic accounting perspective, disproportionate ITC-to-turnover ratios signal potential manipulation of invoices, circular trading, or shell entity operations.
Accordingly, higher ITC intensity may act as a forensic red-flag indicator of non-compliance.
H1: *There is a positive relationship between abnormal ITC claims and the likelihood of GST non-compliance.*

2. ITC Claims and Firm-Level Financial Characteristics

Literature in forensic accounting suggests that firms with weak financial fundamentals or liquidity constraints are more prone to engage in aggressive tax behaviour to manage cash flows (Trivedi et al., 2024). High leverage, declining profitability, and irregular return filing patterns may incentivise firms to inflate ITC claims to reduce tax outflows.
Thus, firm-level financial stress is expected to influence ITC claim behaviour.
H2: *Firms experiencing financial stress exhibit significantly higher ITC claims relative to their reported turnover.*

3. Circular Trading Networks and ITC Misuse

Recent studies highlight the role of **circular trading networks** in facilitating fraudulent ITC claims through interconnected entities issuing fake or inflated invoices (Mehta et al., 2022). Network-based forensic analysis shows that firms embedded in dense supplier-buyer loops are more likely to participate in artificial credit generation.
Therefore, network complexity is expected to be positively associated with ITC misuse.
H3: *Firms involved in circular or highly interconnected trading networks are more likely to engage in abnormal ITC claims.*

4. Technology-Enabled Controls and ITC Compliance

The introduction of technological interventions such as **e-invoicing, GSTR-2B auto-population, RFID-based logistics tracking, and FASTag integration** has strengthened transaction traceability under GST. Prior policy-oriented research suggests that such measures reduce the scope for fake invoicing and improve ITC authenticity.
Hence, technological adoption is expected to moderate the relationship between ITC claims and fraud risk.
H4: *Technology-enabled GST compliance mechanisms significantly reduce the incidence of abnormal ITC claims.*

5. Sectoral Variation in ITC Claims and Forensic Risk

Empirical studies indicate that ITC misuse is more prevalent in sectors characterized by complex supply chains, high inter-state transactions, and fragmented vendor bases (e.g., construction, metals, trading, logistics). Such sectors provide greater opportunities for invoice manipulation and credit layering.
Accordingly, forensic risk is expected to vary across industries.
H5: *The likelihood of abnormal ITC claims differs significantly across industrial sectors.*

6. Enforcement Intensity and ITC Behaviour

Economic deterrence theory suggests that higher enforcement intensity increases compliance by raising the expected cost of non-compliance. Increased GST audits, cancellation of registrations, and penalties are expected to discourage aggressive ITC claims.
Thus, enforcement acts as a behavioural constraint on ITC misuse.
H6: *Increased GST enforcement intensity is negatively associated with abnormal ITC claims.*

7. Integrated Forensic Analytics and Detection Effectiveness

Studies applying machine learning and forensic analytics demonstrate superior fraud detection performance compared to traditional rule-based audit systems (Alexopoulos et al., 2021). Integrating financial ratios, network metrics, and compliance indicators is expected to enhance detection accuracy.
H7: *Integrated forensic analytics models exhibit higher accuracy in detecting abnormal ITC claims than traditional audit approaches.*

Hypotheses Summary Table -

Hypothesis	Statement
H1	Abnormal ITC claims are positively associated with GST non-compliance
H2	Financially stressed firms claim higher ITC
H3	Circular trading increases ITC misuse
H4	Technology adoption reduces abnormal ITC
H5	ITC misuse varies across sectors
H6	Enforcement intensity reduces ITC misuse
H7	Forensic analytics improves detection accuracy

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Official GST & ITC Fraud Statistics (India)

1. Detected GST evasion and ITC fraud (FY 2020-21 to 2024-25)

• Over **₹7.08 lakh crore (~₹7.08 trn)** of GST evasion detected over five years (2020-21 to 2024-25).
• Within this, **₹1.79 lakh crore (~₹1.79 trn)** was attributable to **ITC fraud**.
• In **FY 2024-25 alone**, GST evasion detection was **₹2.23 lakh crore**, with **15,283 cases** of ITC fraud detected valuing **~₹58,772 crore**.
• Earlier fiscal years also showed rising ITC fraud involvement — ₹36,374 crore in FY 2023-24 and ₹24,140 crore in FY 2022-23.

2. Fake registrations & bogus firms

• In a special drive till December 2023, **29,273 bogus firms** were detected involved in suspected ITC fraud of **₹44,015 crore**, protecting revenue worth around **₹4,646 crore**.

1. **Trend of ITC fraud value (₹ crores) FY 2020-21 → FY 2024-25**
2. **Trend of total GST evasion detected**
3. **Cases of bogus firms detected over time**

Linear Regression Model:
ITC_Fraud_Value ↔ Fiscal Year

Estimated regression equation:

ITC_Fraud = α + β × Year

(β – trend coefficient showing annual increase)

Based on five-year series (2020-21 to 2024-25), it is projected:

Fiscal Year	Projected ITC Fraud (₹ crores)
2025-26	forecast based on trend
2026-27	forecast based on trend

Flow elements:

- GST Tax Base & ITC Claims
- E-Invoicing & Invoice Matching
- RFID / FASTag / E-Way Bill Data Streams
- Risk Analytics & Anomaly Detection
- Enforcement Response & Revenue Protection

1) How does ITC fraud detection compare pre- and post-digital interventions?

Pre-Digital / Traditional Era:

Manual, paperwork-dependent systems: Customs and trade authorities historically relied on *physical documentation*, manual inspections, and human analysis to detect tax fraud or illicit trade entries. This is often meant slow detection cycles, high labor costs, and delayed enforcement.

Limited real-time analytics: Without digital data flows or automated monitoring, fraud schemes like document falsification and duplicate financing went undetected for extended periods. This is a consistent theme in trade finance literature pointing to information silos as a root cause of fraud risk.

Post-Digital Interventions:

Data-driven analytics and machine learning: Modern fraud detection now incorporates *machine learning models* that detect patterns and anomalies across large transactional datasets — for example, credit card or e-commerce transaction monitoring using ensemble and deep learning methods that significantly improve detection accuracy compared to rule-based systems.

Cross-institution knowledge sharing: Research in customs fraud suggests that *domain adaptation and shared knowledge platforms* across customs administrations can multiply fraud detection effectiveness by 2–11 times relative to isolated, manual systems.
Blockchain and digital ledgers: Digitized trade documents (e-bills of lading, registry records) and cryptographically secured records reduce opportunities for duplicate or fabricated documents because they can be verified instantly and unambiguously across parties, cutting the window for fraud.

Net Comparison:
Speed & Scale: Digital systems detect fraud in near real-time versus pre-digital lag times of days/weeks.
Accuracy: Machine learning and anomaly detection greatly reduce false positives/negatives relative to static rule-based work.
Cross-boundary verification: Shared digital platforms reduce fraud success stemming from information silos and paper gaps.
In essence: digital interventions transform detection from laborious, isolated workflows to scalable, analytics-enabled platforms that spot complex fraud patterns much earlier and more reliably.

2) What are the limitations of RFID/FASTag data in logistics verification?
RFID / FASTag Context:
RFID (Radio-Frequency Identification) systems — including India's FASTag electronic toll payments — provide automated tracking and identification data for vehicles or assets. Used in logistics, these data can signal *presence and movement* of goods or transport units across nodes.
Key Limitations (from literature & system analyses):
a) Data Accuracy & Reliability
Signal interference and reader errors: RFID tags and readers can misread or drop data due to *physical interference, density of tags*, or hardware faults. This can lead to missing or incorrect location/time data.
Initial implementation issues: In early FASTag deployments, RFID readers sometimes failed or required manual interventions, undermining system reliability.
b) Granularity & Scope
Limited positional detail: RFID/FASTag logs generally report *checkpoint points* rather than continuous GPS trajectories, reducing visibility into actual route dynamics or mid-segment deviations.
Ownership linking errors: For vehicle-specific tags like FASTag, changes in ownership or improper tag linkage can corrupt identity data if not updated promptly.
c) Security and Data Gaps
Security vulnerabilities: RFID systems without strong encryption can be subject to cloning, spoofing, or unauthorized reads — undermining trust in verification.
Incomplete behavior visibility: A tag only shows presence at readers — it doesn't automatically capture *contextual logistics state* (e.g., cargo condition, tampering). This limits verification of end-to-end chain integrity.
d) Integration Challenges
Systems interoperability: RFID data on its own needs integration with enterprise systems (ERP, WMS) and analytics platforms for meaningful verification. Without that, raw tag reads are hard to turn into actionable logistics compliance signals.
Summary:
RFID/FASTag data bring automation and checkpoint visibility, but limitations in reliability, data richness, security, and context mean they must often be combined with other digital sources (telemetry, blockchain, IoT sensors) to yield robust logistics verification.

3) How do regression projections support policy decisions?
Role of Regression in Policy (Evidence & Mechanisms):
a) Forecasting & Scenario Analysis
Regression models quantify relationships between observable socio-economic variables and outcomes of interest, providing numerical forecasts that *inform policy trade-offs*. For example:
Economic indicators forecasting: Regression models estimate how changes in tax rates, employment, or spending might correlate with GDP or inflation trends.
Scenario planning: By inputting different predictor values (e.g., stimulus amounts), policymakers can project outcomes under alternative policy scenarios.
b) Understanding Drivers & Magnitudes
Regression coefficients represent how much dependent outcomes change per unit change in a predictor, giving leaders *quantified effect sizes* (e.g., how much a subsidy affects output).
c) Evaluation & Benchmarking
Governments and agencies use regression to *benchmark performance* against expected norms — e.g., comparing actual unemployment trends against what past data would forecast — revealing when policies are underperforming.
d) Evidence-Based Formulation
Regression allows disentangling correlated influences, so decision-makers better understand causal hypotheses (though true causal inference requires careful design). This supports targeting of resources where effects are strongest.
e) Cautions in Policy Use
Econometrics literature cautions that models based purely on historical correlations can mislead if underlying relationships shift due to policy change (e.g., Lucas critique), so policymakers often combine regression with theory and structural modeling.
Practical Example (General):
A regression forecasting model could estimate how a 1% change in trade tariffs would impact export volumes, helping finance ministries choose duty levels that balance revenue and competitiveness (this is a standard econometric forecasting use case).

REFERENCES

1. GST Fraud: Modus Operandi of Input Tax Credit Schemes

- *Himanshu Thakkar, Vedanshi Joshi & Rishita Bhatt.* ***GST Fraud: Unveiling the Modus Operandi of Input Tax Credit Fraud Schemes.***
  – Focus: Fake billing, shell firms, and how GST ITC frauds are perpetrated in India. Provides qualitative insights into fraud mechanisms.
  DOI: *10.47413/vidya.v3i1.357*
  (Published in "VIDYA – A Journal of Gujarat University", 2024)

2. Machine Learning for Detecting GST Fraud

- ***Detecting GST Fraud Through Machine Learning Techniques (JETIR / IJSART).***
  – Studies ML methods (decision trees, clustering) to uncover anomalous GST transactions and fraudulent ITC patterns.

3. Comparative Analysis of SVM Models for GST Fraud Prediction

- ***Comparative Analysis of SVM Variants for GST Fraud Detection.***
  – Focuses on several Support Vector Machine (SVM) models to predict fraud within GST datasets, including possible ITC anomalies.

4. Case Study on GST Tax Evasion Patterns in India

- *Helly Mukesh & Shobha V.* ***Case Studies on GST Tax Evasion: Patterns, Impacts, and Regulatory Responses in India (JES, 2024).***
  – Covers fictitious invoicing and misuse of input tax credit via case analyses.

5. Forensic Role in Tax Scams (Direct & Indirect Tax)

- *Romil Trivedi, Yashkumar Patel, Akhil Manoj.* ***Forensic Role in Detecting Scams in Direct and Indirect Taxes (IJCRT, 2024).***
  – Highlights the broader forensic techniques applicable to indirect tax fraud (including GST/ITC).

6. Graph Representation for Detecting Tax Evasion Patterns

- *Priya Mehta et al.* ***Representation Learning on Graphs to Identifying Circular Trading in GST.***
  – Uses graph models to detect circular trading (a common mode of GST evasion).

7. Algorithmic Detection of Tax Evasion Patterns

- *Jithin Mathews et al.* ***An Algorithmic Approach to Handle Circular Trading in Commercial Taxing Systems.***
  – Proposes algorithms to detect complex fraudulent trading structures relevant for ITC misuse detection.

8. Tax Fraud Detection in Other Tax Domains

- *Angelos Alexopoulos et al.* ***A Network and Machine Learning Approach to Detect Value Added Tax (VAT) Fraud.***
  – Presents ML methods to detect fraud in VAT — conceptually relevant to GST/ITC analytics.

9. Bibliometric and Forensic Accounting Research Trends

- *SAARC financial crime research overview.*
  – Highlights the growth of forensic accounting research, tax evasion detection, and data analytics (useful for literature review sections).