



INTERNATIONAL LAW
JOURNAL

**WHITE BLACK
LEGAL LAW
JOURNAL
ISSN: 2581-
8503**

Peer - Reviewed & Refereed Journal

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**THE PARADOX OF ZERO-FEE DIGITAL PAYMENTS:
EVALUATING THE SECURITY AND GOVERNANCE
IMPLICATIONS OF REINTRODUCING MDR IN INDIA'S
UPI ECOSYSTEM**

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Abstract

The Unified Payments Interface (UPI) has emerged as the cornerstone of India's digital public infrastructure, facilitating over 18.3 billion monthly transactions and positioning the nation as a global leader in real-time payments. However, this expansion is currently challenged by the "Paradox of Zero-Fee Digital Payments": the mandate of zero Merchant Discount Rate (MDR), which catalyzed universal adoption, now threatens the ecosystem's long-term sustainability, security, and governance. As transaction volumes scale toward a projected 150 billion per month, the structural funding gap—where government incentives cover only 11% of actual industry costs—has created systemic vulnerabilities.

This research paper evaluates the implications of the current zero-revenue regime through the lens of the Thirty-Second Report of the Standing Committee on Finance (March 2026). It identifies a critical "governance gap" where a focus on user acquisition has masked "glaring failures" in KYC protocols and real-time monitoring, leading to the proliferation of mule accounts and digital fraud. Furthermore, the study analyzes the transformation of security into a "cost center," documenting how infrastructure strain results in approximately 4.8 million technical declines daily.

Drawing on comparative benchmarks like Brazil's Pix model, this paper argues for a strategic pivot toward a "Graded MDR" mechanism. It recommends a tiered revenue architecture that maintains free access for micro-merchants while introducing nominal charges for high-value transactions to fund essential investments in AI-driven fraud detection and the "Golden Hour" of fraud prevention. Ultimately, the paper concludes that financial sustainability is not a

commercial preference but a prerequisite for the institutional resilience and cybersecurity required to safeguard India's digital future.

Keywords: *Unified Payments Interface (UPI), Merchant Discount Rate (MDR), Financial Sustainability, Cybersecurity, Digital Public Infrastructure (DPI).*

1. Introduction

The Unified Payments Interface (UPI), launched in 2016 by the National Payments Corporation of India (NPCI), has transitioned from a fintech experiment into the primary financial circulatory system of the Indian economy. By March 2025, UPI transaction volumes reached a staggering 18.3 billion per month, with values touching ₹24.77 trillion.¹ This exponential growth, representing a compound annual growth rate (CAGR) of over 70% since inception, has positioned India as a global leader in real-time payments, accounting for nearly 49% of global transactions in 2024.²

However, this success is underpinned by a contentious regulatory framework: the "Zero-MDR" (Merchant Discount Rate) mandate. Enacted in January 2020 through amendments to Section 10A of the Payment and Settlement Systems Act, 2007, and Section 269SU of the Income-tax Act, 1961, the policy prohibits banks and payment service providers (PSPs) from levying any charges on merchants or customers for UPI and RuPay debit card transactions.³ The Government of India has consistently defended this stance by characterizing UPI as a "Digital Public Good" (DPG), analogous to physical infrastructure like roads, which should be accessible to all citizens at zero cost to maximize social benefit and drive financial formalization.⁴

The "Paradox of Zero-Fee Digital Payments" arises from the mismatch between this public-good philosophy and the private-sector costs of maintaining the system. While the Zero-MDR policy has undeniably catalysed universal adoption, reaching a 94% adoption rate among small vendors by 2025⁵ it has created a structural funding gap that threatens the very infrastructure it seeks to promote. By March 2026, the Standing Parliamentary Committee on Finance highlighted a critical inflection point: the government's incentive schemes currently cover only 11% of the actual operational costs incurred by the industry.⁶

This fiscal imbalance has profound implications for two critical pillars of the India Stack: Governance and Security. In a zero-revenue environment, the incentives for Payment Service Providers and banks to invest in high-end cybersecurity, real-time fraud monitoring, and robust dispute resolution mechanisms are severely curtailed.⁷ The Thirty-Second Report of the Standing Committee on Finance (March 2026) identified "critical systemic failures" in Know Your Customer (KYC) protocols and real-time monitoring, leading to the proliferation of "mule accounts" used for laundering the proceeds of crime.⁸

This paper evaluates the security and governance risks inherent in the current zero-fee regime and analyzes the parliamentary recommendation to reintroduce a "graded MDR" mechanism. It argues that for UPI to scale toward the projected 150 billion transactions per month, the policy must pivot from a blanket zero-fee mandate to a sustainable revenue model that balances inclusion with institutional resilience.⁹

2. The Governance Gap: From Acquisition to Accountability

The governance of India's digital payment ecosystem has historically been defined by an aggressive "acquisition-first" strategy. Following the 2016 demonetization, the primary metric of success for the Ministry of Finance and the NPCI was the rapid onboarding of users and the proliferation of Jan Dhan accounts. However, the 32nd Report of the Standing Committee on Finance (March 2026) signalled a necessary paradigm shift, arguing that the focus on mere account acquisition has reached a point of diminishing returns, creating a significant "governance gap."¹⁰

2.1 The Pivot from Acquisition to Active Utilization

The Committee observed that while India has successfully "banked the unbanked," a substantial portion of these accounts remains dormant or is used only for one-off transactions. The panel urged the government to "officially pivot its policy focus from mere account acquisition to active usage, increased digital literacy and sustained, outcome-based financial utilization."¹¹ This recommendation acknowledges that the "activation layer" of the India Stack where UPI transforms a dormant bank account into a usable financial tool is currently under-optimized.¹² Governance, in this new phase, must be measured by the depth of financial integration rather than the breadth of the user base.

2.2 Systemic Failures in KYC and Oversight

A more alarming aspect of the current governance framework is the identified "glaring failure in Know Your Customer (KYC) and real-time monitoring."¹³ The Committee's 2026 findings highlighted that the rapid scale of UPI has outpaced the oversight capabilities of individual bank branches, allowing the formal banking system to be exploited for laundering the proceeds of crime.¹⁴

This failure is directly linked to the revenue paradox: without a sustainable income stream from transactions, banks have little incentive to invest in the advanced AI-driven monitoring systems required to detect "mule accounts" in real-time.¹⁵ To bridge this accountability gap, the Committee proposed a novel "Penal Framework for Negligent Branches," where banks hosting multiple fraudulent accounts would face direct statutory penalties, moving the burden of security from the regulator to the individual institution.¹⁶

2.3 Legislative Accountability at the District Level

The existing governance structure for digital payments is largely centralized, driven by the RBI and NPCI. The 2026 report seeks to decentralize this accountability by recommending that the District Consultative Committees (DCCs), which oversee the local implementation of financial schemes be presided over by the "senior-most Member of Parliament (MP) of the district."¹⁷ This proposal aims to inject "legislative accountability" into the digital India mission at the grassroots level, ensuring that the implementation of digital literacy and fraud awareness programs is subject to local political oversight and responsiveness.¹⁸

2.4 Market Concentration and the Oligopoly Risk

Finally, the governance framework faces a structural challenge regarding market concentration. Despite UPI being an open protocol, the ecosystem has matured into a de facto oligopoly where three Third-Party Application Providers (TPAPs) PhonePe, Google Pay, and Paytm control the vast majority of transaction volumes.¹⁹ The Zero-MDR environment reinforces this concentration because the payments layer yields little profit, only entities with deep venture capital or diversified revenue streams can afford the massive overheads of compliance and user acquisition.²⁰ This concentration creates a systemic "single point of failure" risk, where a technical outage at a single TPAP could disrupt the retail commerce of the entire nation.²¹ Governance, therefore, must now address how to foster a more competitive and fragmented market without compromising the seamless interoperability that defines the platform.²²

3. Security as a Cost Center

In the traditional architecture of financial services, security and infrastructure are viewed as foundational investments necessary to protect revenue-generating streams. However, under India's Zero-MDR mandate, where the "payments layer" itself produces no direct revenue, these critical functions have been relegated to "cost centers."²³ This fiscal positioning creates a dangerous incentive structure: as transaction volumes surge toward the 150-billion-per-month milestone, the capital required to maintain low-latency, high-security rails is increasingly unavailable to the banks and Payment Service Providers (PSPs) responsible for the system's integrity.²⁴

3.1 Technical Declines and Infrastructure Strain

The technical integrity of UPI relies on the seamless orchestration of the NPCI central switch, the remitter bank's Core Banking System (CBS), and the beneficiary bank's infrastructure. As of 2025, the system handles over 600 million transactions daily; however, this scale has exposed significant "infrastructure scalability" risks.²⁵

A primary metric of this strain is the "Technical Decline" (TD) rate failures caused by system unavailability, network timeouts, or host downtime, rather than user error or insufficient funds.²⁶ Industry data from 2024-25 indicates that even a seemingly marginal TD rate of 0.8% translates into more than 4.8 million transaction failures every single day.²⁷ These failures do more than merely inconvenience users; they erode the "systemic trust" necessary for digital adoption in rural areas, where a single failed transaction can represent a significant portion of a user's daily liquidity.²⁸

To address this, the NPCI mandated a significant reduction in response times for key APIs (Application Programming Interfaces) starting June 16, 2025.²⁹ The response time for "Request Pay" and "Check Transaction Status" was cut from 30 seconds to just 15 and 10 seconds, respectively.³⁰ While these faster turnaround times improve the user experience, they require banks to drastically upgrade their backend hardware and concurrency-handling capabilities. In a zero-revenue environment, many medium and small-sized banks struggle to fund these upgrades, leading to "back-loaded" spending and a reliance on aging legacy systems that are inherently more vulnerable to outages and exploits.³¹

3.2 The "Golden Hour" and the Crisis of Fraud Prevention

The March 2026 Thirty-Second Report of the Standing Committee on Finance identified

"critical systemic failures" in the formal banking system's ability to combat digital fraud.³² The Committee emphasized the concept of the "Golden Hour" the critical three-to-four-hour window immediately following a fraudulent transaction during which funds can be frozen before they are laundered out of the formal ecosystem.³³

The report highlighted a "glaring failure" in real-time monitoring, noting that the current zero-fee regime has left banks without the fiscal capacity to deploy the advanced, AI-driven fraud scoring engines required for instantaneous intervention.³⁴ Consequently, the banking system has become a conduit for "mule accounts" accounts opened with compromised or falsified KYC (Know Your Customer) data to facilitate the movement of crime proceeds.³⁵ To combat this, the Committee recommended a "Penal Framework for Negligent Branches," shifting the liability for these failures onto the individual bank branches that host multiple mule accounts.³⁶ This move effectively attempts to use statutory penalties to compel the investment in security that the market (under Zero-MDR) fails to incentivize.

3.3 Biometric Evolution and High-Concurrency Security

In October 2025, India introduced biometric authentication for UPI, allowing facial recognition and fingerprinting to replace the traditional numeric PIN.³⁷ This evolution was intended to mitigate the risks of "social engineering" and "phishing," which remain the most prevalent forms of digital theft in India.³⁸ While biometric layers enhance security, they also impose a massive "computational tax" on the system. Processing 10,000 biometric-authenticated transactions per second requires significantly more cloud-based data processing and secure hardware security modules (HSM) than traditional PIN-based methods.

Furthermore, as "UPI Circle" allows for delegated payments (up to ₹15,000 per month for secondary users), the complexity of risk checks and "AI-driven risk-based authentication" (RBA) must increase to prevent unauthorized secondary access. In a sustainable model, these costs would be offset by transaction fees. In the current Zero-MDR model, the industry relies on an annual government incentive of approximately ₹2,000 crore to ₹4,000 crore, a figure that the Payments Council of India (PCI) argues "chokes the ecosystem," as it represents only a fraction of the ₹15,000 crore required for comprehensive infrastructure and security maintenance.³⁹

3.4 The Sustainability of Trust

Ultimately, the security of a payment system is not a static feature but a dynamic capability that requires constant capital infusion. The "Security as a Cost Center" paradigm risks a gradual

decay of the UPI ecosystem's resilience. If PSPs and banks cannot monetize the "safety" they provide, the incentive to maintain 99.5% uptime and low TD rates diminishes, potentially leading to a "spiral of mistrust" where users return to cash to avoid the risks of technical failure and unrecovered fraud.⁴⁰ The Committee's 2026 findings serve as a stark warning: without a viable revenue mechanism, the "Digital Public Good" of UPI may eventually collapse under the weight of its own uncompensated security requirements.

4. The Economic Impact of Graded MDR

The economic framework of India's digital payments is currently governed by a "Corner Solution" where the price of the service to the merchant is mandated at zero. While this has successfully internalised the network externalities typical of two-sided markets, where the value for one side (merchants) increases with the participation of the other (consumers), it has created a profound fiscal imbalance.⁴¹ The 32nd Parliamentary Report of March 2026 suggests that the transition to a sustainable "Graded MDR" model is no longer a commercial request but a macroeconomic necessity to prevent the atrophy of the payments infrastructure.⁴²

4.1 Quantifying the Revenue Deficit and Subsidy Shortfall

The industry's financial strain is evidenced by the stark disparity between operational costs and state support. Industry analyses from 2024-25 estimate the combined cost for all Payment Service Providers (PSPs) and banks to process Person-to-Merchant (P2M) transactions at approximately 0.25% of the transaction value.⁴³ Given that UPI P2M values reached ₹213.8 trillion by January 2025, the estimated annual cost to the ecosystem stands between ₹10,000 crore and ₹15,000 crore.⁴⁴

In contrast, the Government's budgetary support has been consistently inadequate. For the 2026-27 fiscal year, the Union Budget allocated only ₹2,000 crore for the UPI and RuPay incentive scheme a figure representing a 9% reduction from the revised estimate of the previous year.⁴⁵ The Standing Committee on Finance observed that this incentive covers a mere 11% of the industry's actual costs and only 14% of what could be collected through a regulated MDR.⁴⁶ This shortfall forces non-bank PSPs (Third-Party Application Providers) to cross-subsidize their payment operations through other business lines, such as lending or insurance, which may not be sustainable for smaller fintech entrants.⁴⁷

4.2 The Proposed Graded MDR Models

To address this deficit, the Parliamentary Committee and industry bodies like the Payments Council of India (PCI) have proposed two primary tiered revenue models:

- 1. The Threshold-Based (Slab) Model:** This model leverages the fact that a small number of high-value transactions account for the majority of the total volume. In early 2022, 78% of P2M payments were below ₹500, yet 70% of the total transaction *value* was derived from payments exceeding ₹2,000.⁴⁸ Proponents argue that transactions below ₹2,000 should remain under the Zero-MDR regime to protect micro-merchants, while a nominal MDR (e.g., 0.3%) could be introduced for higher-value transactions. This mirrors the existing precedent of the 1.1% interchange fee introduced in 2023 for UPI merchant payments exceeding ₹2,000 made through Prepaid Payment Instruments (PPI) wallets.⁴⁹
- 2. The Turnover-Based Model:** Similar to the existing regulation for debit cards, this model would classify merchants based on their annual turnover. Merchants with an annual turnover below ₹20 lakh or ₹40 lakh would continue to accept UPI at zero cost.⁵⁰ Large merchants (above ₹40 lakh) would be charged a regulated MDR. Industry advocates note that large enterprises already pay between 1.5% and 2% for credit card transactions and would likely absorb a 0.3% UPI fee, as it remains significantly cheaper than physical cash-handling costs.⁵¹

4.3 Market Dynamics and the Oligopoly Risk

The Zero-MDR policy has inadvertently contributed to market concentration, creating a high barrier to entry for new competitors. In a zero-margin environment, only "Big Tech" entities with massive capital reserves can withstand the compliance and user-acquisition costs.⁵² Consequently, the market is dominated by a few players, raising systemic "Too Big to Fail" risks.⁵³ The reintroduction of a nominal MDR would provide a sustainable revenue line for smaller, niche fintechs, encouraging market fragmentation and reducing the systemic vulnerability associated with having only 2-3 dominant TPAPs.

4.4 The Elasticity Problem: Consumer Sentiment and Adoption Risks

A critical constraint on the reintroduction of MDR is the extreme price sensitivity of the Indian consumer. A March 2025 survey by LocalCircles revealed that 73% of UPI users would stop using the platform if a transaction fee were introduced.⁵⁴ Furthermore, 40% of users reported having already experienced disguised fees or surcharges in the preceding 12 months, leading

to a degree of "fee fatigue."⁵⁵

This high elasticity of demand suggests that any revenue mechanism must be strictly structured as a B2B (Merchant-side) cost rather than a B2C (Consumer-side) fee. Global benchmarks, such as Brazil's **Pix**, provide a useful comparison: while individual transfers are free, the Central Bank of Brazil allows financial institutions to levy fees on merchants.⁵⁶ This has enabled Pix to maintain high adoption while simultaneously driving B2B usage, which now accounts for over 35% of all Pix transfer amounts a maturity level UPI has yet to achieve due to its revenue constraints.⁵⁷

4.5 Macroeconomic Formalization and Forecasting

From a macroeconomic perspective, the formalization of the economy driven by UPI is undeniable. Research indicates a strong correlation ($R^2=0.97$) between UPI transaction values and per capita private final consumption expenditure.⁵⁸ UPI has become a real-time proxy for the health of the Indian economy. However, if the infrastructure scalability is compromised due to the funding gap, the accuracy of this data as a predictive tool for policymakers will decline.⁵⁹ For UPI to serve as the engine for the "Viksit Bharat 2047" goal, the payments rail must be financially robust enough to facilitate not just payments, but the data-driven credit expansion required for MSME growth.⁶⁰

5. Recommendations & Conclusion

The unprecedented expansion of the Unified Payments Interface (UPI) has reached a structural limit where the "Zero-MDR" policy, once its greatest catalyst, now functions as a systemic constraint. The findings of the Thirty-Second Report of the Standing Committee on Finance (March 2026) confirm that the digital public good (DPG) model must evolve to remain resilient against fraud and technical failure.⁶¹ To reconcile the paradox of zero-fee digital payments with the need for a robust, self-sustaining ecosystem, the following original policy recommendations are proposed:

5.1 The "Hybrid Revenue" Model: Graded MDR

he government should transition from a blanket zero-MDR mandate to a **Tiered Revenue Architecture** that protects micro-transactions while taxing high-value commerce.

- **Segmented Thresholds:** Transactions below ₹2,000 should remain at zero cost to the

merchant, supported by continued (though targeted) government subsidies to maintain grassroots adoption.⁶²

- **Large Merchant MDR:** A regulated, nominal MDR of 0.3% (30 basis points) should be reintroduced for merchants with an annual turnover exceeding ₹40 lakh.⁶³ As these entities already pay 1.5% to 2% for credit card processing, a 0.3% fee represents a competitively priced utility that provides the necessary capital for PSPs to sustain operations without burdening the "common citizen."⁶⁴

5.2 Linking Revenue to Security Investment

To ensure that reintroducing MDR does not simply result in increased corporate margins, the RBI should mandate a **Security-Linked Reinvestment (SLR) Framework**.

- **Mandatory AI-Upgrades:** A specified percentage of MDR revenue should be statutorily earmarked for investments in real-time, AI-driven fraud monitoring and "Golden Hour" response systems.⁶⁵
- **Penal Accountability:** The proposed "Penal Framework for Negligent Branches" should be implemented immediately, holding banks financially liable for the proliferation of mule accounts.⁶⁶ This creates a dual incentive: the ability to earn revenue from MDR and the risk of losing it through security-related penalties.

5.3 Decentralized Governance and Digital Literacy

Accountability must move from central regulators to local implementers.

- **District Consultative Committees (DCCs):** As recommended by the parliamentary panel, DCCs should be chaired by the senior-most Member of Parliament in each district to bring "legislative accountability" to the implementation of digital literacy programs.⁶⁷
- **Outcome-Based Metrics:** The Ministry of Finance should officially pivot its Key Performance Indicators (KPIs) from "Account Acquisition" to "Active Usage and Fraud Resilience," incentivizing banks to focus on the quality of digital inclusion rather than just the number of Jan Dhan accounts.⁶⁸

5.4 Geographic and Institutional Rebalancing

To counter the concentration risk where three players dominate 80% of the volume, the ecosystem must be leveled.

- **Tier 3–6 Focus:** Government subsidies should be tapered off in Tier 1 and Tier 2 cities where MDR can sustain the market and redirected toward multi-year "Deep-Hinterland" subsidies to encourage PSPs to deploy infrastructure in rural areas where the cost of acquisition remains high.⁶⁹
- **B2B Orchestration:** Following Brazil's **Pix** model, the UPI framework should be optimized for high-value B2B transactions by allowing for variable limits and fee structures, thereby reducing the reliance on legacy systems like NEFT and IMPS for commercial settlements.⁷⁰

Conclusion

The "Paradox of Zero-Fee Digital Payments" is a transitional challenge. India has successfully achieved the first phase of digital transformation: universal accessibility. However, the second phase of sustainability and security requires a move toward an "Inclusive Instant Payments System" (IIPS) that acknowledges the operational costs of trust. By implementing a graded MDR and decentralizing governance, India can ensure that UPI remains a resilient global benchmark. Failure to act risks a "Technical Decline" of the ecosystem, where the infrastructure's fragility eventually outweighs its convenience, potentially driving users back to the shadow economy of physical cash.⁷¹

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