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# Stablecoin-based Remittance and Adoption in India

## Efficiency, Barriers, and Financial Inclusion Impact

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***Abstract*—**India received $125 billion in inward remittances in 2023, making it the world's largest recipient of migrant worker transfers. The bulk of these flows traverse traditional channels — SWIFT-based bank wires, money transfer operators such as Western Union, and informal hawala networks — that charge between 5% and 12.66% of transfer value and require one to five business days for settlement. Stablecoin rails, operating on blockchain networks such as Tron (USDT) and Stellar (USDC), complete transfers in seconds at fees below one US dollar, offering a structural cost advantage of four to thirteen times over conventional banking. Yet widespread adoption in India faces compounding barriers: an unresolved regulatory framework under the Foreign Exchange Management Act, persistent last-mile cash-out deficits affecting 52% of the rural population, and the Reserve Bank of India's explicit concern that dollar-pegged stablecoin adoption could trigger currency substitution and erode monetary sovereignty. This paper compares stablecoin rails against traditional remittance channels across cost, speed, and accessibility dimensions; examines India's current regulatory environment; and analyses the financial inclusion implications of stablecoin-based remittance for India's 13 million overseas workers and their rural households. The findings suggest that stablecoins offer meaningful efficiency gains for high-value, urban-recipient corridors, but face structural constraints that limit their near-term applicability to India's financially excluded population without targeted regulatory and infrastructure interventions.

***Keywords:*** stablecoin, remittance, India, financial inclusion, USDT, USDC, RBI, CBDC, FEMA, dollarisation

### I. INTRODUCTION

India's position as the world's top remittance recipient is not incidental. In 2023, the country received $125 billion from its diaspora — a figure that surpassed pre-forecast estimates by $14 billion and represented 66% of total South Asian remittance inflows of $189 billion [28]. For a country where remittance receipts constitute a significant share of household income in states such as Kerala, Uttar Pradesh, and Bihar, the cost of transferring these funds is not an abstraction. Every percentage point charged by an intermediary represents a direct deduction from a migrant worker's wage.

Traditional remittance infrastructure was designed for a world of correspondent banking relationships, physical branch networks, and multi-day settlement cycles. Banks remain the most expensive channel, averaging 12.66% of transfer value as of Q1 2024 [30]. Money transfer operators such as Western Union impose margins of approximately 7% on USD-to-INR transfers when both the explicit fee and exchange rate markup are included [16]. Against this backdrop, blockchain-based stablecoin transfers — using USDT on the Tron network or USDC on the Stellar network — complete within seconds at per-transfer costs below one dollar, regardless of amount.

This paper examines three interconnected questions: first, how stablecoin rails compare to traditional channels in measurable efficiency terms; second, what barriers prevent or constrain their adoption within India's specific regulatory and infrastructural context; and third, what financial inclusion implications arise for India's unbanked and underbanked migrant worker population. The analysis draws on secondary data from the World Bank, the Reserve Bank of India, the IMF, and blockchain analytics firms, alongside peer-reviewed literature on stablecoin adoption and financial inclusion.

The paper is structured as follows: Section II characterises India's remittance landscape by volume and corridor. Section III analyses traditional channel costs. Section IV describes stablecoin mechanisms and cost structures. Section V examines adoption patterns. Section VI identifies adoption barriers. Section VII addresses financial inclusion implications. Section VIII considers the regulatory framework and policy options. Section IX provides a comparative discussion, and Section X concludes with policy recommendations.

## II. INDIA'S REMITTANCE LANDSCAPE

### *A. Volume and Global Significance*

India's $125 billion in remittance inflows in 2023 places it decisively at the head of a global list in which Mexico ($67 billion), China ($50 billion), the Philippines ($40 billion), and Egypt ($24 billion) occupy subsequent positions [31]. Total remittance flows to low- and middle-income countries in 2023 reached an estimated $669 billion — a figure that exceeds foreign direct investment to these economies [31]. India alone received 18.7% of all LMIC remittances.

The macroeconomic significance of this flow is substantial. Remittances provide a counter-cyclical buffer for household consumption, fund rural housing construction, and in many cases constitute the primary income source for recipient families. Unlike FDI or portfolio investment, remittances are distributed directly to households, with a high propensity for consumption of essential goods and services.

### *B. Source Corridors*

The composition of India's remittance sources has shifted over the period 2020–2024. The United States has emerged as the single largest contributor, accounting for 27.7% of India's total inflows in 2023–24, up from 23.4% in 2020–21 [23]. The UAE remains the second-largest source at 18%, reflecting the scale of Indian labour migration to the Gulf. The United Kingdom accounts for 10.8%, itself an increase from 6.8% four years prior [23]. Collectively, the USA, UK, and Singapore account for 36% of India's remittance receipts.

The Gulf Cooperation Council countries collectively remain significant, but their relative share has declined as skilled Indian diaspora in the United States, United Kingdom, Canada, and Australia send increasingly large individual transfers. This bimodal corridor structure — high-volume, high-ticket skilled-worker transfers from advanced economies, alongside high-frequency, lower-ticket blue-collar transfers from Gulf states — has direct implications for which remittance technologies are most applicable.

### *C. Migrant Worker Profile*

Approximately 13 million Indians work abroad, of whom more than 60% are based in Gulf Cooperation Council nations [15]. The UAE alone hosts approximately four million Indian nationals, constituting the single largest Indian diaspora concentration globally outside the United States. The majority of Gulf-based Indian workers are employed in construction, manufacturing, hospitality, and domestic service — sectors characterised by low wages, limited banking access in the host country, and a strong reliance on money transfer operators for remittance services.

## III. TRADITIONAL REMITTANCE CHANNELS: COST AND EFFICIENCY ANALYSIS

### *A. SWIFT and Bank Wires*

SWIFT-based international wire transfers, used primarily by banks, carry fees of $20–$50 per transaction at the sending institution, with additional correspondent bank charges deducted from the transfer amount before it reaches the beneficiary [14]. Settlement times range from one to three business days under standard SWIFT processing, though SWIFT gpi has reduced this for participating institutions. For a $200 transfer — the benchmark used by the World Bank's Remittance Prices Worldwide database — a $25 fixed fee represents 12.5% of principal, which closely tracks the global bank average of 12.66% recorded in Q1 2024 [30].

### *B. Money Transfer Operators*

Western Union, the most widely used MTO for Gulf–India and USA–India corridors, generates revenue through both an explicit service charge and an exchange rate margin. For USD-to-INR transfers, the combined cost approximates 7% of transfer value [16]. This is consistent with the global MTO average and sits above the SDG target of 3% established under Sustainable Development Goal 10.c.1, which requires the average cost of remittances to be reduced to below 3% of transfer value by 2030.

### *C. The South Asia Cost Profile*

Despite being the lowest-cost receiving region globally, South Asia recorded an average remittance cost of 5.16% in Q1 2024 [30] and 5.44% in Q3 2023 [29]. The global average stands at 6.35% [30]. These figures represent the cost of sending $200 and include both the explicit transfer fee and the foreign exchange margin. The SDG 3% target remains substantially unmet across all major India-bound corridors.

**TABLE I: Cost and Settlement Time Comparison — Traditional Channels**

| Channel | Typical Cost (% of $200) | Settlement Time | Regulatory Status |
|---|---|---|---|
| Bank wire (SWIFT) | 12.66% average | 1–3 business days | Fully regulated |
| Western Union (USD-INR) | ~7% (fee + FX margin) | Minutes–1 day | Licensed MTO |

| Channel | Typical Cost (% of $200) | Settlement Time | Regulatory Status |
|---|---|---|---|
| Hawala (Gulf–India) | 0.5–2% | Within 24 hours | Informal / unregulated |
| South Asia corridor avg. | 5.16% | 1–5 days | Varies |

*Sources: [30]; [16]; [14]; [9]; [11].*

### *D. Hawala*

The hawala system merits distinct treatment, as it serves a significant share of Gulf-to-India remittance flows and represents a functionally different cost and speed profile from formal channels. Hawala operates through a network of brokers (hawaladars) who settle net positions periodically rather than transmitting funds individually. Commission rates range from 0.5% to 7% depending on corridor, transfer amount, and relationship with the broker, with Gulf–India routes typically attracting fees of 0.5–2% [11], [9]. Settlement occurs within 24 hours.

This cost advantage over formal channels is real, particularly for small-value transfers where fixed charges make proportional costs prohibitive. The critical deficiencies of hawala are regulatory opacity, absence of consumer protection, susceptibility to anti-money laundering and counter-terrorism financing violations, and its illegal status in India under the Foreign Exchange Management Act. Any analysis that positions stablecoins as unambiguously cheaper than all alternatives must acknowledge that for micro-transfers on the Gulf–India corridor, hawala's effective cost remains competitive with blockchain-based options once on/off-ramp charges are included.

## IV. STABLECOIN RAILS: MECHANISMS AND COST STRUCTURE

### *A. Architecture of Stablecoin Remittance*

A stablecoin is a cryptographic token whose value is pegged to a reference asset — typically the US dollar — through reserve holdings, algorithmic mechanisms, or some combination of the two. The three stablecoins most relevant to remittance use are Tether (USDT), USD Coin (USDC), and Dai (DAI). USDT and USDC are fiat-collateralised, maintaining reserves in US Treasury securities and cash equivalents. DAI is algorithmically stabilised through collateralised crypto positions.

For remittance purposes, the operational sequence involves: (1) conversion of source-country fiat currency to stablecoin at an exchange or peer-to-peer platform; (2) on-chain transfer of the stablecoin to a recipient wallet; (3) conversion of stablecoin to destination-country currency at an exchange, mobile application, or agent network. The second step — the on-chain transfer — carries negligible fees. The cost burden falls primarily on steps one and three: the fiat-to-crypto and crypto-to-fiat conversions.

### *B. Network Infrastructure*

USDT on Tron (TRC-20): The Tron network has become the dominant infrastructure for USDT transfers, processing more than 60% of global USDT transaction volume and recording over two million daily USDT transactions [18]. A standard TRC-20 USDT transfer costs between $0.42 and $1.00, reducible to $0.10–$0.15 with energy rental optimisation [26]. Tron captures 65% of global retail-sized transfers below $1,000 USDT, positioning it as the de facto infrastructure for migrant worker remittances in emerging markets [18].

USDC on Stellar: The Stellar network, purpose-designed for cross-border payment applications, finalises transactions in three to five seconds at a per-transaction fee of approximately $0.00001 [24]. A partnership between Circle (USDC issuer) and MoneyGram provides access to 81,000 cash-in and cash-out locations globally, enabling users without bank accounts to enter and exit the stablecoin ecosystem through physical agent networks [24]. This infrastructure directly addresses the last-mile cash-out problem for unbanked recipients.

### *C. Cost Comparison*

A Harvard Business School working paper analysing cross-border payment rails found that stablecoin-based transfers are four to thirteen times cheaper than bank wire transfers for equivalent transaction values [7]. Ekshian [8] found that blockchain-based transfers reduce per-corridor fees from the 6–8% traditional average to 1–3%, with disintermediation of correspondent banks as the primary mechanism. Stablecoins constituted more than 50% of all on-chain transaction volume to and from centralised services between mid-2022 and mid-2023 [3].

**TABLE II: Cost Comparison — Stablecoin Rails vs. Traditional Channels**

| Channel | On-chain / Transfer Fee | All-in Cost (est.) | Settlement Time |
|---|---|---|---|
| USDT (TRC-20 / Tron) | $0.42–$1.00 | 1–3% (incl. on/off-ramp) | <1 minute |
| USDC (Stellar) | ~$0.00001 | 1–3% (incl. on/off-ramp) | 3–5 seconds |
| Bank wire (SWIFT) | $20–50 fixed | 12.66% avg. | 1–3 days |
| Western Union (USD-INR) | Variable | ~7% | Minutes–1 day |

| Channel | On-chain / Transfer Fee | All-in Cost (est.) | Settlement Time |
|---|---|---|---|
| Hawala (Gulf–India) | N/A (cash-based) | 0.5–2% | <24 hours |
| South Asia avg. (formal) | — | 5.16% | 1–5 days |

*Sources: [26]; [24]; [7]; [30]; [16]; [9].*

The all-in cost for stablecoin transfers warrants clarification. The on-chain fee is negligible, but cryptocurrency exchange fees for conversion typically range from 0.1%–1% per side, and fixed fiat withdrawal charges can range from $5 to $25. For large transfers, these charges represent a small percentage; for $100 or below, they can raise the effective cost to levels comparable with formal MTOs, and in some cases exceed hawala rates.

## V. ADOPTION PATTERNS: INDIA AND EMERGING MARKETS

### *A. India's Crypto Adoption Profile*

India ranked first among 154 countries in the Chainalysis Global Crypto Adoption Index in both 2023 and 2024, with the highest grassroots adoption score globally [4], [5]. India is also the world's second-largest cryptocurrency market by raw estimated transaction volume. Central and South Asia as a region accounted for six of the global top-ten countries in the adoption index.

This adoption profile reflects several structural factors: a large, young, mobile-connected population; familiarity with digital payments through UPI's 350 million users; the 30% tax on cryptocurrency gains introduced by the Government of India in 2022, which paradoxically legitimised crypto as a taxable asset class; and the significant presence of remittance-sending diaspora in countries with accessible crypto exchange infrastructure.

### *B. Stablecoin Remittance Adoption Evidence*

Ahmed [1], analysing a sample of 866 US-based adults engaged in remittance activities, found that 26% had adopted stablecoins for cross-border remittances. The study, published in Telematics and Informatics, identified digital literacy and financial literacy as independent predictors of stablecoin adoption, with their interaction producing a synergistic enhancement of adoption probability. This finding has direct implications for India: uptake among households most in need of cost-efficient remittance channels may be constrained precisely by the barriers that make the technology most valuable.

### *C. Tron's Emerging Market Dominance*

Within the stablecoin ecosystem, the Tron network has emerged as the dominant infrastructure for retail-scale cross-border transfers. Tron's market position — 65% of global retail-sized USDT transfers and more than two million daily transactions — is attributable to its fee structure, throughput capacity, and early adoption by peer-to-peer trading platforms in South and Southeast Asia [18]. For the UAE-to-India corridor, informal stablecoin transfers via Tron have been documented in peer-to-peer market data, though the absence of KYC requirements on many platforms creates AML compliance concerns analogous to those associated with hawala.

## VI. ADOPTION BARRIERS

### *A. Regulatory Uncertainty*

India's regulatory trajectory on cryptocurrency has been characterised by sharp reversals. In April 2018, the Reserve Bank of India issued Circular RBI/2017-18/154, directing all regulated entities to cease providing services facilitating transactions in virtual currencies [19]. This effectively prohibited Indian banks from maintaining accounts for cryptocurrency exchanges.

In March 2020, the Supreme Court of India, in Internet and Mobile Association of India v. Reserve Bank of India (Writ Petition Civil No. 528 of 2018), struck down the circular as 'manifestly arbitrary' and disproportionate to the regulatory objective [25]. The ruling restored banking access for crypto businesses, but did not establish a positive regulatory framework.

**TABLE III: India's Crypto Regulatory Timeline**

| Date | Event |
|---|---|
| April 2018 | RBI Circular RBI/2017-18/154: Banks barred from providing services for virtual currency transactions. |
| March 2020 | Supreme Court strikes down RBI circular (IMAI v. RBI) as disproportionate; banking access restored for crypto exchanges. |
| 2021 | Cryptocurrency and Regulation of Official Digital Currency Bill introduced in Parliament; not passed as of writing. |
| Nov. 2022 | RBI e₹-W (wholesale CBDC) pilot launched for government securities settlement. |
| Dec. 2022 | RBI e₹-R (retail CBDC) pilot launched in 5 cities with 4 participating banks. |
| 2022 | 30% flat tax on crypto gains and 1% TDS on transactions introduced in Finance Act. |

| Date | Event |
|---|---|
| May 2024 | SEBI proposes multi-regulator oversight framework; RBI simultaneously seeks ban on privately-issued stablecoins. |
| Dec. 2024 | RBI Financial Stability Report: private stablecoins characterised as an 'existential threat' to monetary sovereignty. |
| 2024–present | Comprehensive Cryptocurrency Bill remains pending; no definitive regulatory framework enacted. |

*Sources: [19]; [22]; [25]; [6]; [21].*

The current environment remains ambiguous. The Cryptocurrency and Regulation of Official Digital Currency Bill, introduced in 2021, had not been enacted as of writing. In May 2024, SEBI proposed a multi-regulator oversight framework while the RBI simultaneously sought a ban on privately-issued stablecoins [6]. Under the Foreign Exchange Management Act, stablecoin transfers that bypass authorised dealer banks create compliance risks, as their legal characterisation has not been definitively adjudicated.

### *B. Last-Mile Cash-Out Infrastructure*

The on-chain transfer component of a stablecoin remittance is operationally straightforward. The critical friction points are fiat entry and exit. Fifty-two percent of India's rural population lives more than five kilometres from the nearest bank branch, ATM, or banking correspondent [2]. Average travel time to access formal financial services exceeds thirty minutes. While 1.32 million banking correspondents were deployed by FY2022, coverage remains geographically uneven [2]. The MoneyGram-Stellar and MoneyGram-Tron integrations that provide off-ramp access in some emerging markets have not been extended to India's agent banking network at scale.

### *C. Digital and Financial Literacy*

Ahmed's [1] finding that digital and financial literacy are the primary predictors of stablecoin adoption has direct bearing on India's rural remittance recipient population. The World Bank Global Findex Database [27] records that India remains one of seven countries collectively accounting for 54% of the global adult unbanked population, estimated at 740 million individuals. Women constitute approximately 60% of unbanked Indian adults. A household that lacks a smartphone, an exchange account, and the knowledge to execute a multi-step stablecoin conversion cannot benefit from the protocol-level cost advantages that stablecoin rails offer.

### *D. Dollarisation and Monetary Sovereignty Risk*

The RBI's December 2024 Financial Stability Report characterised stablecoins as an 'existential threat' to India's monetary sovereignty, describing the rapid growth of foreign-currency-pegged stablecoins as a potential precursor to currency substitution [21]. Le, Copestake, Tan, Peiris and Rawat [13], in IMF Working Paper WP/23/249, developed a two-country New Keynesian DSGE model and found that foreign stablecoin availability amplifies currency substitution and capital outflows in response to negative macroeconomic shocks, magnifying domestic output losses and weakening monetary policy transmission. The IMF Fintech Note 2023/012 reinforces this analysis, identifying 'digital dollarisation' as a distinct risk in economies with volatile exchange rates or weak institutional credibility [12].

India's macroeconomic situation differs from the small developing economy modelled by Le et al. [13] — India has a large domestic market, relatively stable inflation, and a functional central bank — but the underlying currency substitution mechanism applies whenever a more stable foreign-currency instrument displaces domestic currency in payment transactions.

### *E. On/Off-Ramp Friction and Exchange Costs*

Protocol-level fees do not capture the full cost of a stablecoin remittance. Fiat-to-crypto conversion at a centralised exchange typically incurs a 0.1%–1% trading fee, and fiat withdrawal carries a further fixed charge ranging from $5 to $25. For the typical Gulf migrant worker sending $100–$200 per month, these charges can raise the all-in cost to levels comparable with MTOs, erasing much of the efficiency advantage. This threshold effect means stablecoin remittance currently offers the greatest advantage to higher-value senders — predominantly skilled workers in advanced economies — rather than the lower-income blue-collar workers who most need cost relief.

## VII. FINANCIAL INCLUSION IMPLICATIONS

### *A. The Scale of Exclusion*

India's financial inclusion trajectory has improved materially, but significant gaps persist. The RBI's composite Financial Inclusion Index stood at 60.1 out of 100 as of March 2023, up from 56.4 in March 2022, reflecting improvements across usage and quality dimensions of a 97-indicator framework [20]. The Pradhan Mantri Jan-Dhan Yojana has facilitated the opening of over 550 million bank accounts, of which 331 million belong to rural and semi-urban residents [10]. The Jan Dhan–Aadhaar–Mobile trinity has enabled direct benefit transfers amounting to an estimated ₹3.48 lakh crore in leakage savings [10].

A necessary qualification applies here: the number of open accounts does not map directly to active financial participation. A substantial proportion of PMJDY accounts have remained dormant, particularly in rural areas where transaction costs and financial literacy barriers persist. The FI-Index's 'usage' sub-dimension — accounting for 45% of the composite score — reflects this gap, growing more slowly than the 'access' sub-dimension.

### *B. UPI as Infrastructure for Convergence*

The National Payments Corporation of India's Unified Payments Interface processed 131 billion transactions worth ₹199.89 lakh crore in FY2023–24, representing 62% of all digital payment transactions and serving over 350 million active users [17]. This infrastructure represents a foundational layer of digital payment literacy that could facilitate stablecoin adoption.

UPI's international rollout, with integrations in the UAE, Singapore, and other source countries, creates a potential convergence point. A regulatory framework permitting authorised stablecoin-to-UPI bridges could allow diaspora workers to send funds via stablecoin rails and have recipients withdraw via UPI, preserving regulatory oversight while reducing transfer costs.

### *C. Opportunity for Unbanked Migrant Workers*

The financial inclusion case for stablecoin remittance rests on two channels. First, for senders in Gulf countries who lack access to formal banking in their host country, peer-to-peer stablecoin platforms on Tron provide an alternative to MTO queues and cash-based hawala. Second, for recipients in India with smartphone access but limited bank branch access, exchange-integrated mobile wallets can receive stablecoin transfers and convert to rupees without requiring physical branch visits.

The Stellar-MoneyGram model, which allows cash-to-USDC conversion at physical agent locations, offers a structural template that could be adapted for India's banking correspondent network [24]. Were the 1.32 million banking correspondents [2] equipped to accept stablecoin-to-rupee conversions under an RBI-supervised framework, the last-mile gap for rural recipients could be substantially narrowed.

### *D. Gender Dimension*

Given that women constitute approximately 60% of India's unbanked adults [27], lower average digital literacy rates among rural women, combined with the complexity of multi-step stablecoin transactions, suggest that without targeted interventions, the benefits of stablecoin remittance would accrue disproportionately to male recipients. Inclusive adoption requires interface simplification, vernacular-language platform design, and targeted outreach through existing women's self-help group networks.

## VIII. REGULATORY FRAMEWORK AND POLICY CONSIDERATIONS

### *A. RBI's CBDC Strategy*

The RBI has positioned the digital rupee (e-₹) as its preferred response to the efficiency and inclusion challenges that stablecoins are positioned to address. The e₹-W (wholesale) pilot launched on 1 November 2022, targeting government securities settlement. The e₹-R (retail) pilot followed on 1 December 2022 in five cities with four participating banks [22]. By December 2023, the retail pilot had achieved one million daily transactions. The e-₹ is denominated in Indian rupees and is a direct liability of the central bank, carrying none of the dollarisation risk associated with USDT or USDC. Bilateral CBDC bridges — of the kind proposed under Project mBridge and the India-UAE Local Currency Settlement framework — would allow e-₹ to function as a remittance instrument without exposing India's monetary system to foreign-currency stablecoin risk.

### *B. FEMA and Cross-Border Constraints*

Under the Foreign Exchange Management Act (FEMA), all cross-border currency transactions must be conducted through Authorised Dealer banks. Stablecoin-based remittances that bypass this channel are legally ambiguous and potentially in violation of FEMA provisions, depending on whether the stablecoin is characterised as foreign currency, a security, or a commodity. A regulatory sandbox approach — under which selected operators could apply for temporary authorisation to process India-inbound corridors under enhanced KYC and AML obligations — would reduce this uncertainty while generating evidence on consumer protection and compliance outcomes.

### *C. SDG 10.c.1 and the 3% Target*

The United Nations Sustainable Development Goal 10.c.1 calls for the average cost of remittances to be reduced to below 3% by 2030. The global average stands at 6.35% [30], more than double the target. South Asia's 5.16% average remains 72% above the SDG threshold. Stablecoin rails, properly regulated, would meet and substantially beat this target for high-value transfers.

### *D. Policy Recommendations*

Four policy interventions emerge as potentially high-impact: (1) A time-limited regulatory sandbox permitting authorised stablecoin operators to process inbound remittances under FEMA-equivalent reporting. (2) Equipping India's 1.32 million banking correspondents to serve as stablecoin off-ramp infrastructure. (3) Accelerating bilateral CBDC bridge development with UAE, USA, and Singapore using the e-₹ as a sovereignty-preserving alternative to USDT and USDC. (4) Targeted digital and financial literacy programs for women in major remittance-receiving states, as a prerequisite for equitable participation.

## IX. DISCUSSION

### *A. The Efficiency-Sovereignty Tension*

The case for stablecoin-based remittance in the Indian context reduces to an efficiency-sovereignty tradeoff. The efficiency gains are real, quantified, and directionally consistent across multiple independent sources: stablecoin rails cost four to thirteen times less than bank transfers [7], settle in seconds, and serve populations with limited access to formal banking in source countries. For India's $125 billion annual remittance inflow, even a reduction in average transfer costs from 5.16% to 2% would represent approximately $4 billion per year retained by sender and recipient households.

The sovereignty concern is equally real. The IMF's modelling [13] demonstrates that in a country where a foreign-currency stablecoin gains significant transaction market share, the central bank's ability to manage monetary policy is materially weakened. The RBI's December 2024 Financial Stability Report characterises the risk explicitly and without ambiguity [21].

### *B. The Hawala Counterfactual*

Any honest analysis of stablecoin's cost advantage must acknowledge that the informal hawala system already provides Gulf–India remittances at 0.5–2% commission and same-day settlement — figures that match or exceed stablecoin performance on an all-in basis for micro-transfers [11], [9]. Hawala persists not because it is technologically sophisticated but because it is socially trusted, cash-compatible, and operationally accessible to workers who have no bank account, no smartphone, and no crypto literacy. Stablecoins will not displace hawala by being cheaper alone; they must also become more accessible, more trusted, and legally unambiguous.

### *C. The PMJDY Dormancy Problem*

The financial inclusion argument for stablecoin remittance rests partly on the premise that PMJDY has built a foundation of banked households. However, a significant share of PMJDY accounts are dormant or near-dormant, activated primarily for Direct Benefit Transfer receipt. A stablecoin remittance architecture requiring an active exchange account, a linked bank account, and digital transaction capability will not reach the households with the most dormant PMJDY accounts — which are disproportionately in the rural areas where remittance income is most significant.

### *D. The e-₹ as Potential Bridge*

The Reserve Bank of India's Digital Rupee, having demonstrated one million daily retail transactions by December 2023, represents a credible medium-term instrument for achieving both the cost and inclusion objectives that stablecoins are proposed to address [22]. Unlike USDT or USDC, the e-₹ is rupee-denominated, RBI-regulated, and legally unambiguous under FEMA. A cross-border e-₹ bridge with the UAE — building on the bilateral local currency settlement framework — could reduce UAE-to-India transfer costs to near-zero while preserving the monetary policy transmission that the RBI rightly seeks to protect.

## X. CONCLUSION

India's $125 billion remittance inflow in 2023 traverses a payment infrastructure that extracts, on average, 5.16% of every transfer in fees — consuming resources that would otherwise reach low-income households in major emigrant states. Stablecoin rails on the Tron and Stellar networks complete equivalent transfers in seconds at costs below one dollar at the protocol level, offering a structural efficiency advantage of four to thirteen times over traditional bank channels. India's position as the world's top-ranked country for grassroots crypto adoption in both 2023 and 2024 indicates that the underlying digital infrastructure and user familiarity to support stablecoin remittance are developing.

However, the path from protocol efficiency to mass adoption in India is constrained by three structural factors. First, India's regulatory framework does not yet provide a legal basis for stablecoin-based cross-border transfers under FEMA, and the RBI's opposition to privately-issued foreign-currency stablecoins reflects legitimate monetary sovereignty concerns supported by IMF modelling. Second, the last-mile cash-out infrastructure required to serve rural recipients — 52% of whom live more than five kilometres from any formal financial access point [2] — does not currently support stablecoin conversion at scale. Third, digital and financial literacy remain the primary determinants of stablecoin adoption, and the households most dependent on remittance income are those most likely to lack these capabilities.

The most viable near-term path combines: a regulatory sandbox for supervised stablecoin remittance trials on high-volume corridors; an acceleration of bilateral CBDC bridge development using the e-₹ as a sovereignty-preserving alternative; and targeted digital literacy investment focused on women in major remittance-receiving states. Together, these measures could deliver meaningful progress towards the SDG 10.c.1 target of 3% average remittance cost by 2030 [30] without exposing India's monetary framework to the dollarisation risks that the RBI has identified.

Future research should examine: empirical data on informal stablecoin usage in UAE-India corridor transfers; technical and regulatory design requirements for an e-₹-USDC cross-border bridge; and the causal relationship between digital literacy program interventions and stablecoin adoption probability among rural Indian women.

## REFERENCES

[1] Ahmed, S. (2024). From adoption to continuance: Stablecoins in cross-border remittances and the role of digital and financial literacy. Telematics and Informatics, 97, 102230. https://doi.org/10.1016/j.tele.2024.102230

[2] BIS/FSI (2023). Financial Stability Institute Insights on Policy Implementation No. 43. Bank for International Settlements. https://www.bis.org/fsi/publ/insights43.pdf

[3] Chainalysis (2023a). The 2023 Geography of Cryptocurrency Report. Chainalysis Inc.

[4] Chainalysis (2023b). The 2023 Global Crypto Adoption Index. Chainalysis Blog. https://www.chainalysis.com/blog/2023-global-crypto-adoption-index/

[5] Chainalysis (2024). The 2024 Geography of Crypto Report. Chainalysis Inc.

[6] CoinDesk/Reuters (2024, May 16). India's market regulator suggests shared crypto oversight even as RBI seeks stablecoin ban. CoinDesk. https://www.coindesk.com/policy/2024/05/16/indias-market-regulator-suggests-shared-crypto-oversight-even-as-rbi-seeks-stablecoin-ban-reuters

[7] Du, W., Huang, J. and Scharfstein, D. (2024). Competing Rails for Cross-Border Payments: Banks, Fintechs, and Stablecoins. Harvard Business School Working Paper.

[8] Ekshian, E. V. (2025). Stablecoins and the Future of Remittances: A Comparative Analysis of Costs, Efficiency, and Economic Impacts across Emerging Markets. FGV Europe Research Study. https://www.fgveurope.de/wp-content/uploads/2025/02/Research-Study-Emily-Ekshian.pdf

[9] El Qorchi, M. (2002). Hawala. Finance & Development, 39(4). International Monetary Fund. https://www.imf.org/external/pubs/ft/fandd/2002/12/elqorchi.htm

[10] Government of India/DD News (2024). Govt's financial inclusion drive crosses major milestones with over 55 crore Jan Dhan accounts. DD News. https://ddnews.gov.in/en/govts-financial-inclusion-drive-crosses-major-milestones-with-over-55-crore-jan-dhan-accounts/

[11] IMF (2003). Informal Funds Transfer Systems: An Analysis of the Informal Hawala System (Occasional Paper No. 222). International Monetary Fund. https://www.imf.org/external/pubs/nft/op/222/index.htm

[12] IMF (2023). Macrofinancial Implications of Foreign Crypto Assets for Small Developing Economies (Fintech Note 2023/012). International Monetary Fund.

[13] Le, A., Copestake, A., Tan, B., Peiris, S. and Rawat, U. (2023). Macro-Financial Impacts of Foreign Digital Money (IMF Working Paper WP/23/249). International Monetary Fund. https://www.imf.org/en/publications/wp/issues/2023/12/05/macro-financial-impacts-of-foreign-digital-money-542034

[14] Levro (2023). SWIFT Transfer Fees Explained. Levro Blog. https://www.levro.com/blog/swift-transfer-fees-explained

[15] Ministry of External Affairs, Government of India (2023). Parliamentary statement on Indians working abroad. New Delhi: Government of India.

[16] Monito (2023). How Much Are Western Union's Fees? Monito. https://www.monito.com/en/wiki/how-much-is-the-western-union-fee

[17] NPCI (2024). UPI Product Statistics. National Payments Corporation of India. https://www.npci.org.in/product/upi/product-statistics

[18] Presto Research (2024). TRON: Redefining the Global Settlement Layer. Presto Labs. https://www.prestolabs.io/research/tron-redefining-the-global-settlement-layer

[19] Reserve Bank of India (2018). Circular RBI/2017-18/154: Prohibition on Dealing in Virtual Currencies. https://www.rbi.org.in/Scripts/NotificationUser.aspx?Id=11243

[20] Reserve Bank of India (2023). Financial Inclusion Index, March 2023. RBI Bulletin. https://rbi.org.in/scripts/BS_ViewBulletin.aspx?Id=20502

[21] Reserve Bank of India/Business Standard (2024, December). RBI reiterates cautious stance on crypto assets, stablecoins for stability. Business Standard. https://www.business-standard.com/finance/news/rbi-cautious-on-crypto-assets-stablecoins-advocates-cbdcs-125123100867_1.html

[22] Reserve Bank of India/PIB (2022). Central Bank Digital Currency (CBDC) Pilot Launched by RBI in Retail Segment. Press Information Bureau. https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1882883

[23] Reserve Bank of India (2025, March 19). Remittances to India from advanced economies surpass Gulf inflows. Business Standard. https://www.business-standard.com/economy/news/remittances-to-india-from-advanced-economies-surpass-gulf-inflows-rbi-125031901164_1.html

[24] Stellar Development Foundation (2024). Blockchain Remittances: A Game Changer for Cross-Border Transfers. https://stellar.org/blog/ecosystem/blockchain-remittances-a-game-changer-for-cross-border-transfers

[25] Supreme Court of India (2020). Internet and Mobile Association of India v. Reserve Bank of India, Writ Petition (Civil) No. 528 of 2018, decided 4 March 2020.

[26] TronNRG (2024). Tron Network Fee Calculator: Exact USDT Transfer Costs at Every Volume. https://tronnrg.com/en/blog/tron-network-fee-calculator-guide/

[27] World Bank (2022). Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19. World Bank Group.

[28] World Bank (2023a). Migration and Development Brief 39: Remittance Flows Continue to Grow in 2023 Albeit at Slower Pace. World Bank Group.

[29] World Bank (2023b). Remittance Prices Worldwide Issue 47, Q3 2023. World Bank Remittance Prices Worldwide Database.

[30] World Bank (2024a). Remittance Prices Worldwide Issue 49, Q1 2024. World Bank Remittance Prices Worldwide Database.

[31] World Bank (2024b). Migration and Development Brief 40: Remittances Slowed in 2023, Expected to Grow Faster in 2024. World Bank Group.

## DATA AVAILABILITY STATEMENT

All data used in this paper are drawn from publicly available secondary sources cited in the reference list. No primary data were collected.

## ETHICS DECLARATION

This paper relies exclusively on published secondary data. No human subjects were involved; institutional ethics approval was not required.

## AUTHOR CONTRIBUTIONS

Kedar Mashalkar — conceptualisation, methodology, investigation, formal analysis, writing (original draft), writing (review and editing).

## CONFLICT OF INTEREST

The author declares no conflict of interest.

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