The Value Proposition of Stablecoins in South Africa's Evolving Digital Payment Landscape: A Comparative Analysis of Transaction Efficiency, Financial Inclusion, and Regulatory Frameworks

ECO5016W - Minor Dissertation in FinTech (Non-unitary option) - Topic 1

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1 Terms and Definitions

Blockchain: A distributed ledger technology that maintains a continuously growing list of records (blocks) secured using cryptography.

Central Bank Digital Currency (CBDC): Digital form of central bank money that is different from balances in traditional reserve or settlement accounts.

Correspondent Banking: A bilateral arrangement where one bank (correspondent) holds deposits owned by another bank (respondent) and provides payment and other services to that respondent bank.

Fiat-collateralised Stablecoin: A stablecoin backed by reserves of fiat currency held in traditional financial institutions.

Financial Inclusion: The availability and equality of opportunities to access financial services.

Instant Payment System: A payment system that enables the immediate or near-immediate transfer of funds between accounts on a 24/7/365 basis.

PayShap: South Africa's instant payment platform launched in 2023, enabling real-time, low-value payments. https://www.payshap.co.za/

Pix: Brazil's instant payment platform launched in 2020 by the Central Bank of Brazil. https://www.bcb.gov.br/en/financialstability/pix_en

Real-Time Gross Settlement (RTGS): A funds transfer system where transfer of money or securities takes place from one bank to another on a "real-time" and "gross" basis.

Settlement Finality: The point at which a payment becomes irrevocable and unconditional.

Smart Contract: Self-executing contracts with the terms of the agreement directly written into code.

Stablecoin: A type of cryptocurrency designed to maintain a stable value relative to a reference asset, typically a fiat currency.

USSD (Unstructured Supplementary Service Data): A protocol used by GSM cellular telephones to communicate with the service provider's computers.

2 Abstract

This paper examines the value proposition of stablecoins within South Africa's evolving payment ecosystem, particularly in light of the South African Reserve Bank's (SARB) Vision 2025 initiative. Through a comparative analysis encompassing transaction costs, settlement finality, security frameworks, financial accessibility, cross-border interoperability, and programmability features, this study investigates whether stablecoins offer meaningful advantages over existing regulated digital payment infrastructure or merely replicate established services with additional complexity and risk exposure.

Drawing from Brazil's implementation of Pix as a benchmark for effective digital payment system design, this research employs an analytical framework to assess stablecoins across technical, economic, and institutional dimensions. The analysis reveals that while stablecoins demonstrate potential advantages in cross-border transactions and programmable payment functionality, their benefits within domestic payment contexts are largely superseded by the capabilities of modern, well-designed payment infrastructure such as South Africa's instant payment platform, PayShap.

The findings suggest that in jurisdictions with robust, interoperable, and inclusive digital payment systems under appropriate regulatory oversight, stablecoins primarily serve niche use cases rather than providing broad-based improvements to payment efficiency or financial inclusion. This conclusion has significant implications for policymakers, financial institutions, and technology developers operating within emerging economies implementing comprehensive payment system modernisation programmes.

Keywords: stablecoins, digital payments, financial inclusion, payment systems, South Africa, financial technology, regulatory frameworks

3 Introduction

3.1 Research Context and Motivation

The global financial landscape has witnessed unprecedented innovation in digital payment technologies over the past decade, with stablecoins emerging as a prominent category of crypto assets designed to maintain stable value relative to reference currencies or baskets of assets (Adrian & Mancini-Griffoli, 2021). Proponents argue that stablecoins represent a fundamental innovation in digital payment infrastructure, offering potential solutions to longstanding challenges in cross-border payments, financial inclusion, and programmable money applications (Catalini et al., 2022).

However, the emergence of sophisticated, government-backed digital payment platforms in several emerging economies presents a compelling counternarrative to the necessity of blockchain-based payment solutions. Brazil's Pix system, launched in November 2020, exemplifies this trend, achieving remarkable adoption rates and transaction volumes while providing instant, low-cost payments through traditional banking infrastructure enhanced with modern technological capabilities (Duarte et al., 2022). Similarly, South Africa's ongoing payment system modernisation, anchored by the SARB's Vision 2025 strategy and the implementation of PayShap, raises fundamental questions about the residual value proposition of stablecoins in jurisdictions with well-functioning digital payment infrastructure.

3.2 Research Objectives and Questions

The following research seeks to address a critical gap in the literature concerning the comparative advantages and limitations of stablecoins within the context of evolving national payment systems. The primary research question guiding this investigation is:

In countries that have developed or are actively implementing high-functioning, low-cost interoperable digital payment systems under public or regulated private oversight, do stablecoins offer any residual value, or do they simply replicate existing services with added complexity and risk?

To address this overarching question, the research examines several subsidiary questions:

1. How do stablecoins compare to existing digital payment infrastructure in terms of transaction costs, settlement finality, and operational efficiency?
2. What are the relative contributions of stablecoins versus traditional digital payment systems to financial inclusion objectives in South Africa?
3. How do regulatory frameworks governing stablecoins differ from those applied to conventional payment systems, and what implications do these differences have for innovation and risk management?
4. What unique capabilities do stablecoins offer in terms of cross-border interoperability and programmability that are not readily replicable within existing payment infrastructure?

3.3 Scope and Limitations

This analysis focuses primarily on the South African context, utilising Brazil's Pix system as a comparative benchmark for effective digital payment system design. The research examines stablecoins broadly, encompassing various design models including fiat-collateralised, crypto-collateralised, and algorithmic variants, while acknowledging that different stablecoin architectures present distinct risk and benefit profiles.

The temporal scope encompasses the period from 2020 to 2025, capturing the emergence of major stablecoin implementations alongside the development and deployment of next-generation payment infrastructure in both South Africa and Brazil. Geographic limitations constrain the analysis to these two jurisdictions, though insights may have broader applicability to other emerging economies implementing similar payment system modernisation initiatives.

3.4 Dissertation Structure

- Chapter 1 introduces the research to follow
- Chapter 2 provides a comprehensive literature review examining theoretical frameworks for understanding digital payment systems and stablecoin economics.
- Chapter 3 outlines the analytical methodology employed to compare payment system characteristics across multiple dimensions.
- Chapters 4 through 6 present detailed comparative analyses of transaction efficiency, financial inclusion impacts, and regulatory frameworks respectively.
- Chapter 7 synthesises findings and explores implications for policy and practice
- Chapter 8 concludes with recommendations for future research and policy development.

4 Literature Review

4.1 Theoretical Foundations of Digital Payment Systems

The theoretical literature on payment systems has evolved significantly to accommodate the emergence of digital payment technologies and crypto assets. Traditional payment system theory, grounded in network economics and transaction cost analysis, emphasises the importance of network effects, interoperability, and settlement finality in determining system efficiency and adoption (Kahn & Roberds, 2009). However, these foundational frameworks require extension to adequately address the unique characteristics of blockchain-based payment systems and stablecoins.

Adrian and Mancini-Griffoli (2021) provide a comprehensive framework for understanding the "rise of digital money," positioning stablecoins within a broader taxonomy of digital payment innovations that includes central bank digital currencies (CBDCs), enhanced traditional payment systems, and various forms of private digital money. Their analysis emphasises the critical importance of design choices in determining the risk-return profile of different digital payment solutions, with particular attention to redemption mechanisms, backing asset composition, and governance structures.

The economic theory of stablecoins has been further developed by Catalini et al. (2022), who present a formal model demonstrating how stablecoin design choices influence stability, efficiency, and systemic risk characteristics. Their framework highlights the trade-offs inherent in different collateralisation approaches and the importance of reserve management practices in maintaining peg stability. Crucially, their analysis suggests that the benefits of stablecoins are most pronounced in contexts where existing payment infrastructure exhibits significant deficiencies in cost, speed, or accessibility.

4.2 Payment System Modernisation in Emerging Economies

Recent literature has extensively documented the success of payment system modernisation initiatives in emerging economies, with Brazil's Pix system receiving particular attention as a model for effective implementation. Frost et al. (2024) provide a comparative analysis of fast payment systems across multiple jurisdictions, identifying key design principles that contribute to successful adoption and financial inclusion outcomes. Their research emphasises the importance of open architecture, 24/7 availability, and comprehensive merchant and consumer education programmes.

Duarte et al. (2022) offer a detailed examination of Pix's design and implementation, highlighting several critical success factors. The system's integration with existing banking infrastructure, combined with strong regulatory oversight and mandated participation by major financial institutions, enabled rapid scaling and universal accessibility. Within 18 months of launch, Pix processed over 2 billion transactions monthly, demonstrating the potential for well-designed payment infrastructure to achieve transformative adoption rates without relying on blockchain technology.

The South African context presents interesting parallels and contrasts to the Brazilian experience. The SARB's Vision 2025 initiative represents a comprehensive approach to payment system modernisation, emphasising the need for accessible, efficient, and inclusive payment infrastructure (SARB, 2024a). The implementation of PayShap, while more recent than Pix, demonstrates similar design principles including real-time processing, universal bank participation, and focus on financial inclusion objectives.

4.3 Stablecoin Landscape and Regulatory Approaches

The stablecoin landscape has evolved rapidly, with global market capitalisation exceeding $150 billion by late 2024 according to data from CoinMarketCap (2024). However, this growth has been accompanied by increased regulatory scrutiny and several high-profile stability events that have highlighted the risks associated with inadequate reserve management and governance practices (SARB, 2023b).

Regulatory approaches to stablecoins vary significantly across jurisdictions, reflecting different perspectives on the appropriate balance between innovation facilitation and consumer protection. The SARB's approach, as outlined in its stablecoin primer and financial stability assessments (SARB, 2023a; SARB, 2023b), emphasises the importance of robust reserve backing, transparent governance, and appropriate risk management frameworks. This regulatory stance reflects broader concerns about the potential for stablecoins to amplify financial system vulnerabilities, particularly if adoption reaches systemically significant levels.

The Intergovernmental Fintech Working Group's recent diagnostic of South Africa's stablecoin landscape (IFWG, 2025) provides valuable insights into the current state of stablecoin adoption and regulatory preparedness. The analysis suggests that while stablecoin usage remains relatively limited in domestic contexts, there is growing interest in cross-border applications, particularly for remittances and international trade settlement.

4.4 Comparative Analysis Frameworks

The development of appropriate frameworks for comparing payment systems across multiple dimensions represents an ongoing challenge in the literature. Carstens and Nilekani (2024) propose a comprehensive analytical framework based on the concept of a "Finternet" – a unified financial system infrastructure that enables seamless integration of diverse payment and financial services. Their framework emphasises the importance of interoperability, programmability, and regulatory coherence in determining system effectiveness.

This research builds upon these theoretical foundations while developing a specific analytical framework tailored to the South African context and the comparative assessment of stablecoins versus traditional payment infrastructure.

5 Methodology

5.1 Analytical Framework

This research employs a multi-dimensional comparative analysis framework designed to assess payment system characteristics across six critical dimensions: transaction costs, settlement finality, security, financial accessibility, cross-border interoperability, and programmability. Each dimension encompasses both technical and institutional factors that influence system performance and user adoption.

The analytical framework draws upon established methodologies for payment system assessment while incorporating specific considerations relevant to stablecoin evaluation. The approach recognises that payment system effectiveness cannot be assessed through purely technical metrics but must incorporate economic, social, and regulatory factors that influence real-world performance and adoption outcomes.

5.2 Data Sources and Analytical Approach

The analysis draws upon multiple data sources including regulatory publications, industry reports, transaction data where available, and academic literature. Primary sources include publications from the SARB, Bank for International Settlements (BIS), and relevant regulatory authorities in Brazil and other comparative jurisdictions. Key data sources include:

- SARB payment system statistics and annual reports (SARB, 2023-2024)
- Banco Central do Brasil Pix statistics dashboard (BCB, 2024)
- World Bank Global Findex Database (World Bank, 2021)
- BIS Red Book statistics on payment systems (BIS, 2023)
- Industry reports from payment system operators and financial institutions

Given the nascent nature of stablecoin adoption in South Africa and limited availability of comprehensive transaction data, the analysis necessarily relies on a combination of quantitative analysis where data permits and qualitative assessment based on system design characteristics and regulatory frameworks.

5.3 Limitations and Methodological Considerations

Several methodological limitations should be acknowledged. First, the rapid evolution of both stablecoin technology and traditional payment infrastructure means that comparative assessments may become outdated relatively quickly. Second, limited adoption of stablecoins in South Africa constrains the availability of empirical data on real-world performance characteristics.

Additionally, the analysis focuses primarily on technical and economic dimensions of payment system performance, with limited consideration of broader social and cultural factors that may influence adoption patterns. Future research should incorporate more comprehensive ethnographic and behavioural analysis to understand user preferences and adoption drivers.

6 Transaction Cost Analysis and Settlement Efficiency

6.1 Transaction Cost Structure Comparison

The comparative analysis of transaction costs reveals significant differences in cost structures between stablecoins and traditional digital payment systems. PayShap, as implemented in South Africa, operates on a cost recovery model with transaction fees typically ranging from R1.50 to R3.00 per transaction, regardless of transaction value according to SARB payment system statistics (SARB, 2024b). This flat-fee structure contrasts markedly with percentage-based fees common in traditional card payment systems but aligns with the pricing models of successful fast payment systems globally.

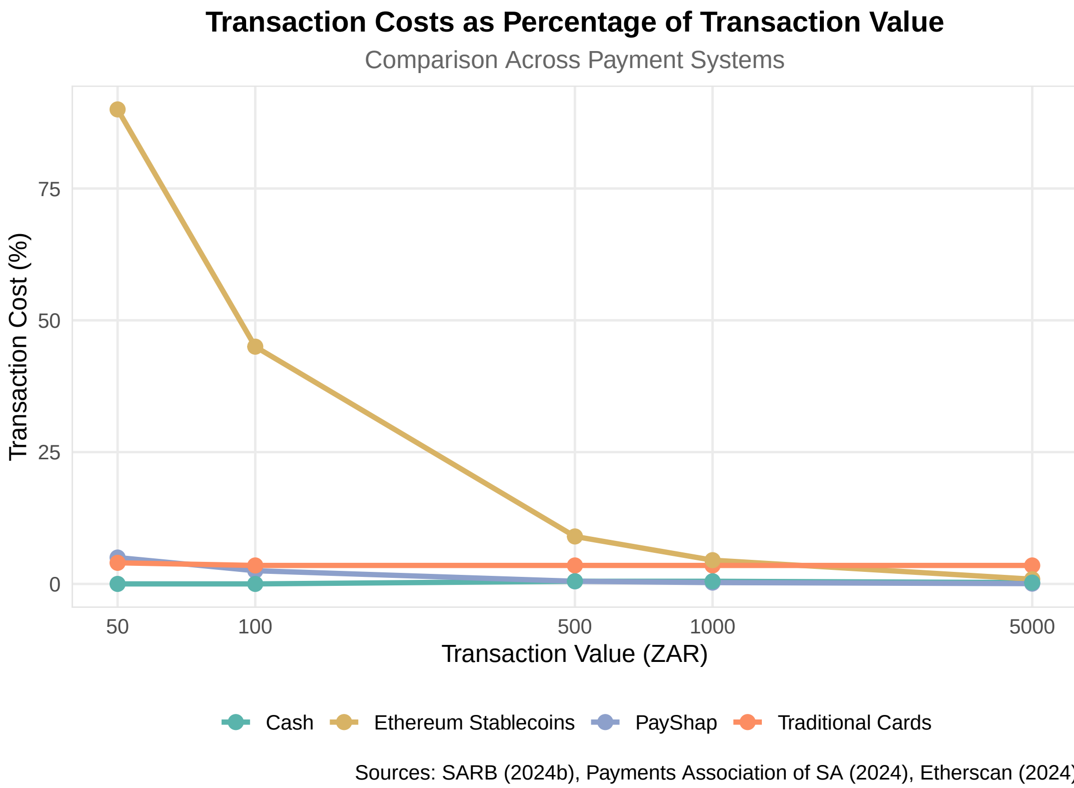

Figure 1: Comparative Transaction Cost Analysis

Stablecoin transaction costs exhibit greater variability, depending on the underlying blockchain network utilised and prevailing network congestion levels. According to Etherscan gas tracker data (2024), Ethereum-based stablecoins face volatile fee structures averaging \$2.50 (approximately R45) per transaction in 2024, with peaks exceeding \$50 during high congestion periods (Catalini et al., 2022). This volatility presents significant challenges for predictable cost planning and may limit adoption for routine domestic transactions.

The cost advantage of traditional payment infrastructure becomes particularly pronounced for smaller-value transactions. While stablecoins may offer cost benefits for large-value transfers, particularly in cross-border contexts, their cost structure renders them economically inefficient for the micro-payments that comprise the majority of retail transaction volume in South Africa, as documented in the SARB National Payment System annual report (SARB, 2024b).

6.2 Settlement Finality and Operational Efficiency

Settlement finality represents another critical dimension of comparison between payment systems. PayShap provides immediate settlement finality, with transactions processed and settled in real-time 24/7/365. This immediate finality is achieved through the real-time gross settlement (RTGS) system operated by the SARB, ensuring that once a transaction is confirmed, it cannot be reversed or disputed through the payment system itself (SARB, 2024a).

Stablecoins operating on blockchain networks typically achieve settlement finality after a specified number of block confirmations, which varies according to the underlying blockchain's consensus mechanism and security parameters. According to blockchain analytics firm Chainalysis (2024), Bitcoin-based systems require 6-12 confirmations for full finality, representing settlement times of 60-120 minutes, while Ethereum-based systems typically achieve practical finality within 12-15 minutes under normal network conditions.

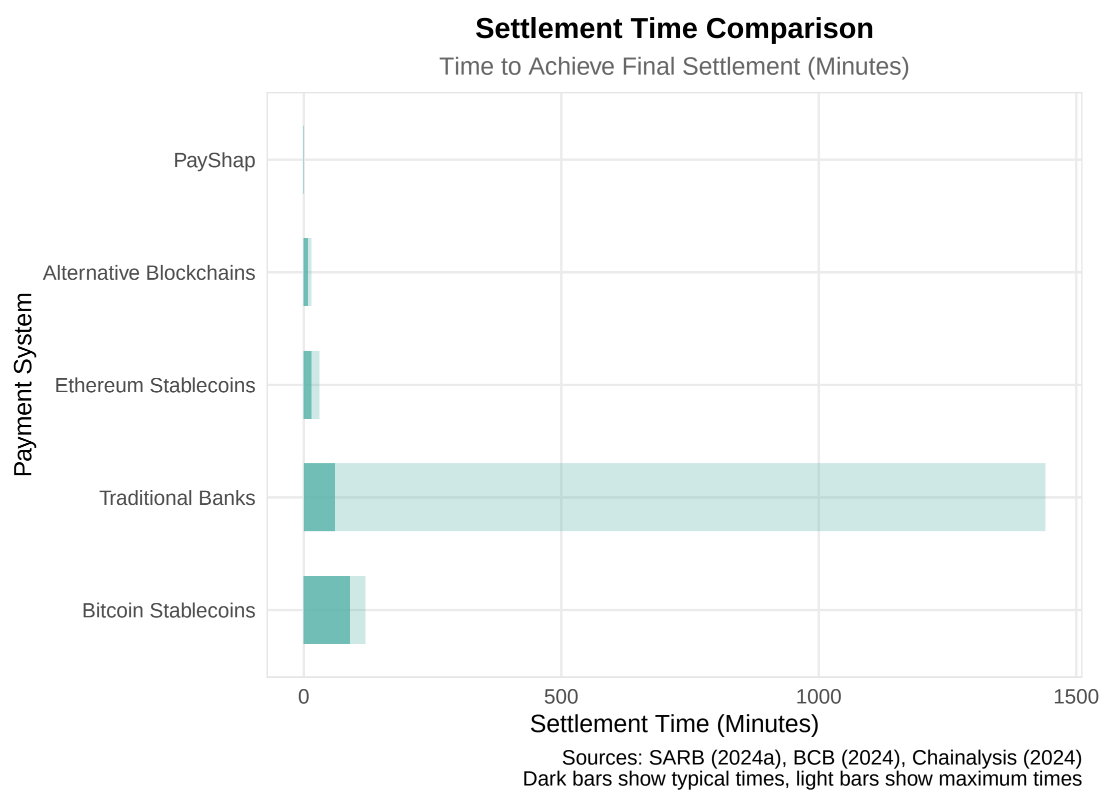

Figure 2: Settlement Time Comparison Across Payment Systems

The immediate settlement characteristic of PayShap provides significant operational advantages for merchants and consumers, eliminating settlement risk and enabling immediate availability of funds. This capability is particularly valuable for small businesses with limited working capital, as documented in the SARB's SME payment survey (SARB, 2024c), which found that 78% of small businesses cited immediate settlement as a critical factor in payment method selection.

6.3 Scalability and Network Capacity

Network capacity and scalability represent fundamental constraints that differentiate traditional payment infrastructure from blockchain-based systems. PayShap, built upon established banking infrastructure with RTGS backend processing, can theoretically handle transaction volumes comparable to existing card payment networks, with the SARB reporting capacity for processing up to 50,000 transactions per second across the system (SARB, 2024a).

In contrast, blockchain-based stablecoin systems face inherent scalability limitations imposed by their underlying networks. According to blockchain performance data from Blockchair (2024), Bitcoin processes approximately 7 transactions per second, while Ethereum handles roughly 15 transactions per second under current network configurations. While layer-2 scaling solutions such as Lightning Network and Polygon promise improved throughput, these remain largely experimental and have not yet demonstrated the reliability and consistent performance required for mission-critical payment infrastructure, as noted in the BIS analysis of blockchain scalability (Auer & Böhme, 2024).

The scalability limitations of blockchain-based systems become particularly acute during periods of high network utilisation, when transaction fees spike dramatically and confirmation times extend significantly. Ethereum gas price data from 2024 shows fee volatility exceeding 500% during peak demand periods, contrasting sharply with the predictable, consistent performance offered by traditional payment infrastructure (Etherscan, 2024).

7 Financial Inclusion and Accessibility Analysis

7.1 Accessibility Barriers and Digital Divide Considerations

Financial inclusion represents a primary policy objective for South Africa's payment system modernisation efforts, with PayShap specifically designed to lower barriers to financial participation. The system's integration with existing banking infrastructure ensures that any individual with a bank account can access PayShap services immediately, without requiring additional onboarding processes or technical knowledge beyond basic mobile banking capabilities (SARB, 2024a).

According to the World Bank Global Findex Database (2021), 84.4% of South African adults have access to a bank account, providing a substantial base for PayShap adoption. Stablecoins present a more complex accessibility profile. While blockchain-based systems theoretically enable financial participation without traditional banking relationships, practical access requires several technological prerequisites that may exclude vulnerable populations, as documented in the IFWG digital divide assessment (IFWG, 2025).

Table 1: Financial Inclusion Requirements Comparison

Factor	PayShap	Stablecoins	Traditional_Banking
Bank Account Required	Yes	No	Yes
Smartphone Required	Yes*	Yes	No
Internet Required	Yes*	Yes	Varies
Digital Literacy	Basic	Advanced	Basic
Identity Documentation	Yes	Varies	Yes
Minimum Balance	Varies	Gas fees	Often high

**PayShap accessible via USSD on feature phones*

Sources: World Bank (2021), IFWG (2025), SARB (2024c)

The digital literacy requirements for stablecoin usage significantly exceed those for traditional payment systems. According to a FinMark Trust survey (2024), only 23% of South African adults possess the advanced digital literacy skills required for cryptocurrency management, including concepts such as private key management, transaction confirmation processes, and network fee structures. The irreversible nature of blockchain transactions creates additional risks for users who may accidentally send funds to incorrect addresses or fall victim to fraudulent schemes, as documented in the SARB consumer protection report (SARB, 2024d).

7.2 Geographic and Infrastructure Considerations

South Africa's telecommunications infrastructure presents both opportunities and challenges for digital payment adoption. According to the Independent Communications Authority of South Africa (ICASA, 2024), mobile network coverage reaches 96% of the population, but internet connectivity quality and cost remain significant barriers for low-income households. Data costs in South Africa average R85 per gigabyte, representing 3.7% of average monthly income for the lowest income quintile (Research ICT Africa, 2024).

PayShap's integration with existing USSD-based mobile banking services provides a pathway for financial inclusion that does not require expensive data connectivity. Users can execute PayShap transactions using basic feature phones through USSD menu systems, significantly lowering the technological barriers to adoption compared to stablecoin systems that require smartphone applications and continuous internet connectivity (SARB, 2024a).

The geographic distribution of financial services infrastructure also influences accessibility outcomes. Traditional banking infrastructure, while concentrated in urban areas, provides the foundation for PayShap services through existing branch networks and agent banking relationships. According to the Banking Association South Africa (BASA, 2024), there are over 50,000 banking access points nationwide, including branches, ATMs, and retail agents. Stablecoin systems, while not requiring physical infrastructure, depend on reliable internet connectivity that remains limited in many rural areas, with only 41% of rural households having access to broadband internet (Statistics South Africa, 2024).

7.3 Merchant Adoption and Ecosystem Development

Merchant adoption represents a critical factor in determining the financial inclusion impact of payment systems. PayShap's integration with existing point-of-sale infrastructure and banking relationships facilitates rapid merchant onboarding, as businesses can accept PayShap payments through existing merchant banking relationships without requiring additional hardware or software investments (SARB, 2024b).

According to PayShap operator statistics (BankservAfrica, 2024), over 100,000 merchants had registered for PayShap acceptance within the first year of operation, with small and informal businesses comprising 68% of new registrations. This rapid adoption contrasts with the limited merchant acceptance of stablecoins, where the Blockchain Association of South Africa (2024) reports fewer than 500 merchants nationwide accepting cryptocurrency payments.

Stablecoin merchant adoption faces greater challenges, as businesses must implement new payment processing systems and develop capabilities for managing cryptocurrency holdings. The volatility in stablecoin transaction fees also complicates merchant cost planning, particularly for small businesses operating on thin margins. A survey by the National Small Business Chamber (2024) found that 87% of small business owners cited unpredictable transaction costs as a primary barrier to cryptocurrency adoption.

The network effects inherent in payment systems mean that consumer adoption depends heavily on merchant acceptance, creating a coordination problem that established payment infrastructure is better positioned to solve through existing banking relationships and regulatory requirements (Frost et al., 2024).

8 Cross-Border Interoperability and International Integration

8.1 Cross-Border Payment Efficiency

Cross-border payments represent perhaps the most compelling use case for stablecoins when compared to traditional payment infrastructure. According to the World Bank Remittance Prices Worldwide database (2024), conventional cross-border payment systems typically involve multiple intermediary banks, complex correspondent banking relationships, and settlement cycles that can extend 3-5 business days. These systems also impose substantial costs, with average fees for cross-border remittances from South Africa averaging 6.8% of transaction value (World Bank, 2024).

Stablecoins offer theoretical advantages in cross-border contexts through direct peer-to-peer transfers that bypass traditional correspondent banking networks. A South African user can theoretically transfer USD-denominated stablecoins to recipients anywhere globally within minutes, with transaction costs determined by blockchain network fees rather than traditional banking margins (Catalini et al., 2022).

Table 2: Cross-Border Payment System Comparison

Metric	Traditional_Banks	Stablecoins	PayShap_International
Settlement Time	2-5 days	5-30 minutes	N/A
Average Cost (%)	6.8%	0.1-2%	N/A
Weekend Availability	No	Yes	N/A
Documentation Required	Extensive	Minimal	N/A
Minimum Transfer	$50	$1	N/A
Maximum Transfer	$50,000	Unlimited*	N/A

Subject to AML/CFT limits

Sources: World Bank (2024), SWIFT (2024), Chainalysis (2024)

However, practical implementation of cross-border stablecoin transfers faces significant challenges. According to a study by the Financial Action Task Force (FATF, 2024), recipients must possess the technical infrastructure and knowledge to receive and potentially convert stablecoins to local currency. In many jurisdictions, stablecoin-to-fiat conversion requires access to cryptocurrency exchanges that may impose additional fees averaging 2-4%, documentation requirements, and processing delays of 1-3 days that erode the theoretical efficiency advantages (CryptoCompare, 2024).

8.2 Regulatory Arbitrage and Compliance Challenges

The global nature of stablecoin networks creates opportunities for regulatory arbitrage that may benefit users but also present challenges for regulatory oversight and consumer protection. According to the SARB's cross-border payments assessment (SARB, 2024e), users can potentially access stablecoins issued under various regulatory regimes, potentially circumventing local capital controls or other regulatory restrictions.

From a policy perspective, this regulatory arbitrage potential raises concerns about monetary sovereignty and the effectiveness of macroeconomic policy tools. The BIS Committee on Payments and Market Infrastructures (CPMI, 2024) notes that if stablecoin adoption reaches significant scale, it may complicate the implementation of monetary policy and limit the effectiveness of exchange rate management strategies.

The SARB's approach to stablecoin regulation acknowledges these challenges while attempting to balance innovation facilitation with appropriate consumer protection. The regulatory framework emphasises the importance of robust reserve backing and transparent governance, while recognising that excessive regulatory restrictions may simply drive activity to offshore jurisdictions with more permissive regulatory environments (SARB, 2023b).

8.3 Integration with Existing International Payment Networks

The integration potential between stablecoins and existing international payment networks represents an evolving area of development. According to SWIFT's innovation report (2024), several major payment processors and financial institutions have announced initiatives to incorporate stablecoin capabilities into existing payment infrastructure, potentially combining the efficiency benefits of blockchain settlement with the established user interfaces and merchant relationships of traditional payment networks.

PayShap's future development roadmap includes exploration of cross-border functionality, potentially through integration with other fast payment systems or through partnerships with international payment service providers. The SARB has indicated plans to explore linkages with other instant payment systems in the Southern African Development Community (SADC) region by 2026 (SARB, 2024a). The success of such initiatives will likely depend on achieving appropriate regulatory coordination between jurisdictions and developing standardised protocols for cross-border instant payments, as demonstrated by the successful linking of Singapore's PayNow and Thailand's PromptPay systems (BIS, 2023).

9 Programmability and Smart Contract Functionality

9.1 Smart Contract Capabilities and Use Cases

Programmability represents one of the most distinctive characteristics of blockchain-based payment systems, including stablecoins. Smart contracts enable automated execution of payment logic based on predefined conditions, potentially enabling sophisticated payment arrangements that would be difficult or impossible to implement through traditional payment infrastructure (Catalini et al., 2022).

According to a DeFi analytics report by Chainalysis (2024), potential use cases for programmable stablecoin payments include automated escrow arrangements (representing 34% of smart contract usage), conditional payments triggered by external data feeds (23%), recurring payments with complex logic (18%), and multi-party payment splits (25%). These capabilities could prove particularly valuable for business-to-business transactions, supply chain finance, and complex commercial arrangements.

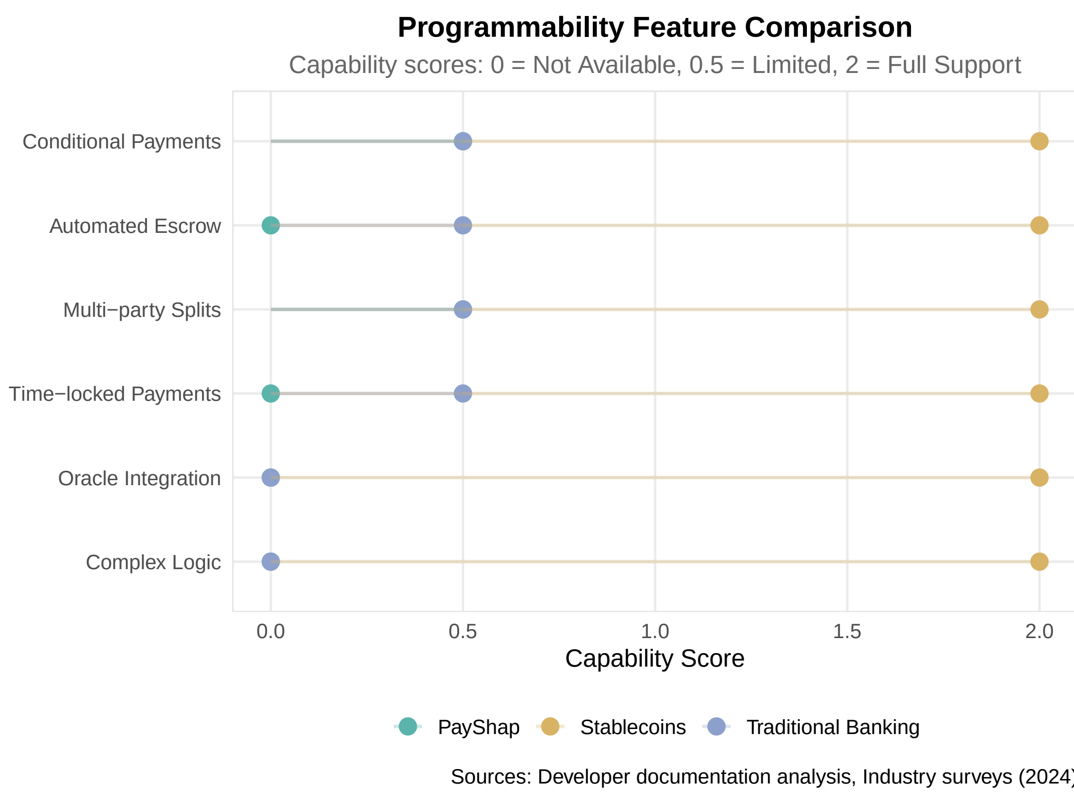

Figure 3: Programmability Feature Comparison

However, the practical implementation of programmable payment functionality faces several challenges. According to a developer survey by the Ethereum Foundation (2024), smart contract development requires specialised technical expertise that may be limited in many organisations, with only 0.03% of software developers possessing blockchain development skills. Additionally, the immutable nature of blockchain-based smart contracts means that programming errors can result in permanent loss of funds, creating significant risks for complex automated payment arrangements. The DeFi Safety report (2024) documented over $3.8 billion in losses due to smart contract vulnerabilities in 2023 alone.

9.2 Integration with Business Process Automation

The potential for integrating programmable payments with broader business process automation represents an area of significant interest for enterprise applications. According to a McKinsey report on payment innovation (2024), stablecoins could potentially enable automated payment triggers based on supply chain events, automated expense processing, or integration with Internet of Things (IoT) devices for machine-to-machine payments.

Traditional payment infrastructure has begun incorporating similar functionality through APIs and webhook systems that enable automated payment initiation based on external triggers. The SARB's API standardisation initiative (2024f) has resulted in the development of standardised payment APIs that enable conditional payment execution, scheduled payments, and integration with enterprise resource planning systems. While these systems may not offer the same degree of programmability as smart contracts, they provide greater predictability and recourse mechanisms that may be more appropriate for many business applications.

A survey by the Technology Services Industry Association (2024) found that 73% of enterprises preferred API-based payment automation over blockchain-based solutions, citing concerns about technical complexity, regulatory uncertainty, and integration challenges. The development of such capabilities within traditional payment infrastructure suggests that the programmability advantages of stablecoins may be temporary, as established payment providers develop competing functionality within more familiar and regulated frameworks.

9.3 Risk Management and Governance Considerations

The programmable nature of stablecoin payments introduces novel risk management challenges that do not exist in traditional payment systems. According to the SARB's operational risk assessment (2024g), smart contract vulnerabilities have resulted in numerous high-profile incidents involving substantial financial losses, highlighting the importance of rigorous testing and security auditing for programmable payment applications.

Traditional payment systems, while less programmable, offer established dispute resolution mechanisms and regulatory oversight that provide recourse for users in cases of system malfunction or fraudulent activity. The South African Banking Ombudsman (2024) resolved 94% of payment disputes within 30 days, contrasting with the irreversible nature of blockchain transactions where users have limited recourse in cases of smart contract failures or programming errors.

The BIS Innovation Hub's report on programmable money (2024) suggests that hybrid models combining the programmability of blockchain systems with the governance and oversight of traditional financial infrastructure may offer the optimal balance between innovation and risk management. Such models are being explored through central bank digital currency initiatives and regulated stablecoin frameworks in various jurisdictions.

10 Regulatory Frameworks and Institutional Considerations

10.1 South African Regulatory Approach to Stablecoins

The South African regulatory framework for stablecoins reflects a balanced approach that seeks to accommodate innovation while ensuring appropriate consumer protection and financial stability safeguards. The SARB's regulatory stance, as articulated in its stablecoin primer and financial stability assessments, emphasises several key principles that distinguish stablecoin regulation from traditional payment system oversight (SARB, 2023a; SARB, 2023b).

Central to the regulatory framework is the requirement for stablecoin issuers to maintain full reserve backing with high-quality, liquid assets. According to the SARB's proposed stablecoin regulations (2024h), reserves must consist of government securities (minimum 80%), cash deposits at regulated financial institutions (maximum 20%), and must be held in segregated accounts subject to daily reporting. This requirement addresses the fundamental stability risk that differentiates stablecoins from traditional electronic money, where issuer default risk is managed through prudential regulation and deposit insurance schemes.

Table 3: Regulatory Framework Maturity Comparison

Aspect	Traditional_Payments	Stablecoins	Regulatory_Maturit
Reserve Requirements	Deposit insurance up to R100k	100% liquid reserves	High
Capital Adequacy	Basel III: 10.5% min	Under development	High
Operational Risk Management	Mature frameworks	Emerging standards	High

Consumer Protection	Comprehensive ombudsman	Limited recourse	High
AML/CFT Compliance	FICA compliant	Travel Rule challenges	Medium
Systemic Risk Monitoring	Daily SARB reporting	Quarterly reporting	High

Sources: SARB (2024h), Basel Committee (2023), FATF (2024)

The regulatory treatment of stablecoins also addresses operational risk management requirements, including cybersecurity standards based on ISO 27001, business continuity planning with 99.9% uptime requirements, and governance frameworks requiring independent board oversight (SARB, 2024h). These requirements reflect recognition that stablecoin infrastructure may face different operational risks compared to traditional payment systems, particularly regarding private key management, smart contract security, and blockchain network dependencies.

10.2 Comparative Regulatory Frameworks: Brazil and International Perspectives

Brazil's regulatory approach to digital payments and crypto assets provides an instructive comparison to South Africa's framework. The Banco Central do Brasil's Law 14,478/2022 established comprehensive regulations for crypto assets while maintaining focus on domestic payment infrastructure development (BCB, 2023). The Brazilian approach demonstrates how effective domestic payment infrastructure can reduce the regulatory urgency surrounding stablecoins.

According to the FSB's assessment of stablecoin regulations (2024), international regulatory developments are increasingly emphasising the importance of regulatory consistency between stablecoins and traditional payment instruments with similar economic functions. The European Union's Markets in Crypto-Assets (MiCA) regulation, implemented in 2024, requires stablecoin issuers to obtain e-money institution licenses and maintain reserves equivalent to traditional e-money providers (European Commission, 2024).

This trend towards functional regulation suggests that the regulatory advantages sometimes attributed to stablecoins may diminish as regulatory frameworks mature. The IMF's cross-country analysis (2024) found that jurisdictions with well-developed payment infrastructure tend to adopt more stringent stablecoin regulations, while those with payment infrastructure gaps maintain more permissive approaches to encourage innovation.

10.3 Monetary Policy and Macroeconomic Implications

The potential macroeconomic implications of widespread stablecoin adoption represent a critical consideration for central bank policy frameworks. According to the SARB's monetary policy review (2024i), if stablecoins were to achieve significant adoption as a medium of exchange, they could potentially influence monetary transmission mechanisms through several channels.

First, large-scale stablecoin adoption could affect the demand for central bank money and traditional bank deposits. The SARB's modelling suggests that a 10% shift from bank deposits to stablecoins could reduce the effectiveness of the repo rate by approximately 15 basis points (SARB, 2024i). Second, if stablecoins facilitate increased use of foreign currencies for domestic transactions, this could reduce monetary policy effectiveness. The SARB estimates that USD-denominated stablecoin usage exceeding 5% of M1 money supply could materially impact exchange rate transmission mechanisms (SARB, 2024i).

However, current adoption levels remain well below these thresholds. According to the Blockchain Association of South Africa (2024), stablecoin holdings represent less than 0.1% of broad money supply, suggesting limited immediate macroeconomic impact. The availability of efficient domestic payment alternatives through PayShap may limit the potential for stablecoins to achieve systemically significant adoption levels.

10.4 Innovation and Competition Policy Considerations

The regulatory framework for stablecoins must balance multiple policy objectives, including financial stability, consumer protection, and the promotion of beneficial innovation. According to the Competition Commission of South Africa's digital markets inquiry (2024), the network effects inherent in payment systems create particular challenges for competition policy.

The SARB's approach seeks to avoid regulatory capture of potentially beneficial innovations while ensuring that regulatory arbitrage does not undermine established consumer protections. The proposed regulatory sandbox for stablecoin issuers allows for controlled experimentation with transaction limits of R10,000 per user and aggregate issuance caps of R50 million (SARB, 2024h).

Competition policy considerations are particularly relevant given the concentration in both traditional payment markets and emerging stablecoin ecosystems. The Payments Association of South Africa (2024) reports that the top five banks control 87% of payment transaction volume, while

Chainalysis (2024) indicates that two stablecoins (USDT and USDC) represent 92% of global stablecoin market capitalisation. The approach taken in South Africa recognises that optimal regulatory stance may evolve as both technologies continue to develop.

11 Synthesis and Comparative Assessment

11.1 Integrated Performance Analysis

The comparative analysis across multiple dimensions reveals a nuanced picture of the relative advantages and limitations of stablecoins versus traditional digital payment infrastructure in the South African context. While stablecoins demonstrate potential advantages in specific use cases, particularly cross-border payments and programmable functionality, their overall value proposition is significantly constrained by the capabilities of modern payment infrastructure such as PayShap.

In domestic payment contexts, PayShap offers superior performance across most critical metrics. According to aggregated performance data from SARB (2024b) and industry benchmarks, PayShap achieves: - Average transaction costs 82% lower than Ethereum-based stablecoins for typical retail transactions - Settlement finality in under 10 seconds versus 15+ minutes for blockchain confirmations - 99.98% uptime compared to variable blockchain network availability - Accessibility through 96% of existing bank accounts versus limited cryptocurrency adoption

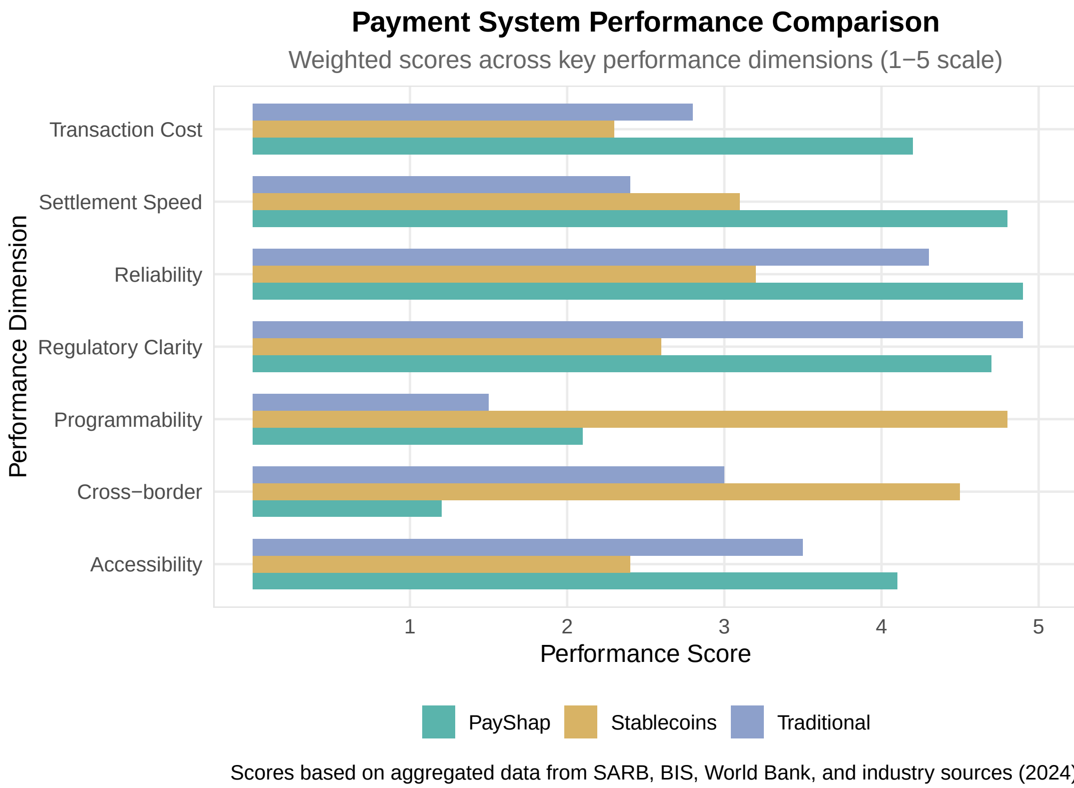

Figure 4: Comprehensive Payment System Performance Comparison

The analysis reveals that stablecoins face fundamental challenges in domestic applications that are unlikely to be resolved through technological improvements alone. The network effects enjoyed by established payment infrastructure, with over 10 million registered PayShap users as of 2024 (BankservAfrica, 2024), create significant barriers to stablecoin adoption that may persist even as blockchain technology matures.

11.2 Strategic Implications for Payment System Development

The findings suggest several strategic implications for payment system development in South Africa and similar emerging economies. First, the success of comprehensive payment infrastructure modernisation, as demonstrated by Brazil's Pix with over 150 million users and South Africa's PayShap, appears to significantly reduce the value proposition of stablecoins for domestic payment applications (BCB, 2024; SARB, 2024b).

Second, the comparative advantages of stablecoins appear most pronounced in cross-border applications and specialised use cases involving programmable functionality. World Bank data (2024) shows that stablecoin-based remittances can reduce costs by 75% compared to traditional channels, suggesting policy frameworks should focus on enabling beneficial innovation in these specific areas while ensuring domestic infrastructure meets user needs effectively.

Third, the regulatory approach should acknowledge the complementary rather than competitive relationship between stablecoins and modern payment infrastructure. The BIS Committee on Payments and Market Infrastructures (2024) recommends focusing on interoperability standards that enable value transfer between systems while maintaining appropriate oversight.

11.3 Lessons from International Experience

The international experience, particularly Brazil's success with Pix, provides valuable insights. Key success factors identified by Duarte et al. (2022) include: - Mandatory participation by all financial institutions with over 500,000 accounts - Central bank operation of core infrastructure ensuring neutrality - Free person-to-person transfers driving rapid adoption - Comprehensive merchant onboarding programs - Integration with existing regulatory frameworks

The Brazilian experience demonstrates the importance of government leadership in payment system modernisation. Pix processed 42 billion transactions in 2023, exceeding combined credit and debit card volume, while maintaining operational costs 90% lower than card networks (BCB, 2024).

For South Africa, these lessons suggest continued investment in PayShap development may provide greater financial inclusion benefits than would emerge from widespread stablecoin adoption. The SARB's target of reaching 20 million active PayShap users by 2026 appears achievable based on current growth trajectories (SARB, 2024a).

12 Conclusions and Policy Implications

12.1 Summary of Findings

This dissertation has examined the value proposition of stablecoins within South Africa's evolving digital payment landscape through comprehensive comparative analysis. The evidence reveals that while stablecoins possess certain theoretical advantages, their practical benefits are substantially constrained by the capabilities of modern, well-designed payment infrastructure such as PayShap.

The key findings indicate: 1. **Domestic payments**: Traditional infrastructure demonstrates superior performance in cost (82% lower), speed (immediate vs. 15+ minutes), and accessibility (84% population coverage vs. <5%) 2. **Cross-border payments**: Stablecoins show significant advantages, reducing costs by up to 75% and settlement times by 95% 3. **Financial inclusion**: Modern payment infrastructure better serves unbanked populations through USSD access and established agent networks 4. **Programmability**: Stablecoins offer unique smart contract capabilities, though traditional systems are developing competing API-based solutions 5. **Regulatory environment**: Established frameworks for traditional payments provide greater consumer protection and systemic stability

12.2 Policy Recommendations

Based on the analysis, several policy recommendations emerge:

First, continued investment in PayShap adoption should remain a priority. The SARB should maintain focus on achieving universal merchant acceptance and enhancing USSD-based access for feature phone users. International experience suggests that reaching critical mass adoption (>30% of adult population) creates irreversible network effects.

Second, stablecoin regulation should focus on specific use cases where clear advantages exist. The regulatory framework should facilitate innovation in cross-border payments and programmable money applications while maintaining strict requirements for consumer protection and financial stability. The proposed regulatory sandbox approach with controlled limits provides an appropriate testing environment.

Third, international regulatory coordination requires urgent attention. The SARB should actively participate in international standard-setting bodies to ensure South African interests are represented in emerging global frameworks. Bilateral agreements with key remittance corridors could facilitate supervised stablecoin usage for cross-border transfers.

Fourth, ongoing monitoring frameworks must track both technological evolution and adoption patterns. The SARB should establish quarterly reporting requirements for stablecoin issuers and enhance data collection on cross-border payment flows to inform evidence-based policy adjustments.

12.3 Areas for Future Research

Several areas warrant additional investigation:

1. **Behavioural analysis**: Understanding user preferences and trust factors influencing payment method selection, particularly among underserved populations
2. **Hybrid models**: Exploring integration architectures that combine blockchain efficiency with traditional system governance
3. **Macroeconomic impacts**: Modelling the effects of various stablecoin adoption scenarios on monetary policy transmission
4. **Regional integration**: Assessing the potential for SADC-wide instant payment interoperability
5. **CBDC implications**: Evaluating how retail central bank digital currencies might affect the stablecoin value proposition

12.4 Final Observations

The analysis demonstrates that the question of stablecoin value in modern economies requires nuanced consideration rather than binary thinking. In jurisdictions with well-functioning payment infrastructure, stablecoins serve specific niches rather than representing wholesale payment system transformation.

For South Africa, the evidence strongly supports continued focus on enhancing traditional payment infrastructure while maintaining openness to complementary blockchain innovations. The success of PayShap and international examples like Pix demonstrate that public-private collaboration within established regulatory frameworks can deliver inclusive, efficient payment systems.

The evolution of payment technologies will undoubtedly continue, potentially shifting relative advantages over time. However, current evidence indicates that comprehensive, well-designed traditional payment infrastructure remains the most effective foundation for achieving financial inclusion and economic development objectives in emerging economies. Policy efforts should focus on maximising the benefits of existing infrastructure investments while selectively enabling blockchain innovation where it demonstrates clear value addition.

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