Brazil's Financial Evolution: Unveiling the Brazil Stack

How Pix, Open Finance and blockchain-based rails are transforming the financial landscape and inspiring global innovation

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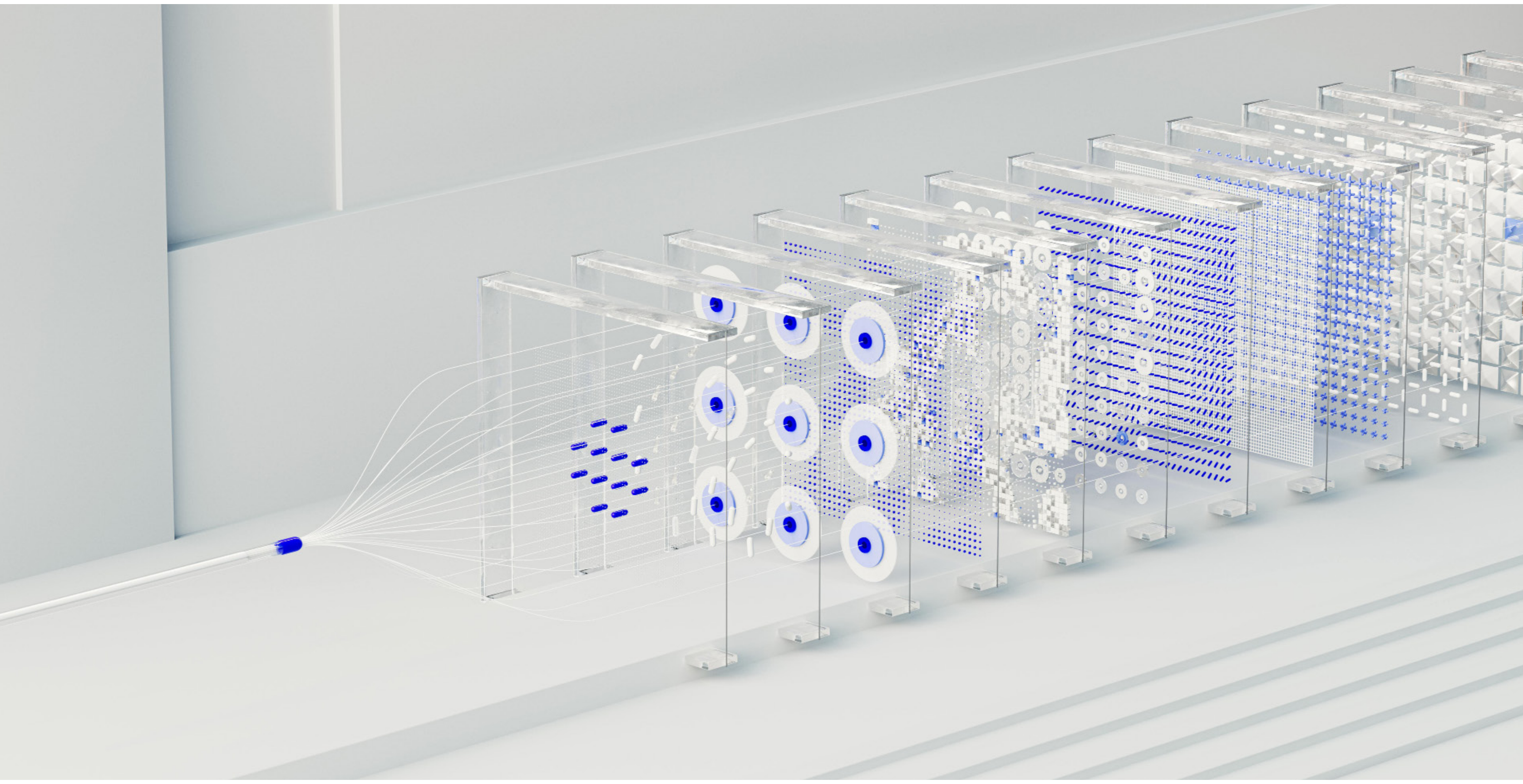

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Over the last decade, Brazil has become a global laboratory for digital finance. With more than 200 million digitally-engaged citizens, the country has built an integrated suite of tools—the "Brazil stack." This includes instant payments through Pix, open banking via Open Finance, blockchain-based financial infrastructure, a unified digital ID system (Gov.br), widespread stablecoin usage and emerging AI-driven financial services.

These innovations have expanded financial inclusion while reshaping how Brazilians transact and access financial products. Pix alone processed around 63 billion transactions in 2024, and Open Finance now makes customer data available for more than 42 million individuals across 800 institutions, according to the Brazilian Central Bank.

Brazil can offer a live example of how coordinated, inclusive digital infrastructure can accelerate the overall progress of the financial industry. As the country experiments with tokenization and AI, its experience provides valuable insights for future innovation worldwide.

Exhibit 1

Brazil: a unique digital financial system.

Brazil has rapidly emerged as one of the world's most vibrant and advanced digital finance hubs. With a Top 10 global economy, over 200 million digitally-engaged citizens and transformative regulatory leadership, Brazil presents a unique launchpad for fintech, crypto and AI-driven financial services. At the core of its success lies the "Brazil Stack"—an integrated digital finance infrastructure built on award-winning public initiatives and enabling private innovation.

Pix	Instant payment system that processed over 66.5 billion transactions in its first three years (53% YoY increase ~ 2x PayPal), surpassing debit and credit card volumes combined.
Open Finance	World's largest open-banking/finance ecosystem by API call volume (9.2 billion monthly calls vs. UK's 1.7 billion) and user base, with 42+ million individuals sharing data across 800+ institutions.
Drex	Brazil is building one of the world's most advanced blockchain ecosystems, anchored by Drex pilots and regulatory sandboxes. This infrastructure supports programmable payments, tokenization and smart contracts, creating a digital rail for banking and capital markets.
Digital identity ("gov.br")	Unified digital ID platform with 155+ million users, providing secure authentication for public and financial services, integrated with bank logins for enhanced trust and accessibility.
Stablecoin integration	Widespread use of stablecoins (with ~$55 billion transacted in 2023) for savings, remittances and commerce, reflecting Brazil's role as a major global crypto market.
AI-driven automation	Evolution from basic analytics to sophisticated "agentic" finance, leveraging Pix, Open Finance and Drex for conversational banking, automated investments and autonomous financial operations.

The state of digital banking in Brazil

Brazil's banking sector stands out globally for both profitability and scale. Valued at $200-250 billion in 2024,[1] it has grown revenues at a 16% compound annual rate since 2018 and sustained returns on equity near 20%—above the global average .[2] Inclusion has advanced in parallel: 90% of adults were banked by 2025, up from just 68% less than a decade earlier.

Retail growth has been fueled by digital-first banks and fintechs, which now hold 55% of all current accounts. Competition has intensified through lower fees, mobile-first platforms and high customer satisfaction. Pix has reinforced this shift by becoming the default payment method, displacing traditional transfers such as TED and DOC.

On average, Brazilians now maintain 4.4 bank accounts per person, pushing competition toward becoming the customer's primary financial partner.

Customer experience has become the core differentiator: 84% of Brazilians expect personalized services and are willing to share personal data in exchange for better pricing or advice.[5] For new customers, intuitive digital platforms often decide the choice of provider. Digital banks—now serving nearly half the customer base of Brazil's largest incumbents—demonstrate the power of user experience as a competitive advantage.

Traditional banks, constrained by legacy costs, are investing heavily in technology, while fintechs face profitability pressures as they scale beyond niche products. Projections suggest return on equity could narrow to 14–15% by 2030 as margins compress. Yet for consumers, the outcomes remain largely positive: broader access, lower costs and faster, more personalized services.

Driving forces behind the boom

The imperative for transformation

Fifteen years ago, only 56% of Brazilian adults were banked, and cash dominated retail transactions. The rapid spread of mobile internet—188 million users today, 99% on smartphones—changed this dynamic. Regulators seized the opportunity to modernize, aiming to expand access, cut costs and foster competition. By 2021, 84% of adults had bank accounts and cash use at the point of sale dropped to 31%.

Technological and regulatory innovation

From 2010 to 2018, reforms focused on payments, banking and lending. Pix enabled real-time, low-cost transfers, now exceeding 270 million transactions per day. New rules for digital onboarding[6] and eKYC standards[7] reduced barriers to entry, while new lending licenses (SCD)[8] allowed fintechs to extend credit directly. Together with Open Finance protocols, these measures rewired the financial architecture into a more inclusive, data-driven ecosystem.

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[1] McKinsey Global Banking Pools, company reports
[2] Countries' Central Banks
[3] Brazilian Central Bank
[4] Legacy RTGS (Real-Time Gross Settlement Systems) that took 24 to 48 business hours to settle.
[5] McKinsey Retail Banking Survey 2024
[6] Resolution 4,480/16
[7] Circular 3,813/17
[8] Resolution 4,656/18; A Brazilian fintech model that allows non-bank institutions to lend directly to borrowers using only their own capital, without taking deposits.

Exhibit 2

Declared future evolution of the regulatory framework in Brazil.

■ Implemented ■ Under implementation ■ Under discussion

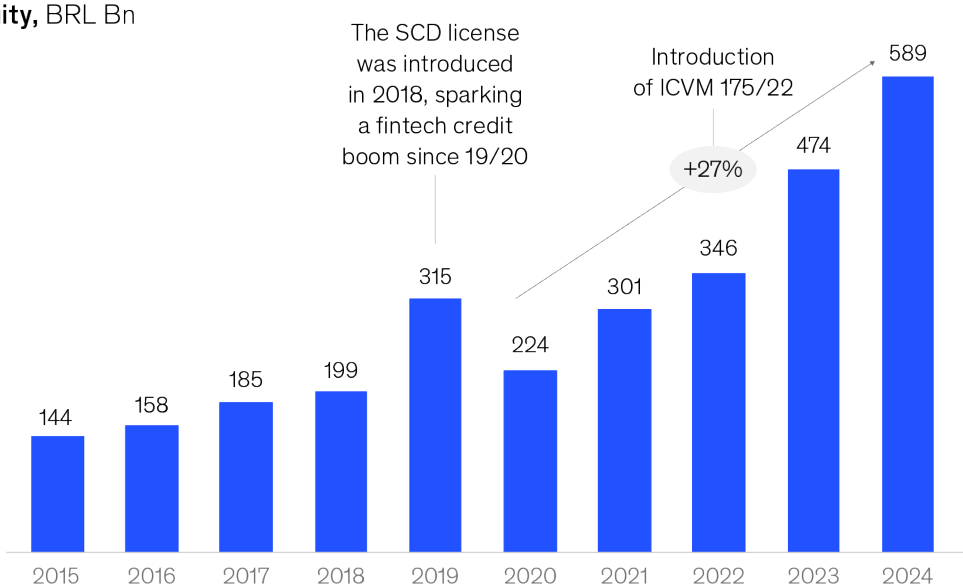
Open ecosystem for merchant acquirers Opening the market for the payment acquirers and greater acceptance of card networks	• Greater acceptance of card networks & increase in POS penetration. The biggest enabler of next generation merchant acquirers (Stone, Cloudwalk). • Before the regulation, cash dominated retail transactions, now, 14 years later, cash use at the point of sale has fallen to 31%.	
Receivables registry Card receivables must be registered	• Launched in 2021, centralized registries allowed merchants to use card receivables as collateral, with R$ 1.8Tn registered annually. The market is currently driven by CERC. • This measure lowered operational risk and facilitated access to pools of receivables by funding providers.	
Interchange limitation Limited interchange of debit and prepaid cards	• More favorable rates for merchants, stimulating card payment acceptance at the POS. • Possible impact on credit cards and fees for flag networks.	
Open Finance Regulatory framework to democratize access to financial information	• Promotes transparency across the financial system. • Enables data sharing among multiple institutions.	
Pix Instant payment system created by the Central Bank of Brazil	• Zero transaction costs for consumers and merchants. • Expands electronic payments.	
Drex Central Bank Digital Currency (CBDC) issued through a distributed ledger technology (DLT)	• Enhances safety and transparency. • Supports smart contracts and automated transactions. • Enables faster settlement with lower costs for capital markets.	22 countries have already launched CBDC (Central Bank Digital Currency) pilots worldwide.
Revolving and installment limitation Policy discussions to reduce household indebtedness	• Limits excessive interest revenue from installments. • Creates better conditions for installment prepayment markets.	
SuperApp Bacen A financial aggregator that integrates all user accounts into one platform	• Improves price and information transparency across banks. • Offers a unified customer experience through a central app.	India has an aggregator agenda that is evidence for greater financial inclusion.

From 2019 to 2024, reforms turned to capital markets. A series of regulatory changes[9] boosted agility, transparency and broader participation, fueling one of the fastest-growing asset classes in the market: FIDC (Credit Receivables Investment Funds).[10] FIDC assets under management rose from $15 billion in 2015 to an estimated $110 billion in 2025, a compound annual growth rate of 27%. Today, FIDCs account for roughly one-quarter of Brazil's structured credit market, channeling institutional capital into digitally-originated lending.

Exhibit 3

The FIDC market grew exponentially in 5 years and expanded access to capital and credit.

FIDC Equity, BRL Bn



25%

of Brazil's current structured credit market is centered around FIDC

Startups that benefited from the FIDC structure

Source: ANBIMA

Toward a digitally-native financial system

With its payment rails, regulatory frameworks and capital markets modernized, Brazil now operates as a full-stack digital financial system. Venture investors have poured $12 billion into fintechs over the past five years, accelerating innovation.

Financial services are increasingly modular, interoperable and digital by default. Transparent infrastructure allows capital to flow more efficiently to underserved sectors. Middleware providers that offer infrastructure-as-a-service—such as receivables registration and verification—have become critical enablers of this high-trust, high-volume system.

Still, challenges in scale remain. Corporate credit amounts to just $694 billion, or 32% of GDP in Brazil, compared to 73% in the United States. This $890 billion potential credit gap underscores the need to expand business credit infrastructure and attract more private-sector capital to continue fueling growth.

[9] Relevant regulations include Resolution 4,734/19, Resolution 5,094/23, CVM Resolution 175/22 and Law 14,420/22.
[10] Brazilian Credit Receivables Investment Funds (FIDCs) that pool investors' capital to purchase and manage credit rights, commonly used for securitization and structured finance.

The Brazil stack: four pillars of innovation

The unique interplay of transformative technologies that comprise the Brazil stack forms a synergistic ecosystem that drives economic value and is notable in the context of digital finance innovation.

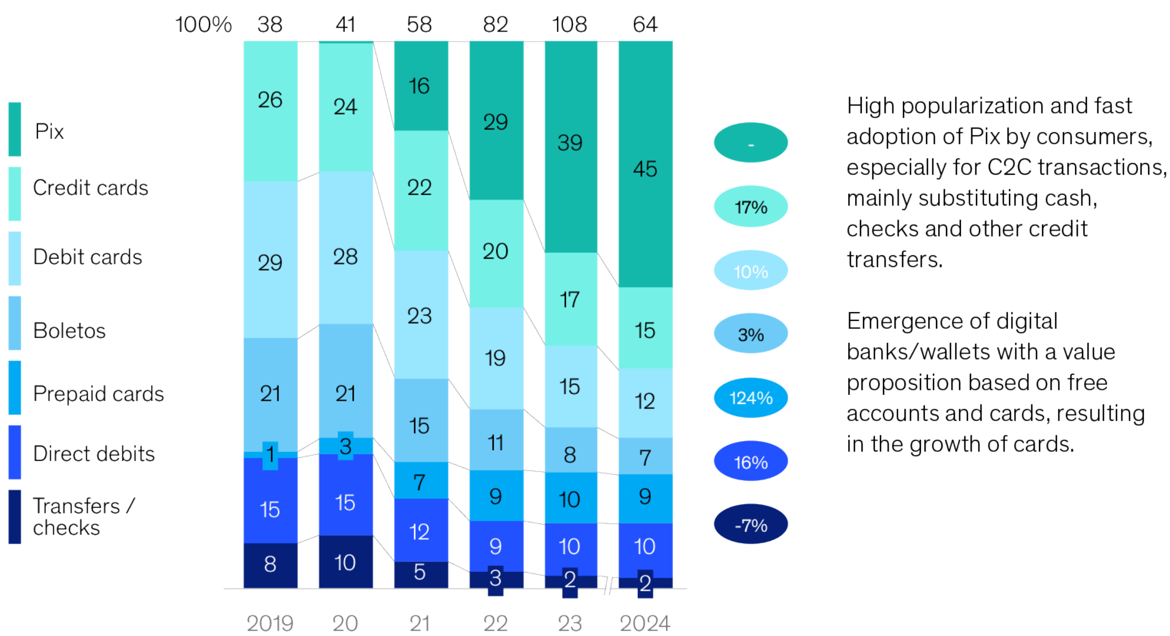
Pix–Instant payments driving inclusion and liquidity

Launched in 2020, Pix now has 158 million users. Free peer-to-peer transfers and low-cost merchant payments have formalized informal economies and cut transaction costs to an average of 0.22%—far below the 2.2% typical of card payments. To date, Pix has brought 71.5 million Brazilians into the digital payments system.

Exhibit 4

The introduction of Pix was a milestone for electronic payments in Brazil, intensifying the substitution of cash, TED/DOC and cards.

Number of payment transactions, %, # of transactions; billion transactions



98% of registered users have already used Pix

~160.5M consumers registered

7% of banked population already registered

879M registered keys

15.8M companies registered

Source: Central Bank; CIP; press clippings; McKinsey Global Payments Map 2024

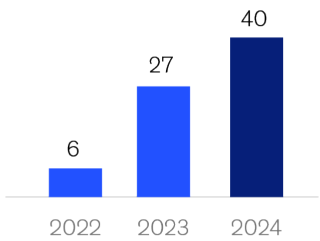
Open Finance – Data-Driven Competition and Innovation

Introduced in 2021, Brazil's Open Finance framework manages over 64 million active data-sharing consents and processes 9.2 billion monthly API calls (vs. 1.7 billion in the U.K.). By enabling AI-driven optimization across lending, wealth management and insurance, Open Finance has lowered entry barriers and intensified competition.

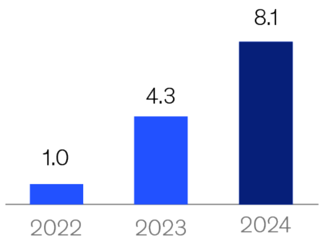
Exhibit 5

Brazil's Open Finance initiative stands as one of the most ambitious and comprehensive data-sharing frameworks globally.

Number of active users, Mn



Number of monthly API calls, Bn



Participating institutions

940+

In 2024
Brazilian Open Finance processed +5x of API calls per month than the UK (~1.7Bn) 15% of banked Brazilians adhered to Open Finance

Expansive scope
Holistic approach, offering a 360-degree view of the customer's financial life, contrasting with the narrower focus of regimes like the UK's or the EU's PSD2.

Rapid adoption & high usage
User adoption reached levels in two years that took the UK more than five.

Driving competition & innovation
Secure, consent-based access to comprehensive financial data allows applications that offer hyper-personalized solutions, fostering intense competition and innovation

Foundation for agentic finance
Open Finance provides the essential data layer for AI agents.

Source: Open Finance Brasil

Programmable finance for a tokenized economy

Brazil's path toward programmable finance has been marked by experimentation and collaboration among regulators, financial institutions and technology companies. The Drex initiative has been central to this journey, with banks, fintechs, crypto-native companies and technology providers participating in two pilot phases as well as the LIFT Challenge Digital Real (CBDC Lab). These efforts tested real-world use cases on-chain, including EVM-compatible network deployment, settlement flows (DvP and PvP), asset tokenization and interoperability between Drex's ledger and public blockchains. The result has been the accumulation of technical knowledge and institutional capacity that is now informing the broader financial ecosystem.

The pilot program is entering its third phase, focused on non-DLT architectures such as a lien registry for credit markets. This marks an expansion of scope, even though the Central Bank has indicated that DLT remains a medium-term priority—particularly as privacy solutions mature. In parallel, working groups such as Tokenization Task Forces and regulatory sandboxes run by both the Central Bank and the CVM (Brazil's securities regulator) continue to advance experimentation with distributed ledger technologies (DLT), ensuring sustained engagement in building the foundations of tokenized finance.

The CVM is also modernizing Brazil's capital markets regulation with several initiatives. One of the most notable is the forthcoming CVM 135 "lite" framework, which aims to simplify requirements for regulated markets and allow Central Securities Depository (CSD) activities to be recorded on blockchain networks. CVM Resolution 88, originally created to update Brazil's crowdfunding rules and give startups and SMEs easier access to capital, is also being reformed. The changes under discussion include raising issuance limits, updating disclosure rules and explicitly recognizing blockchain tokenization. The most significant shift could be the creation of regulated secondary markets for tokenized securities—moving CVM 88 beyond crowdfunding to a broader role in integrating tokenized assets into Brazil's financial system.

Alongside these reforms, CVM has partnered with FENASBAC (the National Federation of Central Bank Servants) to launch LEAP, a lab for testing blockchain-based solutions under regulatory oversight. In parallel, ANBIMA—the Brazilian Financial and Capital Markets Association, which co-manages the Selic settlement system with the Central Bank—has teamed up with FENASBAC to develop a tokenization network.

Finally, the Central Bank is preparing a regulatory framework for stablecoins, which are expected to serve as the on-chain payment leg in tokenized transactions. Alongside tokenized deposits linked to Drex and other blockchain networks, this framework would provide the liquidity and infrastructure required to integrate programmable assets into the financial system.

Taken together, these initiatives highlight that Brazil's progress is not the result of one project but of iterative experimentation cycles. Through Drex, sandboxes and public–private blockchain networks, the country has built the technical expertise, institutional knowledge and regulatory clarity to position itself as a global leader in the transition toward a DLT-enabled financial system.

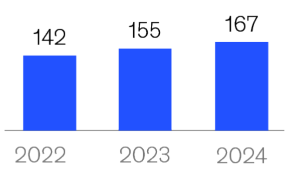
Gov.br – Digital identity as a foundational enabler

With 155 million users, Gov.br links national IDs to secure authentication levels, reducing fraud and streamlining onboarding. Its near-universal adoption highlights the central role of digital identity in a modern economy.

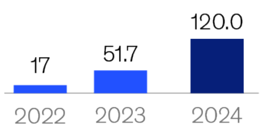
Exhibit 6

Gov.br is Brazil's unified digital identity platform, providing citizens a single, secure login linked to their national ID.

Number of users, Mn



Number of electronic signatures, Mn



By May 2025, Gov.br had been responsible for 269.4 Mn electronic signatures since its launch in 2020

Massive adoption
155+Mn registered users by late 2023 (over 90% of adults).

Tiered security architecture
Bronze, Silver and Gold assurance levels, through stronger verification methods (e.g., biometric checks).

Unique financial services integration
Users can verify their identity through online banking (13 major banks participate), authenticate access to financial platforms and enable digital signatures.

Enabling infrastructure
Gov.br provides a foundational trust layer, facilitating secure online onboarding, reducing identity fraud and creating a cohesive ecosystem when linked with Pix, Open Finance and Drex.

Source: Gov.br data

The next wave of disruption

Building on the foundation of the Brazil stack, the country now has key ingredients for its next financial revolution. Four core innovations—Pix, Open Finance, blockchain-based rails and agentic finance—are converging to form a cohesive financial ecosystem. Together, they can unlock new economic value and enable novel use cases.

The first wave focused on speed, accessibility and software-driven control of payments through Pix and Open Finance. The second wave emerged with programmable finance, enabled by blockchain-based infrastructure and smart contracts. Tokenization and programmability have allowed assets to be digitized and traded seamlessly, enabling complex processes—such as delivery-versus-payment (DvP) and collateralized lending—to be executed automatically and securely, unlocking liquidity in markets that were previously illiquid.

The third and most transformative wave is intelligent finance, where AI converges with Pix, Open Finance and blockchain-based rails to create autonomous financial systems. AI agents, powered by real-time data from Open Finance, can analyze a user's financial profile, identify opportunities, and execute transactions autonomously. These agents interface with smart contracts and tokenized assets, acting as a new operational layer in the financial ecosystem.

The business implications are profound. For consumers, integration with digital assets enables conversational payments and hyper-personalized financial management. For businesses, intelligent finance streamlines operations through automation and optimized financing. The combined effect allows Brazil to leapfrog traditional systems and set a global benchmark for innovation.

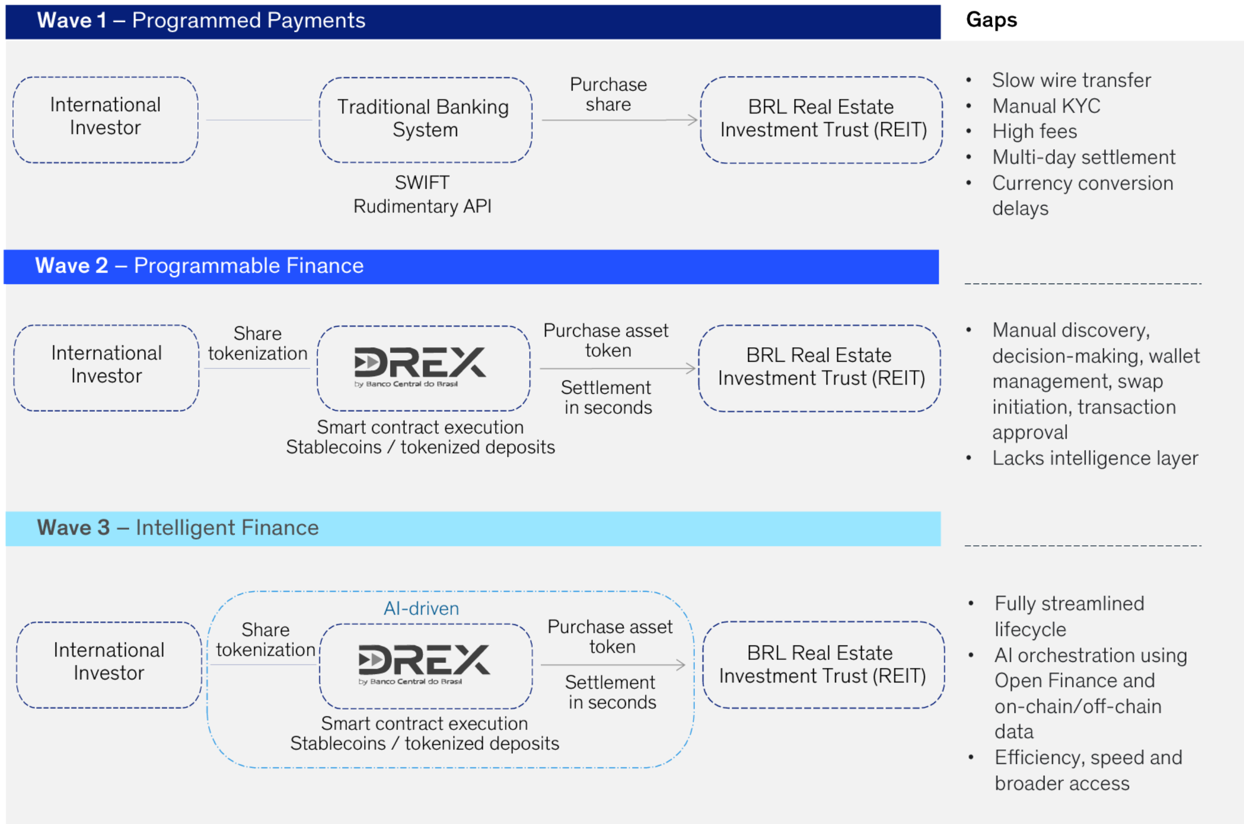
As these waves of disruption unfold, opportunities for value creation expand—from enabling fractional ownership of assets to automating complex financial workflows. Collectively, these services lower barriers to digital banking, especially for less tech-savvy users who can interact with banks conversationally. As AI capabilities mature, more advanced tasks will further reduce friction in everyday finance.

Brazil may become a global testing ground for financial innovation—supported by forward-looking regulation, robust digital infrastructure and a digitally-engaged population. With Pix, Open Finance and blockchain-based rails, the country is laying the foundation for AI-driven "agentic finance," an emerging frontier in the evolution of financial services.

Exhibit 7

Illustrative example across the three waves: investing in fractional real estate.

International investor wishes to purchase a share in a Brazilian Real Estate Investment Trust (REIT) or property fund.



Source: Open Finance Brasil

Brazil's integration of fintech, crypto and AI is advancing quickly, but the road ahead is not risk-free: the same forces that make the country a global pioneer in digital finance could just as easily transform into its greatest vulnerabilities if left unchecked. As adoption of Pix and Open Finance expands, so does the attack surface for fraud, identity theft and cybercrime.

If breaches or large-scale scams undermine trust, momentum could potentially stall. Similarly, while Drex and tokenized finance promise efficiency, they could also generate new operational risks: failures in smart contracts or instability in stablecoin frameworks could wane the pace of adoption. Guarding against systemic vulnerabilities while continuing to foster innovation will be key.

Structural hurdles also loom. Corporate credit remains underdeveloped compared to peers, and without deeper business lending rails, large segments of the economy may remain underserved. Digital literacy gaps risk excluding parts of the population, while unequal access to infrastructure could widen, rather than close, socio-economic divides. Finally, with AI-driven "agentic finance" on the horizon, there is a risk of over-automation—where opaque algorithms make financial decisions that users could struggle to understand or contest.

Brazil may be ahead of the curve, although sustaining that leadership will depend not just on technology, but on trust and execution. The country's future as a digital finance leader will depend not just on how fast it innovates, but on how well it manages the risks along the way.

When the lab goes live: Implications for key stakeholders

The digitalization of financial markets is reshaping Latin America and this transformation carries significant implications for multiple stakeholders. As innovators capitalize on the opportunities presented by blockchain-based systems, traditional banks face both challenges and opportunities. Those that fail to adapt risk losing market share to more agile fintechs and decentralized finance (DeFi) platforms. Conversely, banks that embrace new technologies can unlock innovative business models and revenue streams, positioning themselves to thrive in a more dynamic ecosystem.

The payments industry is also poised for disruption. By integrating digital assets into their offerings, payment providers can enhance customer experience, reduce operational costs and establish themselves as industry pioneers. Efficiency gains from such integration could lower cross-border transaction costs by up to 60%. This trend is already visible, as fintechs and non-banks captured nearly 30% of all cross-border transactions in 2024.

Wealth and asset management firms are also undergoing a paradigm shift as tokenization and DeFi democratize access to new asset classes. Retail and institutional investors alike are gaining entry into opportunities such

Exhibit 8

The top three segments represent an $825B+ revenue pool and $370B+ in efficiency gains only in the Americas.

		Cross-Border Payments	Tokenized Government Bonds	Tokenized Private Credit	Current state of the market
Brazil	2025 Revenue Pool[1]	$27.7B	$5.8B	$7.9B	Brazil is set to lead tokenization, backed by a **$400B+ private credit market**, high-yield government debt, favorable regulatory authorities and early investments from incumbent banks.
	Efficiency Gains[2]	$9.7B	$8.7B	$6.3B	
Mexico	2025 Revenue Pool[1]	$19.9B	$12.3B	$1.9B	Driven by decades of US migration, Mexico is a top stablecoin adopter with **a compelling GTM strategy for entrants** in this space; tokenizing even a fraction of this corridor could unlock billions in new flows.
	Efficiency Gains[2]	$7.0B	$18.5B	$1.5B	
Argentina	2025 Revenue Pool[1]	$7.3B	$3.3B	$2.7B	Hyperinflation and currency risk made stablecoins a mainstream hedge in Argentina, **paving the way for tokenized debt and other financial instruments.**
	Efficiency Gains[2]	$2.6B	$4.9B	$2.1B	
Rest of Latam	2025 Revenue Pool[1]	$21.8B	$7.0B	$20.5B	From tokenized bond pilots in Chile, Colombia and Peru to El Salvador's Bitcoin treasury, **Latam has a strong fintech DNA and region-wide opportunities.**
	Efficiency Gains[2]	$11.8B	$10.6B	$16.3B	
United States	2025 Revenue Pool[1]	$291.6B	$311.1B	$84.7B	**BlackRock and Franklin Templeton's** tokenized money-market funds already total close to $4B in AUM. With the Genius Act, the US is poised to bring institutional tokenization to the mainstream.
	Efficiency Gains[2]	$72.9B	$133.3B	$67.3B	

[1]Revenue Pool: Potential monetization for each vertical after being completely tokenized;
[2]Efficiency Gains: The difference between revenue pools in TradFi and DeFi
Source: Valor Capital Estimates

as tokenized real estate, crypto ETFs and high-yield DeFi products. Firms that innovate in this space can gain a competitive edge, but must also navigate complex regulatory requirements and an evolving infrastructure.

Capital markets are evolving in parallel with the growth of digital assets and tokenization. New asset classes, liquidity channels and DeFi protocols are enhancing efficiency, transparency and market access.
For traditional financial institutions, adopting digital asset infrastructure presents opportunities to diversify offerings, generate new revenue streams and expand their role in an increasingly digital marketplace.

As other countries adopt real-time payments, data sharing and programmable finance, Brazil's journey underscores the importance of regulation, infrastructure and experimentation. The future of finance will be defined by those willing to embrace change.

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