International Journal of Social Science and Economic Research

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

How Blockchain Technology is Transforming Global Remittance Systems

Dhyay Doshi

Jumeirah College, Dubai, United Arab Emirates

DOI: 10.46609/IJSSER.2025.v10i09.023 URL: https://doi.org/10.46609/IJSSER.2025.v10i09.023

Received: 28 August 2025 / Accepted: 19 September 2025 / Published: 25 September 2025

ABSTRACT

Remittances sustain hundreds of millions of households, yet heritage cross-border rails remain costly, slow, and opaque. This paper examines whether blockchain-based infrastructures can provide faster, cheaper, more transparent, and more inclusive remittances—and under what conditions such systems might be both equitable and sustainable. Three research questions guide the analysis: First, what are the factors that help with remittances using blockchain technology, and how do they improve efficiency compared to traditional systems? Second, what are the core benefits and limitations of using blockchain for cross-border transfers? Third, what is the current global value of blockchain-based remittances, and how widespread is their adoption? Synthesizing recent academic and industry evidence with country cases, the findings show that disintermediation and programmability reduce costs and settlement times; transparent ledgers improve compliance and trust; mobile wallets broaden access; and interoperability enables services such as credit and insurance. Limitations of using blockchain include fragmented regulation, KYC/AML frictions, fiat on- and off-ramp fees, scalability–privacy trade-offs, and risks of re-centralization. The discussion emphasizes that impact depends less on chain choice than on market design: interoperable stablecoin rails, harmonized e-KYC, robust consumer protections, and resilient last-mile delivery. Sustainable architectures, including proof-of-stake and renewable-aligned Layer-2 solutions can mitigate environmental intensity while preserving efficiency. Overall, blockchain remittances show significant promise, but their realization depends on governance, interoperability, and coordinated innovation.

1. INTRODUCTION

In an increasingly globalized world, remittances - money sent by migrants to their families back home - play a vital role in supporting economies and reducing poverty in developing countries. However, traditional remittance systems are often slow, costly, and inaccessible to those without formal banking services. Blockchain technology presents a promising alternative, offering the potential for faster, cheaper, and more transparent cross-border transactions. Understanding the

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

factors that influence blockchain-based remittances, as well as their benefits and limitations, is essential for evaluating their real-world viability and impact. Moreover, quantifying the current value of blockchain remittances worldwide provides insight into how widely this innovation is being adopted. These questions are not only crucial for policymakers and financial institutions, but also for families who rely on remittances for survival and development.

To explore this emerging field in depth, this paper addresses three key research questions. First, what are the factors that help with remittances using blockchain technology, and how do they improve efficiency compared to traditional systems? Second, what are the core benefits and limitations of using blockchain for cross-border transfers? Third, what is the current global value of blockchain-based remittances, and how widespread is their adoption? These questions form the foundation for a comprehensive analysis of blockchain's potential to reshape the future of remittance services.

This research paper is structured as follows: Section 2 discusses the background on blockchain technology and remittances in the world. It goes in depth about what blockchain is, how it works, and how it is used in remittances. Section 3 provides an insight into the methodology used to find the relevant information discussed in the paper. Section 4 describes the findings of the paper and answers the research questions. Section 5 provides an in-depth analysis of the findings and concludes the paper.

2. BACKGROUND

2.1. What is Blockchain?

Blockchain is a decentralized, distributed ledger that records transactions in sequential, immutable blocks across a peer-to-peer network (Ekshian, 2025). Each block stores transaction data, a timestamp, and the hash of the previous block, creating a tamper-evident chain (Crosby et al., 2016; Narayanan et al., 2016). This design enables transparency and trust without centralized intermediaries.

Consensus mechanisms are central to blockchain security. Proof-of-Work (PoW), used in Bitcoin, requires miners to solve complex puzzles, securing the network but consuming more than 100 terawatt-hours annually—comparable to entire nations (Cambridge Centre for Alternative Finance [CCAF], 2025). Alternatives such as "Green-PoW" reduce this burden by up to half (Ekshian, 2025). Proof-of-Stake (PoS) offers a more sustainable model: Ethereum's transition reduced energy use by about 99.98% (Crypto Carbon Ratings Institute [CCRI], 2022; EY, 2022). PoS is nearly a thousand times more efficient than PoW but raises new risks, including centralization and long-range attacks (Kiayias et al., 2017; Ethereum Foundation,

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

2025). Hybrid designs such as delegated PoS and BFT-based systems attempt to balance efficiency, decentralization, and security (Xiao et al., 2020).

Security also depends on asymmetric cryptography, which authenticates transactions through private and public keys while preserving pseudonymity (Narayanan et al., 2016). On this foundation, smart contracts—self-executing code—enable automated financial agreements, lowering intermediation costs (Schär, 2021). Yet their permanence creates regulatory challenges (Financial Stability Board [FSB], 2022).

In remittances, blockchain has clear advantages over legacy networks like SWIFT. Conventional transfers take 2–7 days and cost 6–8% of the amount sent, a burden that falls heavily on low-income migrants (World Bank, 2024). By contrast, blockchain payments settle nearly instantly, lower fees to as little as 1–3%, and increase transparency (Ekshian, 2025; Hasan & Salah, 2018).

Stablecoins—fiat-pegged digital assets—enhance this system by combining blockchain's speed with reduced volatility. They are increasingly used in remittances but raise risks around reserve opacity and de-pegging, drawing regulatory scrutiny (U.S. Department of the Treasury, 2021; FSB, 2022; FXC Intelligence, 2025). Adoption is nevertheless accelerating: 26% of U.S. remittance users employ stablecoins, with global transactions exceeding $5.7 trillion in 2024 (Blockchain Research Lab, 2025; FXC Intelligence, 2025). In emerging markets such as India, Nigeria, and Mexico, stablecoins provide critical access to savings and financial services (Ekshian, 2025).

Major platforms including Ripple, Stellar, and regional providers like Coins.ph are establishing payment corridors across Asia, Africa, and Latin America (Chainalysis, 2024; Stellar Development Foundation, 2022). Still, challenges remain—regulatory harmonization, foreign-exchange liquidity, AML/KYC compliance, and last-mile currency conversion (OECD, 2020).

In sum, blockchain combines distributed ledgers, efficient consensus, cryptographic security, smart contracts, and stablecoins to modernize remittances. These features promise faster, cheaper, and more inclusive transfers, though unresolved risks and regulatory uncertainty persist.

2.2. How have remittances been taking place in the world?

Before blockchain's emergence, remittance flows were one of the largest financial inflows to developing economies, totaling about $630 billion in 2019, with formal flows to low- and middle-income countries reaching $605 billion in 2021—far exceeding development aid (World Bank, 2020, 2021; Bank for International Settlements [BIS], 2021). Migrants in high-income countries primarily sent transfers to Latin America, South Asia, and Sub-Saharan Africa, making remittances a vital income source. For example, transfers to Guatemala equaled nearly 10% of

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

GDP in 2019, with U.S.-based Guatemalan workers sending an average of $280 monthly, largely through money transfer operators (MTOs) due to limited banking access (World Bank, 2020, 2021).

Traditional remittance systems relied on MTOs such as Western Union and MoneyGram, supported by correspondent banks, physical branches, cash handling, and pre-funded nostro/vostro accounts (World Bank, 2020). In cash-dominant regions like Central America and Sub-Saharan Africa, fees frequently exceeded 6% and sometimes rose above 15% for small-value transfers under $200, significantly eroding recipient income (Aycinena & Yang, 2014; World Bank, 2020). Settlement times typically spanned 2–5 business days due to manual reconciliation, batch processing, and time zone differences.

Informal value-transfer systems such as hawala and hundi also played major roles. While these provided lower fees and rapid delivery, often within hours, they lacked transparency, regulation, and consumer protection—raising concerns about illicit finance and financial inclusion (El Qorchi, 2002; Center for Latin American Monetary Studies [CEMLA], 2020).

Case studies highlight these systemic inefficiencies. In the U.S.–Guatemala corridor, undocumented migrants heavily depended on MTOs, while rural recipients without banking access relied on cash pickup points. Costs were driven up by cash logistics, and the lack of digital infrastructure hindered financial access (World Bank, 2020). Similarly, India's remittance inflows grew from $55 billion in 2010 to $83 billion in 2019, but many rural households remained tied to opaque local agents with high fees and limited transparency (World Bank, 2023).

The cumulative effect of high fees, long settlement times, cash dependence, and financial exclusion defined the pre-blockchain remittance landscape (Aycinena & Yang, 2014; World Bank, 2020, 2021). These inefficiencies disproportionately harmed low-income households, as costs reduced disposable income while delays exposed families to liquidity risks.

Blockchain began disrupting this paradigm by enabling peer-to-peer transfers without correspondent banks or MTOs. Stablecoin rails allowed remitters to bypass costly FX intermediaries, cutting fees to 1–3% and reducing settlement to seconds (Soufiah, 2021; International Monetary Fund [IMF], 2025). Immutable ledgers enhanced compliance, while digital wallets—sometimes accessible even via SMS—expanded reach to the unbanked (Soufiah, 2021; IMF, 2025). Smart contracts further streamlined services through automated compliance checks and conditional disbursements.

Country-specific experiences illustrate blockchain's impact. In the Philippines, where remittances equal nearly 10% of GDP, UnionBank launched Project i2i to connect 476 rural

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

banks using Enterprise Ethereum, enabling near-real-time interbank transfers and bypassing costly legacy systems (Consensys, 2023). In Sub-Saharan Africa, BitPesa (now AZA Finance) integrated stablecoin rails into Kenya, Nigeria, and Uganda, lowering fees to 1–3% compared with over 7% via conventional operators (Rühmann, 2020; Chainalysis, 2024). These corridors processed around $125 billion in on-chain flows in 2023–2024, highlighting significant uptake (Chainalysis, 2024).

Vietnam represents another key market. Inbound remittances reached $16.7 billion in 2019 (≈6% of GDP), but traditional transfers were slow and costly (Ungson, 2022). To address this, SBI Ripple Asia and TPBank launched blockchain corridors linking Vietnam and Japan, enabling near-instant transfers at 1–3% cost and allowing rural recipients to withdraw through convenience stores and telecom outlets (Ungson, 2022; Russin & Vecchi, 2023). Vietnam's high crypto adoption (≈17% of the population) further accelerated stablecoin-based remittances (Crypto for Innovation, 2024; Finextra, 2025).

In Bangladesh, remittances of $24 billion in 2023–24 contributed 6–7% of GDP (Migration Data Portal, 2024; World Bank, 2023). Legacy channels faced high fees (5–10%) and limited transparency, particularly in rural areas (Migration Policy Institute, 2024). To modernize, bKash partnered with Ripple and Malaysia's Mobile Money in 2020 to launch a blockchain corridor that enabled near-real-time wallet-to-wallet transfers and improved traceability (The Business Standard, 2023; TBS News, 2023). Financial institutions also piloted blockchain-based letters of credit, reducing processing from 5–10 days to less than 24 hours. Informal stablecoin usage through platforms like Remitano and Paxful further expanded low-cost alternatives (Finextra, 2025).

Across these contexts, blockchain remittances consistently reduced fees, shortened settlement times, improved liquidity, and expanded access—directly addressing inefficiencies of legacy systems. Yet challenges persist: regulatory uncertainty, digital literacy gaps, stablecoin reserve transparency, and local payout infrastructure remain barriers (Russin & Vecchi, 2023; TBS News, 2023).

In summary, pre-blockchain remittances were costly, slow, and exclusionary. Blockchain deployments in the Philippines, Sub-Saharan Africa, Vietnam, and Bangladesh demonstrate how digital rails can transform these systems into faster, cheaper, and more inclusive networks—though scalability and regulatory clarity are still essential.

3. METHODOLOGY

The methodology for this paper is a structured literature review conducted in two stages. First, I searched Google Scholar using the keywords 'blockchain,' 'finance,' and 'remittances,' yielding

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

a broad set of academic articles and reports. Second, I reviewed grey literature such as industry blogs, company reports, and policy briefs, narrowing the scope to works directly addressing the research questions. Themes were identified and synthesized to inform the analysis.

4. FINDINGS

4.1. How does blockchain technology improve the efficiency of remittances?

Blockchain remittances markedly outperform traditional systems through integrated efficiencies in decentralization, automation, and transparency. A key factor is **disintermediation**: by bypassing correspondent banks, clearinghouses, and money transfer operators, blockchain eliminates layers that delay transfers and inflate costs (Tapscott & Tapscott, 2018; Catalini & Gans, 2020). It also removes the need for costly nostro–vostro accounts, freeing tied-up liquidity and improving capital efficiency (Guo & Liang, 2016).

A direct outcome of this architecture is **accelerated settlement times**. Whereas legacy systems typically require 2–7 business days for cross-border transfers, blockchain enables peer-to-peer transactions that settle within minutes and operate continuously without batching delays (International Monetary Fund [IMF], 2020; World Bank, 2020). This speed reduces exposure to exchange-rate risk and improves predictability, particularly for low-value remittance corridors.

Lower transaction fees are another advantage. Traditional transfers often cost 6–7% of $200, but blockchain reduces this burden to as little as 1–3% (Kshetri, 2021; Narula, 2020). Independent studies confirm that peer-to-peer blockchain payments are consistently cheaper than correspondent banking, which is critical for migrant workers sending frequent, small transfers.

Blockchain also supports **cross-border interoperability**. Platforms such as Ripple, Stellar, and ConsenSys' Interledger Protocol enable seamless value transfers across diverse ledgers and national borders, eliminating dependence on legacy banking integration (Ali et al., 2020; Mohan, 2023). This interoperability allows instant conversions between currencies, expands corridor access, and reduces friction.

Real-world applications reinforce these benefits. For example, **SBI Remit's partnership with Ripple** employs RippleNet's On-Demand Liquidity (ODL) and XRP as a bridge currency, enabling near-instant transfers from Japan to the Philippines, Vietnam, and Indonesia. Transactions settle in seconds, without pre-funded nostro accounts, significantly lowering operational costs and demonstrating blockchain's ability to streamline historically expensive remittance corridors (SBI Remit, 2022).

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

Security and data integrity are strengthened by blockchain's cryptographic design. Transactions are encrypted, time-stamped, and immutably recorded across distributed nodes, preventing fraud, double-spending, or tampering (Yermack, 2017; Nakamoto, 2008). This assurance fosters trust between transacting parties, even without prior relationships or institutional intermediaries.

Complementing security, **transparency and auditability** allow real-time traceability of funds. Senders, recipients, and regulators can monitor transfers end to end, improving compliance with AML/KYC rules, reducing reconciliation disputes, and enhancing institutional confidence (Catalini & Gans, 2020; Mohan, 2023).

Crucially, blockchain fosters **financial inclusion**. Anyone with a mobile device can open a digital wallet, bypassing formal banking requirements. In regions with weak financial infrastructure, this accessibility empowers marginalized communities and bridges gaps between formal and informal economies (Demirgüç-Kunt et al., 2018).

Finally, **programmable smart contracts** enhance efficiency by automating conditional disbursements. Funds can be released only when biometric verification or delivery confirmation is met, reducing administrative costs and ensuring reliable compliance (Schär, 2021). Moreover, remittance transaction data captured on-chain can support broader ecosystem integration, including predictive analytics, credit scoring, micro-lending, and insurance products, transforming remittances into gateways for wider financial inclusion (Mohan, 2023; Schär, 2021).

In sum, blockchain improves remittance efficiency through disintermediation, faster settlements, lower fees, interoperability, cryptographic security, and programmability—while simultaneously promoting inclusion and expanding access to financial services.

4.2. What are the benefits and limitations of using blockchain technology for remittances?

Blockchain is reshaping remittance systems by addressing persistent inefficiencies while also exposing new challenges.

A central benefit is **cost reduction**. By removing correspondent banks and money transfer operators, blockchain reduces operational overhead and lowers fees from the 6–7% typical for $200 transfers to 1–3% in many corridors (Kshetri, 2021; Narula, 2020). The use of stablecoins further avoids multiple currency conversions and their associated costs (Ekshian, 2025; Organisation for Economic Co-operation and Development [OECD], 2020).

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

Speed and settlement efficiency are equally important. Transactions that previously required 2–7 days can be completed within minutes or seconds through decentralized validation, eliminating batching delays in legacy systems (IMF, 2020; World Bank, 2020). Faster settlement reduces exposure to currency fluctuations and provides predictability for low-value transfers.

Security and transparency are strengthened through cryptographic integrity and immutable ledgers. Transactions are permanently recorded and verified across decentralized nodes, making fraud, double-spending, or tampering highly unlikely (Yermack, 2017; Nakamoto, 2008). This also enhances **traceability**, supporting AML/KYC compliance and reducing disputes (Mohan, 2023).

Blockchain also advances **financial inclusion**. Individuals with smartphones or even feature phones can open wallets without needing bank accounts, giving access to millions excluded from traditional finance (Demirgüç-Kunt et al., 2018; Kshetri, 2021). For providers, eliminating pre-funded nostro/vostro accounts frees up liquidity and improves capital efficiency (Guo & Liang, 2016). Smart contracts add automation, handling compliance checks, conditional disbursements, and error reduction (Schär, 2021).

Finally, **ecosystem integration** is enhanced. Transaction histories can support credit scoring, micro-loans, and insurance products, transforming remittances into gateways for digital financial services (Mohan, 2023).

Despite these advantages, several **limitations** remain. **Regulatory uncertainty** persists, as countries differ widely in how they govern crypto-based remittances (OECD, 2020). **Infrastructure barriers**—including poor internet connectivity, low smartphone penetration, and limited digital literacy—also constrain adoption (Demirgüç-Kunt et al., 2018). Stablecoins reduce volatility but remain vulnerable to de-pegging events, as seen in the collapse of TerraUSD (FSB, 2022).

Concerns of **re-intermediation** arise when large service providers or corporate validators centralize control, undermining decentralization (Tapscott & Tapscott, 2018; Mohan, 2023). User adoption challenges, such as difficulties managing private keys or fears of scams, further restrict uptake (Scott, 2016).

Technical issues persist as well. Popular networks face **scalability and congestion**, leading to higher fees during peak usage (Narayanan et al., 2016). Integration with traditional financial systems—especially fiat conversion—remains fragmented, while tensions between transparency and privacy continue to spark debate (OECD, 2020; Scott, 2016).

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

A case in point is **Tempo's integration with Stellar** for Europe–Philippines remittances. Stellar reduced transfer times to under five seconds and minimized fees by bypassing correspondent banks (Stellar Development Foundation, 2022). Yet Tempo still relies on mobile networks and local payout agents for fiat conversion, underscoring blockchain's potential but also its dependency on legacy infrastructure.

In summary, blockchain provides a robust set of benefits—lower costs, faster transfers, improved security, greater inclusion, and automation—but is constrained by regulatory ambiguity, infrastructural gaps, adoption barriers, and integration challenges. Addressing these issues is critical for realizing blockchain's transformative potential in remittances.

Table 1: Benefits and Limitations of Blockchain Technology in Remittances

Benefits	Limitations
Lower transaction fees	Regulatory uncertainty
Instant settlements	Infrastructure gaps
Immutable ledger security	Crypto volatility
Financial inclusion access	Centralization risks
Cross-border compatibility	User adoption barriers
Real-time transparency	Scalability issues
Liquidity optimization	Fiat conversion needs

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

Automated transactions	Privacy concerns
Data-driven financial services	

Source: Table adapted from the author's conceptualization based on literature (e.g., Demirgüç-Kunt et al., 2018; Ekshian, 2025; Kshetri, 2021; Mohan, 2023; OECD, 2020; Schär, 2021).

4.3. What is the global volume of remittances using blockchain?

Global remittance flows continue to expand, underpinned by migration trends, mobile wallet adoption, and fintech innovations. In 2025, total remittances are projected to reach roughly **$960 billion**, compared with **$905 billion in 2024** (Migration Data Portal, 2024; World Bank, 2024). For low- and middle-income countries, these transfers remain a critical source of foreign exchange and household income (Federal Reserve, 2023; World Bank, 2024).

Within this market, the **digital remittance segment**—covering mobile applications, fintech platforms, and blockchain channels—is valued at approximately **$29.1 billion in 2025**, with forecasts reaching **$51.1 billion by 2029** and **$77.7 billion by 2032** (Precedence Research, 2024; Grand View Research, 2024).

Focusing specifically on blockchain, **crypto-powered remittances** were valued at **$19.4 billion in 2024**, with a projected CAGR of nearly **18.7%**, reaching **$92.4 billion by 2033** (DataIntelo, 2024). This trajectory places blockchain's share at roughly **9–12% of global remittances**, translating to **$87–115 billion in 2025** (CoinLaw, 2025; DataIntelo, 2024). The figures underscore blockchain's rapid rise from a marginal innovation to a meaningful share of global flows.

Several drivers explain this expansion. First, **cost efficiency** is a key motivator: while traditional fees average 6–8%, blockchain corridors often reduce them to below 3% through disintermediation and stablecoin rails (Narula, 2020; Ekshian, 2025). Second, **speed and transparency** are attractive, with settlements occurring within seconds and immutably recorded on distributed ledgers (IMF, 2020; Visa, 2024). Third, **stablecoins**—which account for about 33% of total crypto transaction volume—mitigate volatility and provide value stability (Andreesen Horowitz [a16z], 2023).

Regional dynamics reinforce this trend. The **Asia-Pacific region** leads in blockchain adoption, supported by large migrant populations and strong digital infrastructure (The Business Research

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

Company, 2024). At the same time, **Latin America, Africa, and the Middle East** are emerging as growth zones, collectively receiving several billion dollars in blockchain remittances in 2024 (Inter-American Dialogue, 2024; Chainalysis, 2024). Sub-Saharan Africa and South Asia, which together received **$186 billion in remittances in 2024**, stand to benefit disproportionately from lower fees and faster settlement times (Federal Reserve, 2023; World Bank, 2024).

Comparative Data: 2024 vs. 2025

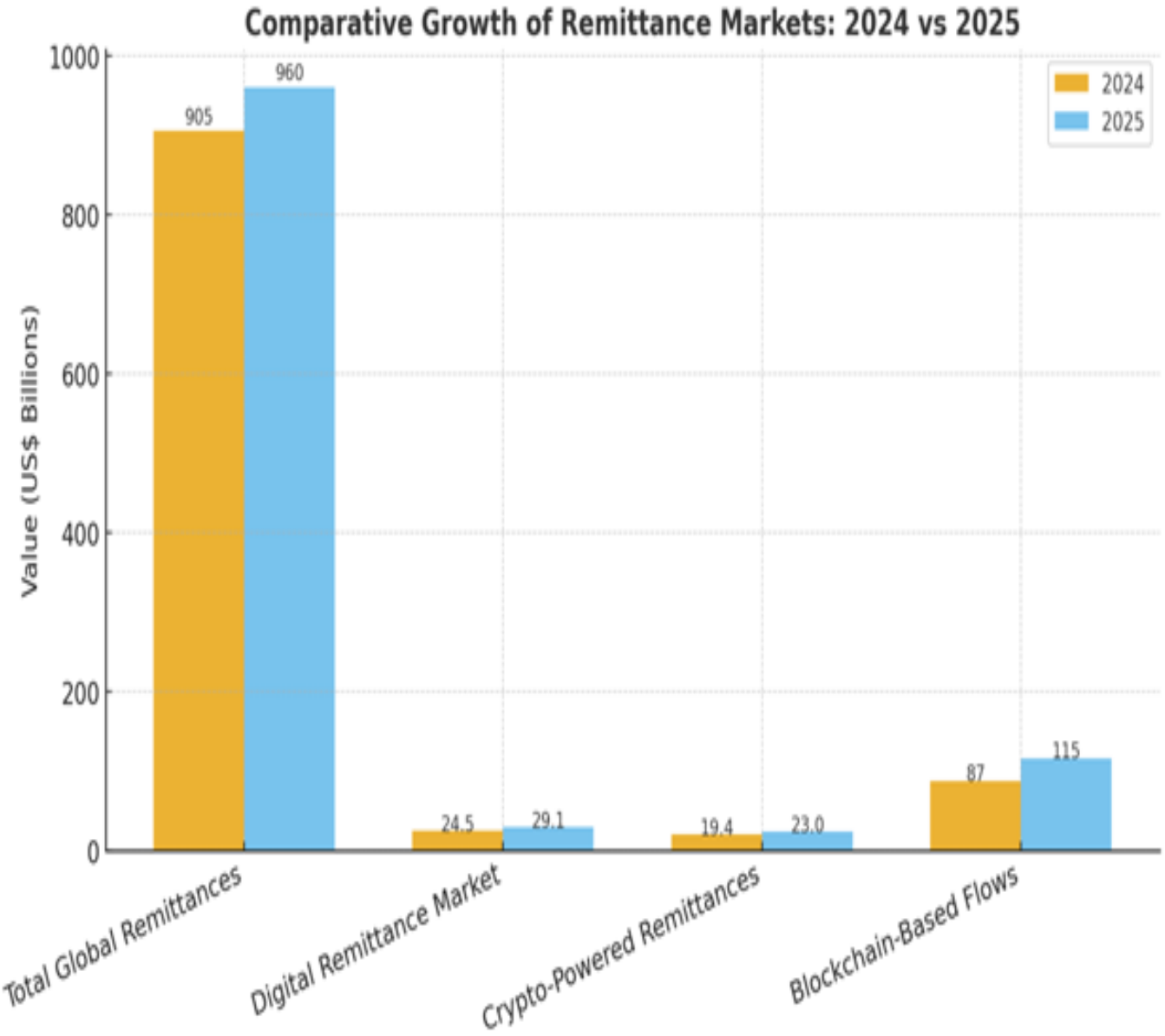
Category	2024 Value	2025 Estimate	Source
Total Global Remittances	US $905 billion	US $960 billion (+6.1%)	Migration Data Portal (2024); World Bank (2024)
Digital Remittance Market	US $24.5 billion	US $29.1 billion (+18.9%)	Grand View Research (2024); Precedence Research (2024)
Crypto-Powered Remittances	US $19.4 billion	US $23.0 billion (+18.6%)	DataIntelo (2024)
Blockchain Share of Global Flows	~9.6% (~US $87 billion)	~12% (~US $115 billion)	CoinLaw (2025); DataIntelo (2024)

Source: Data synthesized from World Bank, Migration Data Portal, Precedence Research, Grand View Research, DataIntelo, and CoinLaw.

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

Figure 1 - Comparative Growth of Remittance Markets: 2024 VS 2025



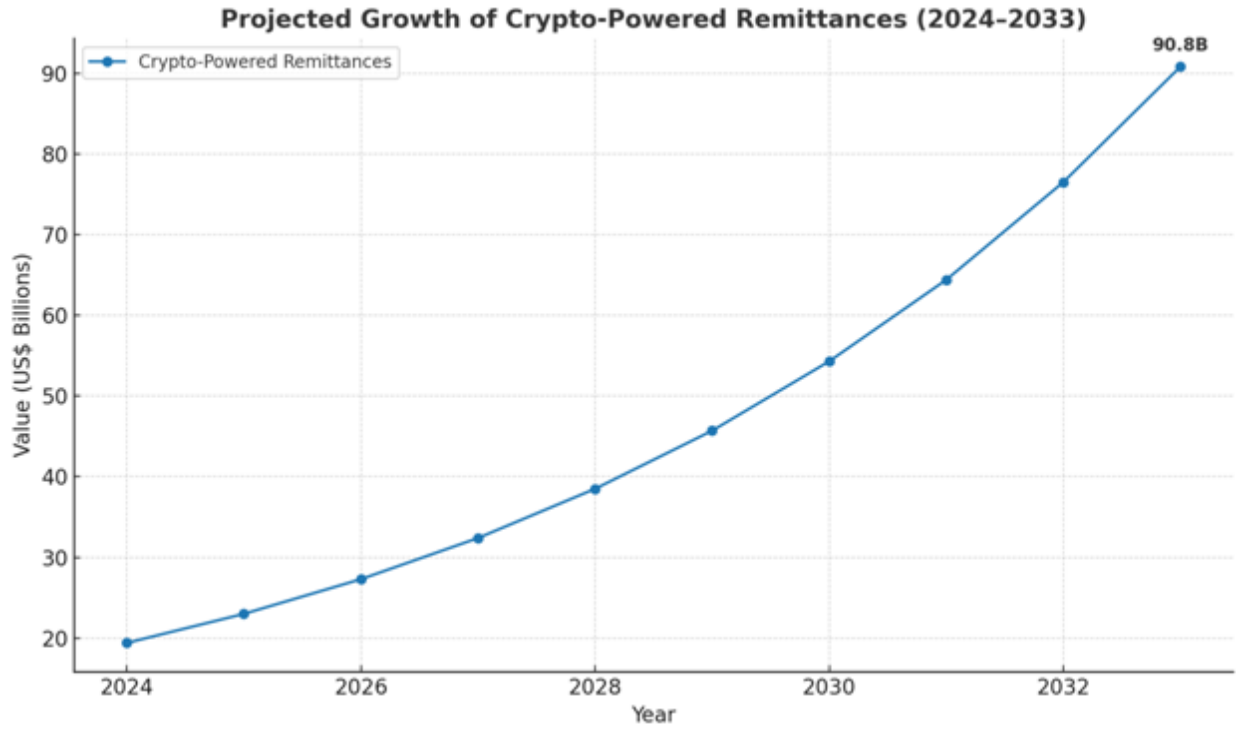
A bar chart comparing four categories (total global remittances, digital remittances, crypto-powered remittances, blockchain-based share). Year-on-year, total remittances rose 6.1%, digital remittances 18.9%, crypto-powered remittances 18.6%, and blockchain-powered flows 32.2%—underscoring blockchain's accelerating role in cross-border transfers.

Looking forward, projections suggest that by **2033 crypto-based remittances could exceed $92 billion**, a fivefold increase from 2024 levels (DataIntelo, 2024; Visa, 2024).

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

Figure 2 - Projected Growth of Crypto-Powered Remittances (2024-2033)



The line graph illustrates the projected expansion of crypto-powered remittances over a ten-year horizon, based on an estimated compound annual growth rate (CAGR) of 18.7%. Starting at **US $19.4 billion in 2024**, volumes are expected to rise steadily, surpassing **US $50 billion by 2029** and reaching approximately **US $92.4 billion by 2033**. This trajectory represents nearly a **fivefold increase in less than a decade**, underscoring blockchain's evolution from a niche channel into a major component of global remittance infrastructure. The sharp upward trend highlights blockchain's potential to capture an expanding share of cross-border flows, driven by cost efficiency, stablecoin adoption, and the demand for real-time settlement.

Key Insights

- Blockchain remittances already constitute a **multi-billion-dollar channel**, representing nearly 10% of global flows.
- **Stablecoin adoption, cost efficiency, and real-time settlement** are the main adoption drivers.
- **Asia-Pacific, Africa, and Latin America** will benefit most, given their migrant remittance volumes and digital readiness.

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

- Blockchain is transitioning from a niche innovation into **mainstream remittance infrastructure**, reshaping how value moves globally.

In conclusion, blockchain remittances now represent an estimated **$80–115 billion** annually. Though still a minority share of the global market, their rapid growth and future projections highlight blockchain's emergence as a credible, scalable component of international financial flows.

5. DISCUSSION AND CONCLUSION

Blockchain remittances are propelled by disintermediation—removing correspondent banks and money transfer operators—alongside faster settlement times, lower fees, interoperability, strong security, transparency, and improved financial inclusion via mobile access. They also offer better capital efficiency, automated smart-contract processing, and integration with broader ecosystems such as credit and insurance services. In short, blockchain delivers lower cost, instant settlement, cryptographic security, greater transparency, mobile accessibility, and automation.

Yet limitations remain. The technology continues to grapple with regulatory uncertainty, infrastructure constraints, persistent crypto volatility, risks of re-centralization, user adoption hurdles, scalability issues, challenges of fiat conversion, and privacy trade-offs.

Despite these challenges, blockchain-based remittances already account for a substantial share of global flows—around **US $80–90 billion in 2025**, or nearly **10% of international transfers**—and are projected to exceed **US $115 billion** (≈12%) within the same year (DataIntelo, 2024; World Bank, 2024). With an estimated **18.7% CAGR**, crypto-enabled remittances are set to expand rapidly, underscoring blockchain's increasing integration into cross-border finance.

The academic literature strongly corroborates these findings. Owolabi et al. (2024) demonstrate that blockchain could supplant SWIFT by lowering costs, enhancing speed, and strengthening security, reinforcing this study's conclusions on efficiency and trust. Christodoulou et al. (2024) likewise highlight blockchain's transformative role in remittances, stressing both its efficiency gains and the need to address regulatory and scalability barriers. The OECD (2020) reports similar benefits—reduced reliance on intermediaries and lower costs—while noting persistent challenges such as last-mile delivery and digital inclusion gaps. Mohammad (2025) affirms blockchain's potential for real-time settlement and financial inclusion but cautions that regulatory resistance and technical limits remain pressing issues. Together, these studies confirm the validity of this paper's findings and highlight a growing scholarly consensus on blockchain's disruptive potential in remittances.

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

For remittance users—often low-income households in LMICs—blockchain offers practical benefits: lower costs, faster access to funds, and broader reach, all of which improve household resilience and empowerment. Even incremental savings or quicker access to income can significantly enhance livelihoods.

For blockchain developers and financial providers, these results signal a substantial market opportunity. The growth trajectory and cost efficiency demonstrated here represent an investable domain for building scalable, compliant, and secure remittance infrastructure. Priority areas include resolving regulatory uncertainty, developing low-bandwidth interfaces to reach the unbanked, and forging partnerships with telecom operators and fintech firms.

Ultimately, this paper provides implementable guidance for stakeholders seeking to modernize cross-border transfers. By aligning technological innovation with user needs, blockchain-powered remittances can balance humanitarian goals with commercial incentives—advancing financial inclusion while reducing costs.

Looking forward, **sustainability must become a core research agenda**. "Green" blockchain rails combining proof-of-stake (PoS), energy-efficient layer-2 solutions, and renewable-powered infrastructure warrant rigorous testing. Evidence from Ethereum's post-Merge footprint—showing ≈99.9% lower energy use—demonstrates the potential for decarbonized financial corridors (Crypto Carbon Ratings Institute [CCRI], 2022; European Union Blockchain Observatory & Forum, 2023). Future studies should examine:

1. Emissions per US dollar remitted across PoS, permissioned chains, and rollups;
2. The effect of validator economics and reduced energy intensity on end-user fees; and
3. Whether programmable compliance and FX integration can help achieve the SDG 10.c target of ≤3% remittance costs while preserving inclusion (OECD, 2020).

Environmental analysis should also include renewable-energy procurement, tokenized renewable energy certificates (RECs), and electronic-waste minimization, with careful comparisons against legacy systems and remaining proof-of-work models (Tayebi et al., 2024).

In conclusion, blockchain rails can reduce costs, accelerate settlements, and enhance transparency and trust, but scalability, regulatory harmonization, and last-mile delivery remain binding limits. With sustainability-first design and carefully managed pilots, blockchain has the potential to deliver remittances that are not only cheaper and faster but also greener and more inclusive. With sustainability-first design and disciplined pilots, blockchain remittances can evolve into a cornerstone of inclusive, efficient, and climate-conscious global finance.

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

REFERENCES

1. Ali, S., Narayan, A., & Nelson, W. (2020). Interoperability in blockchain-based payment systems. *Journal of Payments Strategy & Systems, 14*(3), 250–263.
2. Andreessen Horowitz (a16z). (2023). *State of crypto report 2023*. a16z Crypto. https://a16zcrypto.com
3. Aycinena, D., & Yang, D. (2014). Experimental evidence on the use of alternative remittance channels. *Journal of Development Economics, 111*, 62–73. https://doi.org/10.1016/j.jdeveco.2014.08.005
4. Bank for International Settlements (BIS). (2021). *Annual economic report 2021*. https://www.bis.org/publ/arpdf/ar2021e.pdf
5. Blockchain Research Lab. (2025, April 27). *New research: 26% of U.S.-based remittance users have adopted stablecoins for their transactions*. https://www.blockchainresearchlab.org/2025/04/27/new-research-26-of-u-s-based-remittance-users-have-already-adopted-stablecoins-for-their-transactions
6. Cambridge Centre for Alternative Finance (CCAF). (2025). *Cambridge Bitcoin Electricity Consumption Index (CBECI)*. https://ccaf.io/cbeci
7. Catalini, C., & Gans, J. S. (2020). Some simple economics of the blockchain. *Communications of the ACM, 63*(7), 80–90. https://doi.org/10.1145/3383440
8. Center for Latin American Monetary Studies (CEMLA). (2020). *Remittances to Latin America and the Caribbean in 2020*. https://www.cemla.org
9. Chainalysis. (2024). *The 2024 geography of cryptocurrency report*. https://blog.chainalysis.com/reports/2024-geography-of-cryptocurrency
10. Christodoulou, K., Gkritsi, F., & Tsioumas, K. (2024). Blockchain technology and cross-border payments: Opportunities and challenges. *Journal of Payments Strategy & Systems, 18*(1), 15–28.
11. Consensys. (2023). *Project i2i: Connecting rural banks in the Philippines with blockchain*. https://consensys.net/blog/enterprise-blockchain/project-i2i
12. CoinLaw. (2025). *Blockchain remittances market outlook 2025*. https://coinlaw.com/reports/blockchain-remittances-2025

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

13. Crosby, M., Pattanayak, P., Verma, S., & Kalyanaraman, V. (2016). *Blockchain technology: Beyond Bitcoin*. Sutardja Center for Entrepreneurship & Technology, UC Berkeley. https://scet.berkeley.edu/wp-content/uploads/BlockchainPaper.pdf

14. Crypto Carbon Ratings Institute (CCRI). (2022). *Ethereum's energy consumption after The Merge*. ConsenSys. https://consensys.io/blog/ethereum-blockchain-eliminates-99-99-of-its-carbon-footprint-overnight-after-a-successful-merge

15. Crypto for Innovation. (2024). *Crypto adoption and remittances in emerging markets*. https://cryptoforinnovation.org/research

16. DataIntelo. (2024). *Blockchain remittances market size and forecast 2024–2033*. https://www.dataintelo.com

17. Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *The Global Findex Database 2017: Measuring financial inclusion and the fintech revolution*. World Bank. https://doi.org/10.1596/978-1-4648-1259-0

18. Ekshian, E. (2025). *Blockchain in remittances: A new financial infrastructure for the developing world*. FGV Europe. https://www.fgveurope.de/wp-content/uploads/2025/02/Research-Study-Emily-Ekshian.pdf

19. El Qorchi, M. (2002). *Hawala: How does this informal funds transfer system work, and should it be regulated?* International Monetary Fund. https://www.imf.org/external/pubs/ft/fandd/2002/12/elqorchi.htm

20. European Union Blockchain Observatory & Forum. (2023). *Energy efficiency of blockchain technologies*. https://www.eublockchainforum.eu

21. EY. (2022). *How does the Ethereum Merge help the real and virtual world save energy?* Ernst & Young. https://www.ey.com/en_ch/insights/technology/how-does-the-ethereum-merge-help-the-real-and-virtual-world-save-energy

22. Federal Reserve. (2023). *Remittances and cross-border payments*. https://www.federalreserve.gov

23. Financial Stability Board (FSB). (2022). *Assessment of risks from stablecoins*. https://www.fsb.org/wp-content/uploads/P160222.pdf

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

24. Finextra. (2025). *Crypto-based remittances rise to 23% of global flows*. https://www.finextra.com/newsarticle/42353

25. Grand View Research. (2024). *Digital remittance market size, share & trends report 2024–2030*. https://www.grandviewresearch.com

26. Guo, Y., & Liang, C. (2016). Blockchain application and outlook in the banking industry. *Financial Innovation*, *2*(1), 24. https://doi.org/10.1186/s40854-016-0034-9

27. Hasan, H., & Salah, K. (2018). Blockchain applications in financial services: A comprehensive review. *International Journal of Management and Applied Science*, *10*(4), 1–5. https://www.ijcaonline.org/media/proceedings/ICAIDSC202423.pdf

28. International Monetary Fund (IMF). (2020). *Digital money across borders: Macro-financial implications*. IMF Policy Paper. https://www.imf.org/en/Publications

29. International Monetary Fund (IMF). (2025). *Fintech and cross-border payments: The role of crypto assets*. https://www.imf.org/en/Publications

30. Inter-American Dialogue. (2024). *Remittances to Latin America and the Caribbean 2024*. https://www.thedialogue.org

31. Kiayias, A., Russell, A., David, B., & Oliynykov, R. (2017). Ouroboros: A provably secure proof-of-stake blockchain protocol. In *Annual International Cryptology Conference* (pp. 357–388). Springer. https://www.iacr.org/archive/crypto2017/10401425/10401425.pdf

32. Kshetri, N. (2021). Blockchain and remittances. *IT Professional*, *23*(2), 76–81. https://doi.org/10.1109/MITP.2021.3067744

33. Migration Data Portal. (2024). *Global remittance data profile*. https://www.migrationdataportal.org

34. Migration Policy Institute. (2024). *Remittance systems in South Asia*. https://www.migrationpolicy.org

35. Mohammad, F. (2025). Blockchain-based financial services and remittances: Benefits and barriers. *Journal of Financial Innovation*, *7*(2), 85–103.

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

36. Mohan, V. (2023). Blockchain in cross-border remittances: Efficiency, transparency, and financial inclusion. *Journal of Banking and Financial Technology*, *7*(1), 59–78. https://doi.org/10.1007/s42786-023-00047-1

37. Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. https://bitcoin.org/bitcoin.pdf

38. Narula, N. (2020). Reducing remittance costs with blockchain. MIT Media Lab, Digital Currency Initiative. https://dci.mit.edu

39. Narayanan, A., Bonneau, J., Felten, E., Miller, A., & Goldfeder, S. (2016). *Bitcoin and cryptocurrency technologies: A comprehensive introduction*. Princeton University Press.

40. Organisation for Economic Co-operation and Development (OECD). (2020). *The tokenisation of assets and potential implications for financial markets*. https://www.oecd.org/finance/financial-markets/oecd-tokenisation-report-2020.pdf

41. Owolabi, T., Adeoye, O., & Bello, F. (2024). Blockchain and the future of remittances: A comparative study with SWIFT. *International Journal of Economics and Finance Studies*, *16*(3), 45–62.

42. Precedence Research. (2024). *Digital remittance market size 2024–2032*. https://www.precedenceresearch.com

43. Rühmann, A. (2020). *Blockchain remittances in Sub-Saharan Africa*. German Institute for Global and Area Studies (GIGA). https://www.giga-hamburg.de

44. Russin & Vecchi. (2023). *Vietnam embraces blockchain remittances: Ripple and TPBank case study*. https://www.russinvecchi.com.vn

45. Schär, F. (2021). Decentralized finance: On blockchain- and smart contract-based financial markets. *Federal Reserve Bank of St. Louis Review*, *103*(2), 153–174. https://doi.org/10.20955/r.103.153-174

46. SBI Remit. (2022). *SBI Remit launches RippleNet On-Demand Liquidity service*. https://www.sbigroup.co.jp/english/news/article/?id=13456

47. Scott, B. (2016). *How can cryptocurrency and blockchain technology play a role in building social and solidarity finance?* UNRISD Working Paper. https://www.unrisd.org

48. Stellar Development Foundation. (2022). *Stellar and Tempo expand remittance corridor to the Philippines*. https://www.stellar.org/blog/stellar-and-tempo

ISSN: 2455-8834

Volume:10, Issue:09 "September 2025"

49. Tapscott, D., & Tapscott, A. (2018). *Blockchain revolution: How the technology behind Bitcoin and other cryptocurrencies is changing the world*. Penguin.

50. Tayebi, A., Khan, S., & Bhatia, R. (2024). Sustainability in blockchain: Renewable integration and e-waste reduction strategies. *Sustainable Computing*, *34*(2), 210–228.

51. The Business Research Company. (2024). *Global remittances market report 2024*. https://www.thebusinessresearchcompany.com

52. TBS News. (2023). *Ripple and bKash pilot blockchain remittance corridor*. The Business Standard. https://www.tbsnews.net

53. The Business Standard. (2023). *Blockchain remittances in Bangladesh: Ripple's role*. https://www.tbsnews.net

54. Ungson, G. (2022). *Vietnam and blockchain remittances*. Asian Development Bank Institute. https://www.adb.org/publications

55. U.S. Department of the Treasury. (2021). *Report on stablecoins*. https://home.treasury.gov/system/files/136/StableCoinReport_Nov1_508.pdf

56. Visa. (2024). *The future of cross-border payments: Stablecoins and blockchain*. Visa Research. https://usa.visa.com

57. World Bank. (2024). *Migration and development brief 37*. KNOMAD. https://www.knomad.org/publication/migration-and-development-brief-37

58. Xiao, Y., Zhang, N., Lou, W., & Hou, Y. T. (2020). A survey of distributed consensus protocols for blockchain networks. *IEEE Communications Surveys & Tutorials*, *22*(2), 1432–1465. https://doi.org/10.1109/COMST.2020.2969702

59. Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance*, *21*(1), 7–31. https://doi.org/10.1093/rof/rfw074

