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# REPORT

## Fintech Innovation in Latin America

May 2024

# Realization & Authors

PLUGANDPLAY

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The Next acceleration program, now in its fourth edition, is an online acceleration program for high-growth startups. It helps startups develop their business areas and connects them with major financial market companies to solve problems within the innovation chain. **The program has already accelerated 30+ startups from Brazil and abroad.**



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# About the Report

This report, written by **Plug and Play** and **Fenasbac,** aims to explore all the major technological changes happening to the financial ecosystem in Latin America, more specifically in Brazil, and how the regulator played a significant role in those advancements — the year 2022 witnessed a remarkable surge in the number of fintech companies registered in the region, surpassing 1,500. This impressive **growth of 47%** compared to the previous year solidified the position of financial technology as a transformative and influential force in the region, indicating that it is more than just a passing trend.

We would like to thank the following experts for their time and insights:

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Plug and Play and Fenasbac are solely responsible for the content of this report. The findings and views expressed herein do not necessarily reflect those of our interviewed experts.

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# Foreword: Why LatAm Became the Birthplace of Fintech Innovation

A combination of widespread and early technology adoption, a mature financial system and financial regulation, and remarkably technical and forward regulators put Brazil in a unique position to develop financial innovation. Also, adopting technology in financial services has proven to be an effective tool to address a long-standing problem in Latin American countries: the low financial inclusion rate. Following Brazil's blueprint, other Latin American countries saw technology opportunities.

Peter Tufano, professor at Harvard Business School, in an article entitled "Financial Innovation" discusses that financial innovation can come from a few different economic biases, such as (i) to complete inherently incomplete markets (i.e., unmet needs or preferences of clients); (ii) to address inherent agency concerns and information asymmetries; (iii) to enable parties to minimize search, transactions, or marketing costs; (iv) a response to taxes and regulation (e.g. decoupling economic ownership or exposure from legal ownership governance and tax implications); (v) a response to globalization and increasing risks; and (vi) the result of technological shocks.

Starting from Tufano's premises, it is clearer to understand the tremendous upward movement of financial innovation in Latin America, with Brazil as its leading actor. Financial inclusion in the region has been historically low: between 30% and 50% of the area's population still struggles to obtain adequate banking services.

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# Foreword: Why LatAm Became the Birthplace of Fintech Innovation

In addition, there has been a great dependence of the region's economies on traditional means of banking, which, given the concentration on large players, very little has been done to reduce paper-based transactions and the exhausting bureaucracy of the antiquated bank branch queues. Not only that, but the apotheotic insurgence of the COVID-19 pandemic has made evident the flaws and the opportunities of a globally essential but extremely obsolete market in financial and customer service technologies.

They were combined with a predisposition on regulators' part to make the possibility of having a bank account increasingly accessible, for example, with Mexico's "Ley Fintech" and the Central Bank of Brazil's BC+ Agenda. With principles such as (i) greater financial citizenship, (ii) more modern laws, (iii) a more efficient financial system, and (iv) more accessible credit, in Brazil, for example, the regulatory environment was ideal for the boom to occur. With that, what was once a bunch of pie-in-the-sky ideas became a perfect storm of economic innovation regarding the Private and Public sectors.

In essence, a major regional problem of the exclusion of a large part of the population from access to traditional banking services, high levels of bureaucracy, and a low level of digitalization of the economy has turned into a gigantic opportunity. Not surprisingly, the abrupt growth of fintechs like NuBank exemplifies this favorable environment. The question is whether this will be necessary to bring Latin America up to the level of global competition, capable of rivaling the banking markets of developed economies.

The daunting task is to sustain the sudden growth achieved by a long, virtuous period of innovation, customer growth, and access to services. In Brazil, measures such as the creation of PIX and the recently presented DREX are positive signs that this can indeed happen.

Brazil managed to significantly address these challenges with a combination of regulatory measures, which include the enactment of a Payments Law and related regulation in 2013, the creation of a light financial institution license entirely operated electronically in 2018, the adoption of open banking and the creation of PIX (the instant payments system in 2020). In the last year, the country's financial regulators turned their attention to the regulation of services involving blockchain, virtual assets, and tokenization in the financial system, as well as the use of artificial intelligence by regulated players and its effects on the economic system, leading the discussions in the region.

As Tufano observes, innovation arises from the recognition of issues that, at the time, were inherent to Latin America's developing countries. When these issues are finally solved to a large extent, it will be interesting to see whether the region will continue to be the protagonist in financial innovation.

# Pix and Real-Time Payments

In this chapter, we will explore the various innovations in real-time payments, especially Pix, which became the second-largest solution in the world in record time.

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# What is Pix?

The emergence of Pix, a real-time payment system in Brazil, marked a significant step in the country's financial evolution. Despite having a robust payment system since the Brazilian Payment System (SPB) restructuring in 2002, the government still heavily relied on cash transactions. In fact, in 2019, 77% of transactions were conducted using cash.[1]

The reliance on cash is noteworthy due to the high societal costs it imposes. Producing, storing, distributing, and destroying cash is an expensive process, a cost that often goes unnoticed by the public but ultimately trickles down to them. Moreover, significant costs are associated with the security and movement of cash, particularly for retail companies that accept cash payments. These costs are inevitably incorporated into the pricing of banking and payment services and, subsequently, into the final prices of goods and services. Also, it is not suitable for e-commerce, an industry that is becoming increasingly relevant in the country. It also does not allow for installment payments, a feature often required by consumers.

Furthermore, an assessment by the Brazilian Central Bank found that other payment methods— including electronic ones — had substantial gaps.[2] These gaps are mainly related to convenience and costs for end users. The need for a solution that addresses these issues was evident, setting the stage for introducing a new, efficient payment method.

The Central Bank of Brazil (BCB) sought to address this inefficiency and encourage digitization by introducing Pix. The BCB led the creation of this new electronic payment method, aiming to make the retail payment market more efficient, secure, competitive, and inclusive.

Pix, a real-time payment technology in Brazil, allows a wide variety of users, including individuals, firms, and government entities, to access payment services delivered by designated financial and payment institutions called "participants" or "payment services providers (PSPs)." The Central Bank of Brazil (BCB) owns the payment scheme and manages a real-time settlement infrastructure and a user address database. Payment services may include instant or scheduled payments and transfers, cash withdrawals, and payment invoices. Users can also incur short-term borrowing via Pix, and authorities can now track monthly payment activity on a granular basis.

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# What is Pix?

Participants in the Pix system, which consists of institutions regulated by the BCB, other institutions outside the regulatory perimeter, or non-regulated institutions providing services indirectly via a regulated institution, are subject to BCB regulatory requirements. While Pix activity is mainly conducted via domestic and foreign banks, payment institutions and fintech entities also participate significantly. Regulated participants with over five hundred thousand accounts must participate in the system; others may participate voluntarily.

All participants are subject to proportional risk-based supervision by the BCB and basic regulations for liquidity risk management, cybersecurity, data usage, and AML/CFT procedures. The BCB also sets standards for participants to provide users with simple and intuitive access to the Pix system. To ensure system liquidity, the BCB remunerates the balances of all direct participants' accounts in SPI and provides liquidity lines to participants with direct access to the SPI.

## The success of Pix can be attributed to several unique design features[3]:

**Speed of Transactions:** Unlike debit cards, which take two days, and credit cards, which take 28 days, a Pix payment settles in an impressive average of just 3 seconds. This near-instantaneous processing is a significant advantage.

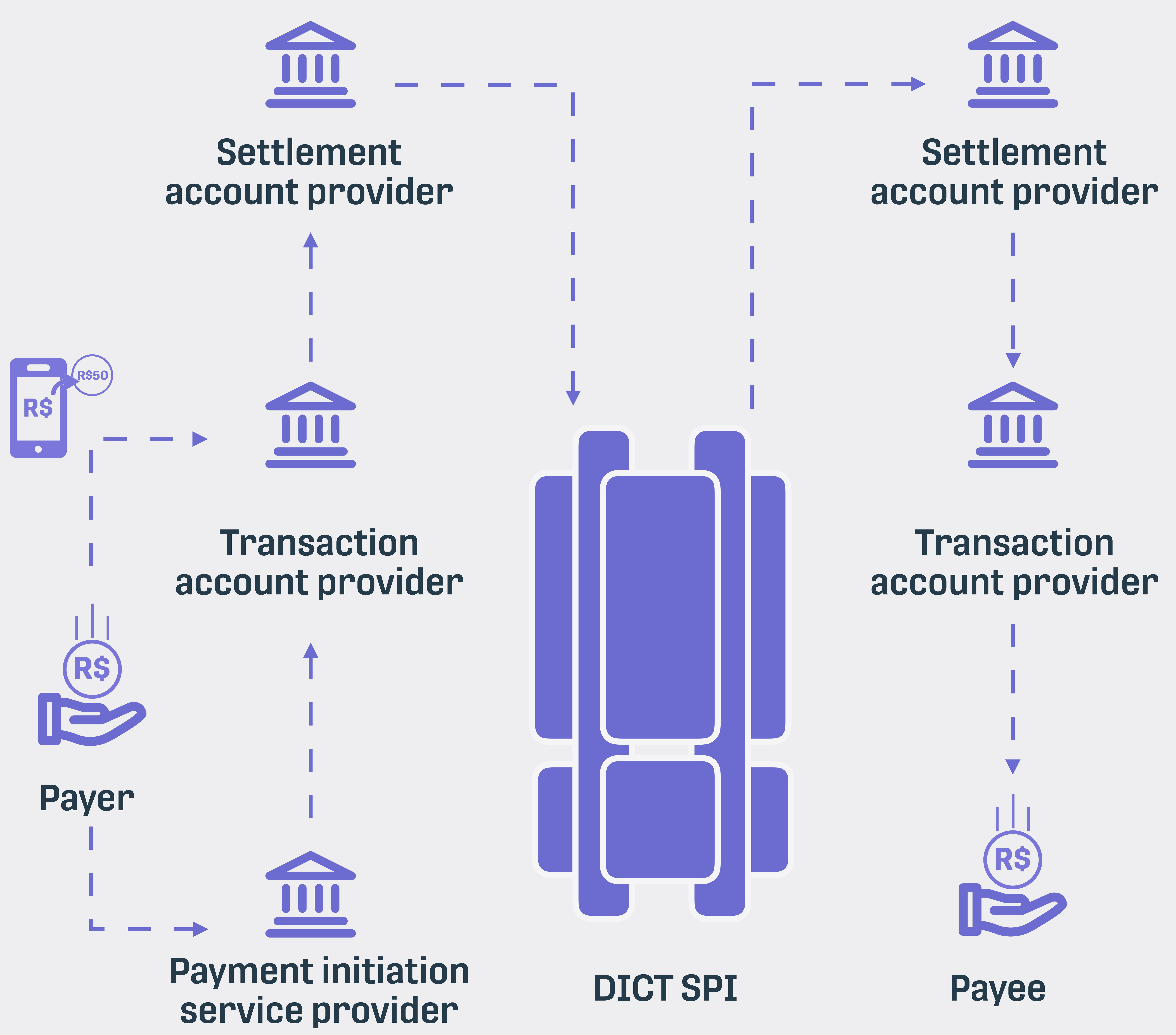
**Role of the BCB:** The Central Bank of Brazil (BCB) acts as the infrastructure provider and regulator, preventing large technology companies from quickly gaining substantial market share and extracting fees from participants, ensuring a fair and competitive landscape.

**Mandatory Participation by Big Banks:** The mandate for major banks to participate in the system has contributed to Pix's success. These institutions worked together to overcome interoperability challenges, enabling an effective network from the start.

**Flexible Transaction Sizes:** Although the authorities do not impose a limit on the size of a transaction, participants may set their own limits based on a user's risk profile. This allows the system to cater to a wide range of users, from households to corporations, each with different standard transaction sizes. The real-time availability of both payment and credit information on users allows these limits to be accurately set.

**Low Transaction Costs:** The authorities have set a requirement for Pix to be free for individuals. For firms or merchants, the payment transaction cost is a mere 0.33 percent of the transaction amount, significantly lower than the 1.13 percent for debit cards and 2.34 percent for credit cards.

# Pix Ecosystem




* Interface with open finance, incorporated in the Pix ecosystem in Oct, 2021

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# How Pix was able to gather so much impact in Brazil?


Pix has seen swift adoption since its inception. Both the number of transactions and the financial volume have shown progressive growth. As of December 2022, including transactions within and outside the Instant Payment System (SPI), there were 2.9 billion Pix transactions, a staggering 1900% growth from December 2020, the second month of Pix operation. This illustrates its widespread acceptance in Brazilian society and business circles. The transaction volume increased 914% in 24 months, hitting R$1.2 trillion in December 2022.

From Pix's launch until December 2022, nearly 61% of all transactions were less than R$100, indicating that Pix is primarily used for lower-value transfers. Looking at transactions from individual payers, 93.1% of these transactions are below R$200, reinforcing the small-value nature of these transactions. For transactions between private corporate entities, while there is a concentration of R$500, a significant number of larger-value transactions are noticeable: 18.6% of transactions start from R$2000.

Pix is predominantly used in individual transactions (P2P), with corporate entities transacting larger financial volumes. Initially, most transactions were expected to be P2P, with 87% of transactions in November 2020. Corporate adoption of Pix tends to be slower, primarily due to required system adaptations. However, a gradual increase in transactions from individuals to companies (P2B) has been noted since Pix's launch until the end of 2022, from 5% in November 2020 to 24% in December 2022. Considering only the transactions in December 2022, the average value of transactions between corporate entities (B2B) was R$5.7k, significantly higher than the average value of P2P transactions, which was R$257. This reflects the predominantly commercial nature of B2B transactions, which tend to have higher individual values. This is seen in the high representation of B2B in the total liquidated value, which was 36% in December 2022. Most transactions were of lower values, with a handful of relatively high-value transactions. Transactions involving the government represented only 0.1% of the total quantity and 0.7% of the total financial volume in December 2022, indicating the potential for Pix to grow in governmental transactions.[4]

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# How to improve Pix penetration in B2B payments?

Since its launch in November 2020, Pix has revolutionized the payment landscape in Brazil, offering a fast and convenient alternative to traditional transactions. In three years, the system has amassed an impressive 155.8 million users, of which 144.8 million were individuals and 13.4 million were corporations.

The volume transacted in 2023 exceeded R$15.3 trillion, which demonstrates the rapid acceptance and widespread adoption of this payment solution. From the launch of Pix until the end of 2022, transactions from individuals to companies increased from 5% in November 2020 to 34% in October 2023, according to data from the Central Bank.

Although Pix has gained considerable traction in transactions between individuals, its penetration in B2B (business-to-business) payments occurs at another pace and still faces some challenges.

This is partly due to the predominance of traditional payment methods, such as boleto and bank transfers, and concerns about security and control in commercial transactions. Therefore, it is important to develop and implement solutions offering advanced authentication and tracking mechanisms to alleviate these concerns. Allowing businesses to set transaction limits, approve payments in stages, and monitor transactions in real-time can increase confidence in using Pix for B2B payments.

For the receivers, mainly companies and governmental entities, the challenge is still generating batch charges efficiently and adapting the internal systems of the charge issuers to automate processes. Pix provides the ease of system integration, but the process requires technological development on the part of companies offering commercial automation solutions and business management (like ERPs and POS systems).

Initiating payments is an important initiative in democratizing Pix as a form of B2B payment, facilitating the integration with billing systems without needing an internal banking structure. However, in B2B, the regulatory agenda still needs to start incorporating the approval of batch payments so that this modality becomes popular within ERPs.

Another essential approach to increasing the penetration of Pix in B2B payments is education and awareness. Companies need to understand the benefits of Pix, such as its speed of transactions, 24/7 availability, and cost reductions associated with traditional methods.

It is certain that as more companies recognize Pix's efficiency and economic benefits, the transition to B2B payments via Pix will become a more concrete reality and will undoubtedly boost the digital transformation of the Brazilian business environment.

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# What are the next steps for Pix?

The existing Pix products will continue to be refined, while new functions and products will be introduced in the next few years. The aim is to ensure Pix's constant and sustainable evolution to better cater to the payment needs of individuals, businesses, and government entities. This evolutionary development aims to broaden the range of use cases Pix can accommodate, further boosting its usage. Pix was designed to enable any transaction or payment currently made in Brazil to be carried out through it. The following section outlines the products and features slated for development in 2023 and beyond. **These include:**

## Pix Automático

This feature allows for automatic recurring payments with prior authorization from the payer, eliminating the need for individual transaction authentication each month. It provides ease for recurring payments and minimizes the risk of missed payments, thus avoiding penalties and interest for late payments. It enables customers with accounts in any Pix participating institution to set up recurring payments to be cleared automatically, eliminating the need to establish bilateral collection agreements with each institution. Pix Automático is developed with high flexibility, aiming to have a lower cost than current solutions. Although the specifications and development of this new product are scheduled to take place throughout 2023, it is estimated that its launch will occur in 2024.

## Secondary Channel for Non-Priority Transactions

The BCB is developing a specific channel for processing non-priority payments, known as the secondary message transmission channel. This channel is anticipated to commence operations in October 2023. Introducing "Pix Programado" allows the paying institution to retain payment orders in their systems until the scheduled date. Sending these transactions to the Central Bank could result in the accumulation of large payment batches at the same time, potentially overloading the processing system. To streamline payment processing where instant availability of funds in the recipient's account is not essential, such as scheduled payments, and to avoid competition with payments that genuinely need to be settled in seconds, this secondary channel for non-priority transactions is being created.

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# What are the next steps for Pix?

## Security Improvements

The BCB continuously works to improve the security of the Pix instant payment system, involving multiple external agents. In 2023, enhancements are expected regarding security information related to Pix keys, stored by the BCB and shared with all participants. New fields will be created to enable institutions to document fraudulent transactions better. Furthermore, the information provided during key or user consultations for security purposes will be reformulated to display more relevant information over a longer period. These enhancements aim to provide better support to institutions in preventing fraud.

## Pix Internacional

It aims to enable cross-border payments with currency conversion. The authorities are considering integrating Pix with instant payment schemes of other jurisdictions, including the BIS Nexus system. However, the BCB has yet to schedule a scheduled timeframe for its release.

According to the BCB, the Pix payment system promotes multiple public objectives, fostering a competitive environment, network effects, technical cooperation among market players, and economies of scale.

Despite Pix's innovative nature and established use as a tool for inter-account transfers, there are still challenges to be overcome to realize its full potential and meet all payment needs. Part of these challenges relates to the payment habits of users accustomed to other payment instruments. Changing habits requires time and educational efforts by the BCB and participants, new Pix use dynamics development, and correcting inefficient incentives.

For payees, like businesses and government entities, the challenges include efficiently generating batch payments and adapting internal systems for payment automation. Although Pix offers easy system integration, this process requires technological development by commercial automation and enterprise management solution companies.

Similarly, payments at both physical and electronic points of sale involve technological development and integration efforts by businesses, which also require adaptation time.[5]

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# Other Real-Time Payment Developments in Latin America

## Mexico

A year before Pix's official launch, the Mexican Central Bank onboarded a new real-time payments solution called Cobro Digital (CoDi).

CoDi, launched in 2019, aims to facilitate financial transactions and promote inclusion. However, its adoption has been slow, with only seven million registered users out of a population of 130 million in Mexico. Additionally, only 840,088 accounts have reported at least one transaction[6]. In contrast, Brazil had widespread use of electronic money before Pix, with higher credit and debit card penetration rates and a larger number of banked adults.

CoDi and Pix differ in terms of openness. CoDi restricts participation to financial institutions that are members of SPEI, the Bank of Mexico's real-time gross settlement system. However, it allows third-party development of payment request applications. On the other hand, Pix allows three types of institutions. The first type is payment initiation providers, which carry out payment initiation at the customer's request but do not participate in the financial settlement. The second type is transaction account providers, which offer accounts to final users and can participate directly or indirectly in the settlement infrastructure. The third type is special intermediaries, which connect indirect members of Pix to the central bank's settlement infrastructure without offering transactional accounts to end users. This crucial difference impacted how financial institutions could integrate a real-time consumer payment solution. For example, with 13,959,085 validated accounts on CoDi, 61% were created through BBVA, 17% through Bancopel, 12% through Citibanamex, and 11% through other institutions, excluding the opportunity for the use of CoDi by purely digital and innovative financial solutions.[7]

Due to that, the Bank of Mexico decided to implement a new real-time payment solution, aiming to fix issues related to the distribution of its payments system, called Dinero Móvil (DiMo). With this new method, launched in June 2023, it's no longer necessary to have the CLABE account or the account number of the person to whom it will be transferred; you will only need the cell phone number. Also, the Bank of Mexico is improving its infrastructure and integrations, aiming to strengthen its connections with fintechs, creating a relevant tailwind for consumer adoption and reducing cash dependency in the Mexican Economy.

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# Other Real-Time Payment Developments in Latin America

## Colombia

Colombia took a different approach to real-time payments through private cooperation between a clearing house and a fintech. In 2020, they launched Transfiya, a real-time payments solution built by Minka, a Bogota-based fintech, and ACH Colombia, a company responsible for bank-to-bank operations in the country.

Transfiya operates 24/7, providing up to four free transfers of up to COP 250,000 (around $65) daily to recipients' mobile phone numbers. In one year, Transfiya reached 1.7 million transactions and 450,000 active users, reaching almost 17 million for only the first quarter of 2023.

Although the solution is gaining space in the Colombian ecosystem, it has growing challenges compared to PIX. In Colombia, the local clearing house is operated privately; in Brazil, it is operated by the Central Bank. ACH Colombia is an association of all banks in Colombia. Colombia's Central Bank handles high-value payments, while low-level payments are handled by ACH Colombia. Therefore, there are still major questions on how the solution can be expanded locally across all facets of the economy since not all financial institutions have widely adopted the platform. Several new developments were made to improve on its current solutions, such as a new resolution being issued in October 2023 by the Colombian Central Bank regarding the interoperability in immediate low-value payment systems, which will improve the connectivity between banks, fintechs, and other institutions in Colombia.(8)

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# Other Real-Time Payment Developments in Latin America

## Argentina

Launched one month after Pix, "Transferências 3.0" aims to improve financial accessibility for Argentinians. However, it didn't have the same impact. The Central Bank of Argentina (BCRA) has attempted to modernize its payment system by making it faster since 2016. However, with Transfer 3.0, the country began to adopt technical standards based on global standards such as ISO 20022, allowing for new use cases and bringing Transfer 3.0 to an interoperability level comparable to Pix in Brazil. Also, all transactions are done through QR Codes, centralizing its infrastructure and technology on the BCRA. [9]

To promote the use of micro, small, and medium-sized enterprises (MSMEs) in the country, the BCRA has waived usage fees for the first three months for the first 50,000 pesos traded per month. After this period, the commission is capped at 8,000 monthly pesos (approximately 84.25 US dollars).

However, there are several issues regarding the use of QR Codes on digital wallets and a significantly worse economic environment, with the currency experiencing high inflation during the launch and expansion of Transferências 3.0.

Nevertheless, the solution is expected to gain traction, as there has been considerable growth in the use of mobile banking platforms, increasing by 90% from 2016 to 2021, according to the BCRA.

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# Other Real-Time Payment Developments in Latin America

## Peru

Since 2016, Peru has had its real-time payment solution called Immediate Interbank Transfers (IIT). It has been successful, with good volume growth, averaging 35% yearly growth. By January 2020, IIT processed an average of 580,000 transactions per month. However, the country wanted to expand its service by providing 24/7 with a much larger number of daily transactions since most of the population is still unbanked.

Therefore, in September 2020, CCE, Peru's clearing house, announced a strategic partnership with Mastercard to create a new real-time payments solution, taking into account the global standards of speed, cost, and interoperability (ISO 20022). This new solution has propelled the country's financial innovation discussions, bringing together fintechs and traditional financial institutions.

## Chile

In Chile, a payment system called Transferencias en línea (TEF) was implemented in 2008. However, the country's payments sector is continuously evolving. The regulatory framework for card issuers has been modified to allow more participants to access the payment system, and the Central Bank of Chile (BCCh) has formed a Working Group to explore and propose a strategy for digital payments in the medium and long term.

The BCCh established a working group (WG) to explore and propose a medium — to long-term strategy for digital payments in Chile. The WG has focused on the internal discussion of retail central bank digital currency (CBDC) and aims to determine whether there is a compelling reason for future issuance of CBDC in Chile.[10]

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# Open Finance Adoption and Growth

Sharing data about a user's financial information aims to improve competitiveness in the financial sector. In this section, we'll see how regulation paved the way for a new market and fostered new startups.

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# What is the Brazilian version of open finance?

The term open finance emerged in Brazil in March 2022 as an evolution of open banking, an open banking system that establishes standardized sharing of personal banking data between financial institutions with the aim of improving the offering of personalized financial products and services and enhancing the user experience, making it more transparent and frictionless.

In the European Union, the first regulations regarding open banking were introduced in 2015, followed by the General Data Protection Regulation (GDPR), which provides guidelines on privacy and protection of personal data, companies' handling of it, and responsibilities. In Brazil, a similar law, the General Data Protection Law (LGPD), was enacted in 2018.

Since its inception in Brazil, the implementation project of open banking has been closely linked to a broader innovation process led by the Central Bank of Brazil and supported by the guidelines of its strategic agenda, the BC# Agenda. This innovation aims to digitize the economy, reduce information and market asymmetries, increase competitiveness, and include the Brazilian population in accessing financial services and products. It encompasses creating an instant payment system (Pix), launched in 2020, and standardizing banking and financial information (open finance). It culminates in making the Brazilian digital currency (CBDC), enabling intelligent payments and greater efficiency in the national financial system (SFN).

The design of open banking started in 2020 and evolved through four stages, including the move towards open finance. Open finance goes beyond banking data to include investment products, insurance, foreign exchange, and retirement plans. It aligns with a broader concept of "open data."

## The original phases of Brazilian open finance are:

- **Feb-21** Standardized sharing of information from participating financial institutions with the public
- **Aug-21** Sharing of customer registration and transactional data with consent
- **Sep-22** Initiation of payment transactions
- **Apr-23** Sharing of data and information on investment products, insurance, foreign exchange, retirement plans, and other related products

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# What is the Brazilian version of open finance?

In addition, other structural differences exist in how open finance is approached in Brazil compared to other initiatives worldwide. For example, only institutions authorized by the Central Bank can be direct participants in open finance (sending and receiving data from financial institutions). Large banks classified as S1 and S2 had mandatory participation since phase 1. In contrast, medium and small banks (S3 to S5), Payment Institutions (IPs), Payment Initiation Service Providers (PISPs), and authorized fintechs could have voluntary participation from phase 3.

Unauthorized agents, such as Account Information Service Providers (AISPs), a common and regulated figure in the UK's open banking, and data fintechs and techfins, for example, do not have regulated participation in Brazilian open finance and depend on the intermediation of a direct participant who is subject to specific rules for data management, security, and accountability. This has been criticized for some time as it became a bottleneck and limited certain business models, such as those that offered data aggregation, enrichment, and analysis services from open finance, which had to resort to less standardized and resilient mechanisms like web scraping. On the other hand, alternatives arising from Pix, such as the Payment Initiation Service Provider (PISP), a type of Payment Institution with more lenient authorization rules and a more specific scope of operation, brought significant gains to the sector and allowed fintechs to provide an even smoother experience for Pix users, who could initiate payments through their favorite application.

Open finance faces new technical and business challenges today, proving that the journey toward real data integration focused on usability will be extended. It will involve not only education and awareness of customers about their data but also the cleaning and quality management of the data shared in open finance APIs (as the systems principle states, "garbage in, garbage out") and a mindset shift for financial institutions, fintechs, and related entities, who still need to learn to collaborate better and develop more personalized business models and products, offered with more certainty and at the right time, with the customer journey at the center.

Nevertheless, Brazil seems to have succeeded in adopting the model for open finance, learning from good practices and global experiences while embracing and adapting to local needs, peculiarities, and proportions. It is more than a disconnected innovation action pressured by the regulator; it is a comprehensive, interconnected, and strategic initiative that has already reached 28.3 million consents and more than 800 participating institutions in its two years of existence and promises to revolutionize the way people and businesses interact with their financial lives — for the better.

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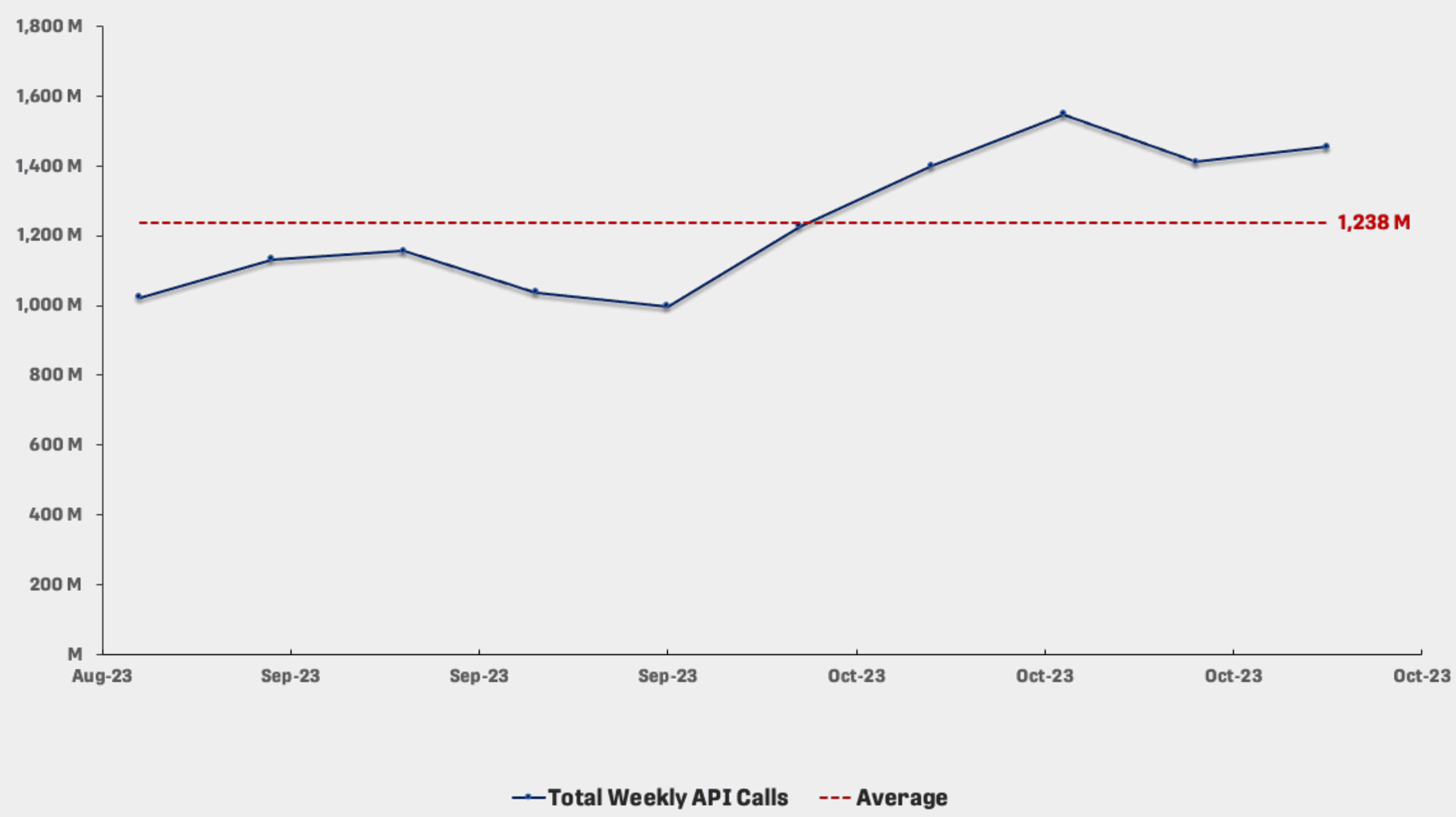
# Adoption and Growth of Open Finance in Brazil

Open banking in Brazil has evolved and is now known as open finance, an open financial system through digital solutions involving various organizations in the financial ecosystem. Despite significant progress in the last five years, the project still faces challenges. The general population has not yet widely understood and adopted the idea of sharing financial data to obtain better financial products and personalized solutions.

Currently, some financial operations can be performed without opening the financial institution's application. According to data from the Governance Framework of Open Finance in Brazil, the total number of API calls (messages requesting a service) surpassed 1 billion on April 14, 2023. **On average, 1.3 billion API calls are made weekly through the open finance API.**

## Weekly Open Finance API Calls



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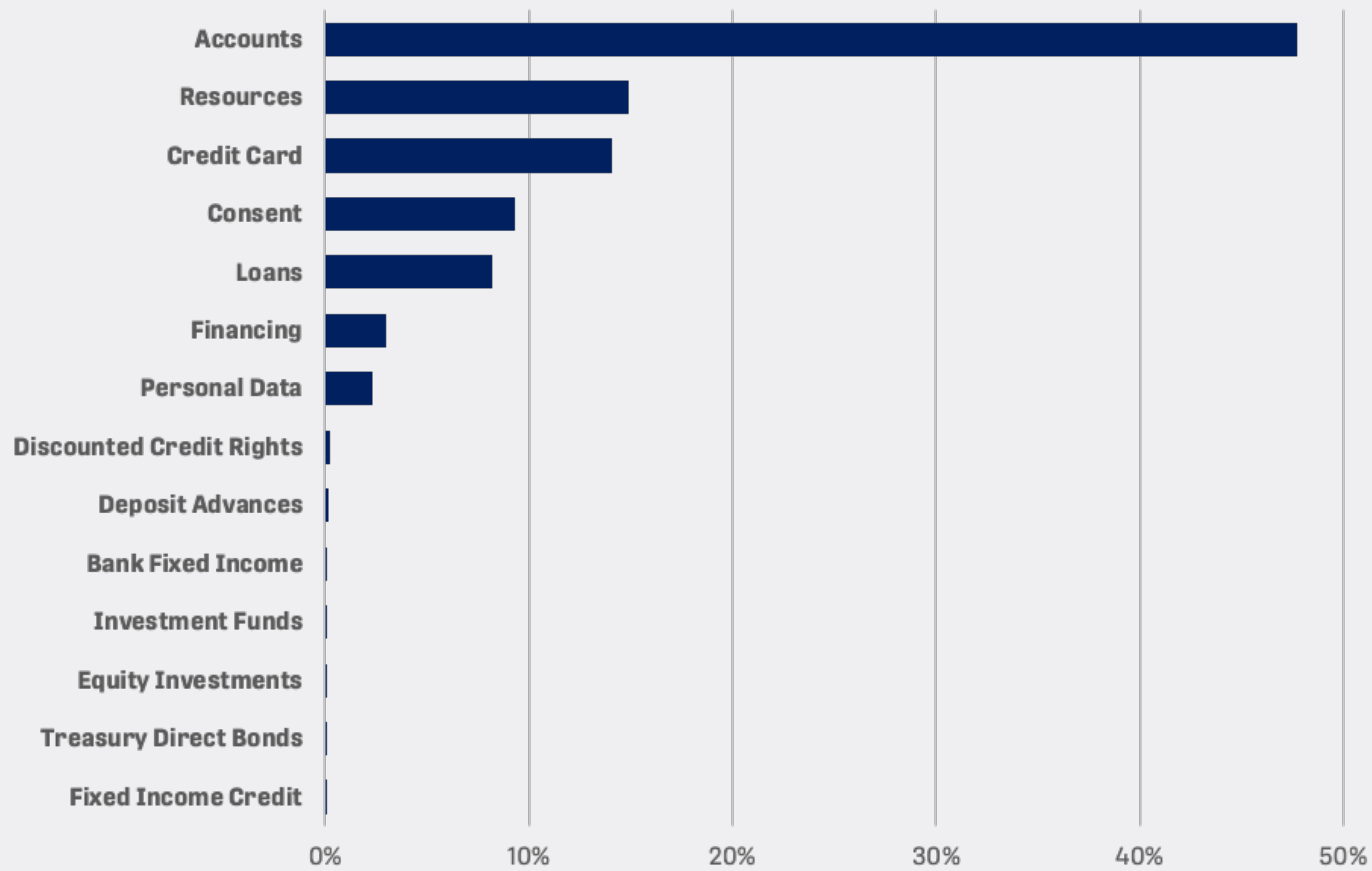
# Adoption and Growth of Open Finance in Brazil

## Distribution of Open Finance's API Calls




The table shows the distribution of API calls in open finance. In Brazil's open finance, most API calls are related to accounts, accounting for 48% of the total calls. Credit card-related API calls make up 14%, followed by resources at 15% and loans at 8%. Other types of API calls include personal data (2%), financing (3%), consent (9%), and various types of investments (ranging from 0% to less than 1%).

**The majority still being used to connect with accounts and credit cards takes into account the main implementations being made with open finance. For example, Banco do Brasil helped users manage their expenses through PFM Software that connected all of their bank accounts, and Nubank connected with all users' bank accounts to improve its credit-card risk model and add a larger credit line for certain users.**

Based on the distribution of API calls, it can be inferred that there is significant interest in accessing and managing account-related information in Brazil's open finance. Credit cards, resources, and loans are also areas of focus.

However, the low usage of API calls shows that there is still a lack of implementation of the user's investments, which shows that significant institutions have not yet understood the potential of connecting all of their users' investments across different financial institutions.

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# Adoption and Growth of Open Finance in Brazil

However, open finance still needs to face challenges to truly become a single source of truth for the Brazilian financial system. One challenge is sustaining and keeping up with constantly changing regulatory requirements. New features, updates, and fixes are regularly introduced, necessitating adaptation and implementation by financial institutions.

Additionally, involving financial institutions' business areas in the open finance process is crucial. Initially, the focus was on building the infrastructure, but now, there is a need to strategically think about leveraging shared data to create new products and generate revenue. Financial institutions must reconsider their internal processes and explore the opportunities data sharing presents to drive growth and innovation.

Regarding future challenges, according to Murilo Rabusky, CCO and Co-founder of Lina, the implementation process of open finance can be compared to that of the Brazilian Payment System (SPB) and Pix. He mentioned that the SPB took over 20 years to stabilize, and Pix, launched in 2017 or 2018, is still undergoing updates and corrections. Open finance is even more complex, involving many financial institutions and covering different areas such as insurance, investments, and foreign exchange operations. Therefore, financial institutions still have much work ahead of time to adapt to the new functionalities and scopes of data sharing.

According to Bruno Loiola, Co-Founder and COO at Pluggy, another potential issue is the lack of detailed transaction descriptions, which hinders data comprehension. To provide tangible benefits to end users, it is important to develop specific use cases for this information.

It was noted that many of these use cases are being developed by non-financial companies, which already utilize this data to improve operational efficiency. Payment initiation was identified as a key aspect of open finance, and the upcoming phase of this functionality promises to revolutionize payments with features like batch payments, variable recurring payments, and faster, cheaper bill payments for businesses.

Non-redirection during transactions is also highly significant, indicating that users do not necessarily have to be redirected to other websites or platforms. The Central Bank is prioritizing this approach.

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# How can open finance penetration grow?

We have often considered open finance a product or financial arrangement. An example is the Brazilian Pix, which is recognized worldwide, especially in the Latin American region. It is expected to hear about Pix as a product pursued by those who desire instant payment systems. However, Pix is a unique arrangement, meaning it implements the transfer of financial resources between accounts and nothing more.

Perhaps this is the substantial difference between Pix and open finance. At the end of the day, the open finance model is the creation of access rails to the financial universe in a different way than we are accustomed to. Therefore, opening the financial market means going far beyond an arrangement or a method, but the possibility of completely changing how we relate to these products.

A broader view of this is that in Brazil, the open finance system includes data such as checking accounts, investments, credit cards, credit products, life insurance, and various other insurance products. We are talking about more than 500 mapped data fields in these cases.

The open finance ecosystem also includes payment arrangements, which are basically a simplified method similar to Pix, known worldwide as payment initiation. In addition to payments, Brazil is expected to include a category called credit proposal, which is essentially a simplified way to offer credit or even offer credit portability (when a financial institution offers a more attractive interest rate to the borrower).

Given this introduction to open finance, it is necessary to reflect on the time it will take for the entire market to adopt the models proposed by this ecosystem more widely. In general terms, it is difficult to believe that the term “open finance” or “open banking” will become as popular as the famous Brazilian expression: “Me faz um Pix” (which translates to “Make a Pix payment for me”).

In this new financial universe, incumbents, neo-banks, fintechs, insurtechs, and new entrants must undergo a maturation period. This period is progressing, and some positive signs are already in place.

One sign of maturation is the emergence of offers for account aggregation, allowing customers to manage their entire financial lives through a single app. This happens because the customer provides this specific entity with consent to access their data in other banks, making consolidating transactions, balances, and even contracted products possible.

On an even larger scale, we can also include insurance products here. Imagine that in the near future, both insurance companies and banks will have access to customer information, whether related to insurance or finance and can, therefore, create personalized proposals for them.

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# How can open finance penetration grow?

This future of personalization is not so far off. One of Brazil's leading independent insurance companies has been connecting with neo-banks to distribute life insurance products. These banks are using open finance data to learn more about propensity and the best format to offer insurance, resulting in offers that are closer to their reality.

However, this data universe is continually explored and matures at a reasonable pace. Still, payments via open finance have seen a steeper maturity curve, bringing exciting models to the market.

The most significant evolution in this universe is the possibility of payment without the experience of redirection. Practically, it's as if you preauthorize a company to pay on your behalf through a single authentication. This experience is very similar to a debit card, where you use a card and a PIN to initiate an immediate payment at any point of sale and an instantaneous transaction.

In this format, Payment initiation, an exclusive arrangement of open finance, should have massive market penetration, as it is the only means of withdrawing financial resources from one account and bank to another.

This possibility opens up various market paths, but for this to happen, more mature implementations are needed, not only for the payment instrument but also for all the reconciliation, management, and control mechanisms in the environment.

Moving beyond Brazil, in Latin America, we can observe the rapid evolution of open finance ecosystems, with notable progress in Chile, Colombia, and Mexico. Colombia, for example, includes open data in its regulatory roadmap, an evolution of finance that includes data from other markets such as energy, water supplies, and telecommunications.

With all this, we can analyze that this new frontier of open finance is more than just a new payment or data acquisition method; it is an entirely different way of building financial solutions. Furthermore, it will herald a new era of data and people's relationships with market companies.

Finally, in the regulators' view, opening these ecosystems is an irreversible path. Promoting competitiveness and convenience and focusing on consumer well-being is a priority. Therefore, as a new era dawns, companies will undoubtedly adapt.

Indeed, the greatest challenge for the future of open finance, as well as other ecosystems, is and will always be interoperability, meaning how we will enable companies from different niches, cultures, technological stages, and management to communicate with each other through the same protocol, all with a focus on the end customer. To achieve this, we must continue evolving and building solid bridges that help all involved parties get there.

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# Open Banking/Finance Expansion in Other Countries in Latin America

## Mexico

Mexico was the first country in Latin America to regulate financial data sharing through APIs. In 2018, Mexico passed its fintech law with support from the IDB, aiming to foster the growth of innovative financial technology enterprises. Article 76 of the law mandated the establishment of APIs for interconnectivity between financial institutions, money transmitters, credit information companies, clearing houses, regulated fintech companies, and companies authorized to operate with new models. In 2020, Mexico published comprehensive rules establishing technical and security requirements for APIs.

**The implementation of open finance in Mexico is divided into four phases:**

- The exchange of public data through APIs.
- The standardization of aggregated data.
- The standardization of the exchange of transactional data.
- The regulation of other types of data.
    - While the deadlines for each phase are uncertain, all phases are expected to be completed by 2023.

Access to financial institutions' APIs requires prior authorization from the CNBV, and participants must comply with the regulator's technical and safety standards. The collected data can only be utilized with the consent of financial consumers, and institutions that do not follow data exchange rules or pose a threat to data security may be denied access to the information.

Mexico's implementation of open finance addresses privacy protection and the fundamental right to privacy regarding users' financial information. The Mexican Constitution recognizes the right to privacy as a fundamental right, and the country has a data protection authority, INAI, responsible for regulating and executing data protection laws, regulations, and guidelines.

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# Open Banking/Finance Expansion in Other Countries in Latin America

Overall, the process for open finance regulation and implementation in Mexico involves establishing APIs, technical and security requirements, phased implementation, and consideration of privacy protection and rights.

These regulations have catalyzed the growth of innovative financial technologies, offering new opportunities for fintech startups and traditional financial institutions. Open finance can reach underserved populations by facilitating easier data sharing and service integration, increasing financial inclusion. **Some of the trailblazing fintech startups include:**

**Clip** is a Mexican fintech startup that offers a mobile credit card reader. This reader enables small businesses to accept card payments easily. Clip leverages open banking by integrating various banking services and payment systems, providing a seamless transaction experience for businesses and customers.

**Konfío** is an online lending platform focused on Mexico's small and medium-sized enterprises (SMEs). By using open banking APIs, Konfío can access real-time financial data from its clients, enabling quicker and more accurate credit assessments and personalized lending solutions.

**Cuenca** is a neobank offering online financial services, including debit cards, money transfers, and bill payments. As a neobank, Cuenca integrates services from various financial institutions using open banking APIs, providing customers with a comprehensive and user-friendly banking experience.

**Flink** is a digital banking and investment platform that allows users to invest in the stock market with small amounts of money. Flink uses open banking to offer integrated financial services, including bank account aggregation and investment options, enhancing users' ability to manage and grow their finances.

**Albo** is a digital bank that offers a range of services, including personal accounts, international transfers, and budgeting tools. Albo utilizes open banking principles to provide a more integrated financial experience, allowing users to manage multiple financial products through a single platform.

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# Open Banking/Finance Expansion in Other Countries in Latin America

## Colombia

Colombia has made progress in establishing an open finance framework. Decree 1,297 of 2022, published by the Superintendencia Financiera de Colombia (SFC), outlines the requirements for a voluntary framework for open finance and sets standards for consumer data exchange.

The SFC oversees financial regulation and market systems to ensure stability and security. The decree also regulates payment initiation services and emphasizes consolidating financial security and stability, expanding access to the payment system, and strengthening institutions. Before establishing the framework, some open finance platforms were already active in Colombia. Laws such as the "Habeas Data" Law of 2012 and the "Habeas Data Financiers" Law of 2008 gave individuals the power to decide with whom they share their information.

Open platforms may request authorization from consumers and companies to share data with third parties. The SFC has also instructed supervised entities to adopt the latest standards for monetary operations using QR codes, aiming to standardize information in the payments ecosystem. Major banks in Colombia, such as Davivienda, are increasingly adopting digital solutions and are open to collaborating with fintech companies. This shift towards digital banking indirectly supports open banking principles, as it involves sharing data and integrating services with third parties.

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# Open Banking/Finance Expansion in Other Countries in Latin America

Colombia has also shown interest in adopting regulatory sandboxes. These allow fintechs to test new technologies and business models in a controlled environment under the regulator's supervision, potentially paving the way for more open banking solutions. One of the biggest opportunities in Colombia is leveraging open banking to increase financial inclusion, especially among rural and low-income populations. **Some of the fintechs in Colombia that are innovating at the intersection of financial services and open banking include:**

**TPaga** is a mobile wallet and payment platform designed to provide financial services to Colombia's unbanked and underbanked population.TPaga leverages open banking principles by integrating various financial services, including payments, transfers, and bill payments, into a single platform, making financial services more accessible.

**DaviPlata** is a mobile financial service platform developed by Davivienda, a prominent Colombian bank. It aims to simplify financial transactions for users by integrating various financial tools and allowing users to manage their finances through a single app. DaviPlata embodies the essence of open banking, enhancing user experience and financial management.

**Movii** is a digital wallet and financial services platform offering various services, including money transfers, bill payments, and mobile recharges. Movii utilizes open banking as a digital wallet by aggregating multiple financial services and data, providing its users with a more holistic financial management tool.

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# Open Banking/Finance Expansion in Other Countries in Latin America

## Argentina

Argentina has been taking steps toward open banking, with the country's central bank implementing new regulations and initiatives to encourage digital payments and promote interoperability. In May 2022, The Central Bank of Argentina (BCRA) adopted measures to regulate virtual wallets, requiring financial institutions and payment service providers to enable consumers to link other accounts, promoting convenience and accessibility in digital payments.

The BRCA's initiatives have encouraged digital payments and facilitated interoperability among financial institutions. By requiring banks and payment service providers to enable consumers to link their accounts with other entities, the BCRA has laid the groundwork for a more integrated and accessible financial system. The regulations by BCRA have a dual aim: to streamline digital transactions and to ensure robust security and transparency. The focus is not just on creating a system that is technologically advanced but also user-friendly and accessible to a broader section of the population. This is particularly significant in a country like Argentina, where a considerable portion of the population remains unbanked or underbanked.

Although there is no specific open finance regulation in Argentina, some market incumbents have taken the initiative to establish the foundation for an open finance ecosystem. For example:

BIND, an industrial bank, partnered with Poincenot Technology Studio to design, build, and deploy a Banking-as-a-Service (BaaS) model. This allows fintechs and traditional companies to access financial data and products efficiently using open APIs. Through these APIs, companies can integrate their legacy systems with the bank systems to facilitate payments, collections, investments, reconciliations, and more.

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# Open Banking/Finance Expansion in Other Countries in Latin America

In Argentina, it's essential to focus on companies that have embraced the opportunities created by the evolving financial landscape, leveraging the principles of open banking to innovate and offer new services:

**Ualá** is a prominent Argentinian fintech startup that offers a personal finance management app. It links with users' bank accounts and provides services like tracking expenses, making payments, and managing savings. By integrating with users' bank accounts, Ualá exemplifies open banking principles by offering a comprehensive view of finances and facilitating seamless financial management.

**Rebanking** is a digital banking platform offering various services, including digital accounts, savings options, and investment products. Rebanking uses open banking frameworks to provide a more integrated and user-centric banking experience, allowing customers to manage various financial products in one place.

**Brubank** is an online bank in Argentina that offers digital banking solutions without physical branches. By utilizing open APIs, Brubank allows easy integration with other financial applications and services, embodying the open banking ethos of interoperability and user empowerment.

**Wilobank** is Argentina's first fully digital bank, offering services entirely online. Embracing open banking, Wilobank provides a seamless digital experience with features like online account opening, digital wallets, and comprehensive financial management tools.

From personal finance management apps like Ualá to fully digital banks like Wilobank, these companies are at the forefront of leveraging open APIs and the ethos of open banking to deliver more inclusive, efficient, and user-friendly financial services in Argentina. These initiatives, created by the Central Bank of Argentina, demonstrate the Argentine interest in implementing open banking in the country and its potential to enhance financial services and promote innovation.

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# Open Banking/Finance Expansion in Other Countries in Latin America

## Chile

Chile's fintech law, Law 21.512, was enacted in January 2023. It established a regulatory framework for fintech technologies and created an open banking system in Chile. This system allowed for the exchange of customer information between different financial or related service providers.

The first step towards implementing this open banking framework in Chile was the Financial Portability Law, signed in 2020, simplifying the transfer of individuals and businesses between service providers for financial services. In 2021, the Interchange Rates Law was enacted to regulate payment card interchange fees and increase market competition. Transparency requirements and responsibilities of market agents were reinforced by law in the same year, enhancing competition and consumer protection.

The Ministry of Finance commissioned research to develop an open finance framework in Chile, and a study suggested collaboration between banks and fintech. Over 54% of Chilean fintech startups have integrated open finance and API technologies into their operations, indicating a broad adoption of open banking practices since these new laws were passed.

The implementation of open banking in Chile is poised to revolutionize how individuals and businesses interact with financial services providers. By leveraging technologies like APIs, open banking opens new opportunities for startups, fintech, and tech companies to disrupt traditional finance models and contribute to financial inclusivity.

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# Open Banking/Finance Expansion in Other Countries in Latin America

Although not as well-established as those open-banking initiatives in countries like Argentina or Colombia, **there are already a plethora of Chilean startups beginning to take advantage of some of the initiatives:**

**Faaro** is a Chilean fintech startup that provides tailored and flexible financial solutions. It is beginning to utilize open banking to offer personalized financial products and services. By accessing customer data through open APIs, Faaro tailors its offerings to meet each user's unique needs and preferences. Through open banking, Faaro gathers and analyzes financial data from various sources, enabling it to offer more informed financial advice and predictive analytics to its customers.

**Hackmetrix** focuses on cybersecurity within the fintech sector. Open banking APIs require robust security protocols, and Hackmetrix provides solutions ensuring the safety and privacy of financial data exchanged between institutions and users. They also offer services to help other fintech companies comply with the regulatory requirements of open banking, including risk assessment and management tools. Hackmetrix is involved in developing or consulting on integrating APIs, a fundamental aspect of open banking, ensuring smooth interoperability between different financial systems.

**Levannta** uses open banking to create new financial products that offer greater flexibility and customization, harnessing the power of shared financial data. Being at the forefront of fintech innovation, Levannta collaborates with banks and other financial institutions to develop open banking solutions that benefit both businesses and consumers. By embracing open banking, Levannta can expand its market reach and attract a broader customer base by offering more accessible and diverse financial services.

# Verticalization of Fintechs

In this section, we'll explore the transformative trend of fintech verticalization. This innovative approach acknowledges the unique financial needs of various customer segments and tailors solutions accordingly, unlocking the potential for growth and innovation.

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# What is *"verticalization"*?

The verticalization of fintechs is a transformative trend that addresses the inherent complexities and challenges in selling and shopping for financial products. It recognizes the limitations of the historical one-size-fits-all approach, primarily driven by the high costs associated with building, acquiring, and serving financial products.

Traditional incumbents and early fintechs used to offer the same product to a large company as they would to a small startup or an SMB, regardless of their different needs and characteristics. However, this approach fails to acknowledge various customer segments' unique requirements and nuances. Whether it's an e-commerce company, hospital, or any other industry, each segment has its own specific necessities and operational intricacies. The increasing availability of technology has played a pivotal role in disrupting the traditional financial landscape, which left behind more complex verticals and lagging in product offerings.

Fortunately, these overlooked verticals represent untapped potential for software-enabled productivity enhancements, revenue growth, and cost reduction. By leveraging technology and tailoring financial solutions to suit the distinct demands of each vertical, fintech companies can unlock individually addressable markets that are ripe for innovation. This shift toward verticalization enables fintechs to develop specialized offerings that are finely tuned to specific industries' unique characteristics and requirements.

While the growth of financial services has undoubtedly benefited many companies in the Fintech sector, it has also resulted in the commoditization of certain aspects, such as embedded payments — the widespread availability of payment solutions as API calls have narrowed margins and limited scope for innovation. To break free from this commoditization trap and push the boundaries of financial innovation, Fintech started developing B2B payment solutions that truly own their verticals.

Due to that, fintechs are able to create better moats for their business models. Customers will be able to take advantage of specific products tailored to their necessities, such as hedging products for farmers and receivables for trade finance, among others. This playbook came directly from the same trend observed by pure SaaS startups over the last 7–8 years. Therefore, industries that have been disregarded for many years are now being offered a solution that addresses their particular challenges instead of a generic approach that fits all.

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# What industries are benefiting from this trend?

By profoundly understanding specific industries' needs and pain points, fintech companies can design tailored payment solutions that cater to the unique challenges businesses face in those verticals. This approach goes beyond mere transactions and offers genuine financial innovation that drives value for both the fintech companies and their industry-specific customers. Through vertical specialization, fintechs can create lasting differentiation, foster meaningful partnerships, and deliver impactful solutions that empower businesses to thrive in their respective sectors.

## Agribusiness

**Creditares** is a fintech that combines its local presence with a tech infrastructure to bridge the gap between investors and borrowers in agribusiness. This combination provides the answer to the industry's most challenging question. Creditares is connecting locally with farmers and suppliers, digitizing their credit journey, and gathering reliable information for financial agents.

**Nagro** is a fintech platform that addresses the credit dependency in Brazilian agribusiness by connecting farmers to suitable credit sources. The platform collects information about farmers' profiles, activities, and ecosystems and uses machine learning and data analysis to match them with appropriate credit sources. This process simplifies and speeds up the agribusiness credit process, offering farmers an alternative to bureaucratic government credit.

## Healthcare

**Dr. Cash** is a fintech that provides credit for medical, dental, and aesthetic treatments. Operating on a B2B2C model, the company partners with clinics, offering their clients Dr. Cash as a payment option. They have registered over 4,000 clinics. Their competitive advantage is that they provide financing to the customer and upfront payment to the clinic, improving cash flow. The benefits of using Dr. Cash for the end customer include not compromising their credit card limit, extending installments, and paying lower interest rates.

**Fin-X** is a startup dedicated to making healthcare more efficient. It organizes healthcare billing transactions to generate transparency and efficiency, thereby engaging healthcare professionals and benefiting all participants. As a result, Fin-X seeks to reduce the number of disputes, optimize resources, and provide an integrated and consensual view. At its core, Fin-X is a technology platform that connects healthcare players, concentrating on the revenue cycle, operational efficiency, and data organization.

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# What industries are benefiting from this trend?

## SaaS and E-commerce

**Scalable** is a fintech that assists in the growth of B2B SaaS startups. They provide a revenue-based financing model, offering flexible, non-dilutive, and quick capital that allows startups to extend their runway, finance their customer acquisition cost (CAC), and concentrate on growth. In addition, they provide analytics solutions to help founders better manage their capital and understand their metrics.

**Movens** is a fintech focused on improving capital efficiency for e-commerce. The company addresses one of the most significant challenges in e-commerce - working capital. Movens combines technology and business data to assess performance risk, allowing them to finance companies in a way that is secure for the entrepreneur. This unique model significantly reduces capital costs.

## Small & Medium Enterprises

**Conta Simples** is a Brazilian fintech startup that offers SMEs a digital corporate account with expense management tools. Their 30,000 active clients moved R$17 billion in 2023, considering transactions with cards, Pix, transfers, and boleto payments. Conta Simples plans to launch a new credit product, a sort of 'buy now, pay later for Pix,' and aims to expand its customer profile, targeting companies with 100 to 1,000 employees.

**Clara** is a fintech startup based in Mexico. The company offers corporate spend management solutions, including corporate credit cards and an expense management system for small and medium-sized businesses in Mexico, Brazil, and Colombia. Clara's success is attributed to its focus on core elements such as corporate credit cards, B2B payments, and an expense management platform. The startup allows customers to request virtual or physical cards for free, a strategy that has garnered traction with high-growth companies and startups.

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# What industries are benefiting from this trend?

## Education

**Isaac** provides a platform that combines software and banking elements to assist school owners in effectively managing their financial operations. It offers services like "receita garantida" to ensure payment predictability for client schools. The startup's goal is to become the 'operating system' of primary education by addressing the financial management needs of private schools in Brazil.

**Educbank** is a financial support company founded in 2020, based in Sao Paulo, Brazil, and focused on the education sector. The company offers a financial ecosystem dedicated to Kindergarten to class 12 schools, providing management services and financial support by guaranteeing school tuition.

## New Economy

**Noodle** is a Brazilian fintech startup that provides financial solutions and services to content creators, such as YouTubers, influencers, and gamers. Its core products and services include international payment options, royalty-splitting tools, digital accounts, and lines of credit tailored for the creator economy. The company aims to address the financial needs of content creators, who often face challenges with the traditional financial system that is not designed to keep up with their dynamic businesses.

**Bankuish** is a technology platform where gig workers and freelancers leverage their work history data to demonstrate their creditworthiness. Users gain access to a marketplace of preapproved offers from national banks tailored to their unique profile and tools to grow their credit score. The company helps banks acquire new customers, manage risk, and improve customer relationships.

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# What industries are benefiting from this trend?

## Trade Financing

**Finkagro** is a startup that operates as a holistic trade platform, focusing on empowering underserved small and medium-sized businesses (SMBs) in Latin America to engage in global trade. By leveraging technology to blend supply chain, logistics, and financing, Finkagro enables SMBs in Colombia and Mexico to overcome trade barriers. Their platform offers a wide range of services, such as cross-border payments, automated FX settlements, credit lines, a freight forwarder marketplace, digital insurance, market intelligence, customs reporting, and live supply chain tracking.

**Finanex** supports smallholder farmers by empowering them through trade finance solutions. By offering flexible financing options, operating with a digital funding process, and taking on limited risk, Finanex strengthens food exporters in the region, particularly those underserved in the agribusiness sector. By leveraging corporate guarantees, Finanex enables low-risk and high-performance lending for farmers.

AUTHORS: JIHANE HALABI, FOUNDING PARTNER AT HALABI ADVOGADOS

# How changes in regulation and infrastructure impacted the creation of fintechs?

Brazil is one of the most promising global markets for fintechs, banking, payment, virtual assets, and international remittance services.

Over the past few years, the combination of increased use of technology and innovations in financial and payment services, along with rapid financial inclusion and regulatory modernization, have allowed for the democratization of access to investments, payments, credits, account opening, and various other financial services. A true — albeit not the first, nor the last — financial revolution is here to improve the consumer experience and allow for greater understanding and service of an increasingly larger portion of the population through data. This revolution involves profound changes in existing financial institutions, the emergence of fintechs, and the active participation of regulatory bodies.

From a regulatory perspective, the National Congress, the Central Bank of Brazil (BC), and other regulatory bodies related to the topic have been developing various fronts to build, adapt, and modernize the regulatory apparatus of this sector. They aim to create a safer and more attractive field from an investor's point of view and promote greater competition, new entrants, and the development of new technologies.

Over the past 20 years, the BC has been focusing on a series of initiatives that foster innovation, competition, and modernization of the financial and payment market. As a direct consequence of this movement, in 2017, the BC+ Agenda was published, which was updated by the BC# agenda in 2019 that brought, in addition to challenges, efficiency, integration, and benefits for the market, a work agenda centered on technological evolution to develop structural issues of the financial system, based on the premise that cooperation in infrastructure should not represent an impediment to innovation and differentiation of products and services among the various market participants.

In addition to the milestones mentioned on the next page, it is necessary to bring up the initiatives of the BC's regulatory sandbox, which offers a controlled environment in which companies are authorized by the body to test innovative projects for a certain period, and the LIFT (Laboratory of Technological Financial Innovations), a joint initiative of the BC with the Fenasbac (National Federation of Associations of BC Employees) that seeks to encourage the development of technological solutions for the financial system.

To conclude this brief exposition, it is worth mentioning the *Distrito Inside Fintech Report*, published in March 2021, which shows that in 2011, Brazilian fintechs did not represent even 1% of the number of capital contributions and only 0.0014% of the volume invested in the world. Ten years later, Brazil already had a participation of 5.26% in the total volume invested in fintechs in the world, while it represents only 2.4% of the planet's GDP. These numbers show how the segment has been gaining scale and relevance, regardless of the country's macroeconomic situation, and this is primarily due to the evolution in financial market infrastructures and a modern, suitable, and lively regulatory framework for this promising market in Brazil.

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# How changes in regulation and infrastructure impacted the creation of fintechs?

Since then, the market has seen various launches such as open finance, Pix — Brazilian instant payment, virtual asset providers, the DREX (Brazilian CBDC), and the eFX (international remittance service provider), among others, as we can briefly see below:

## Open Finance

The Brazilian open financial system is defined in its regulation as the system that allows customers of financial products and services to permit the sharing of their information among different institutions authorized by the Central Bank and the movement of their bank accounts from different platforms.

## Pix

It's the Brazilian instant payment, a method created by the BC in which funds are transferred between accounts in a few seconds at any time or day. The environment was designed to ensure a flexible and open structure and access to the various participants who offer or will offer innovative and valuable services to users.

## Virtual Assets

In 2022, Law 14.478 was published, which provides guidelines for providing virtual asset services and regulating virtual asset service providers — a market that was not regulated until then. The Law aims to bring more security to this segment and strengthens and encourages new initiatives, innovations, and investments.

## DREX

The DREX, the Brazilian CBDC, is still in the study phase regarding application and feasibility. However, the BC published its guidelines in 2021, and its launch is expected in 2024. The BC expects the retail DREX to enable the population's access to various types of secure financial transactions with digital assets and smart contracts, ensuring greater efficiency of financial markets and financial inclusion.

## eFX

Through the modernization and flexibility of the Brazilian foreign exchange regulation, a regulatory environment more suitable for technological developments regarding the offer of international remittance services was created through this "new" concept called "eFX." The diversification of services and reduction of bureaucracy that come with this concept open space for innovation and new entrants in this segment.

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# How can traditional financial institutions benefit themselves?

## Banking institutions are providing the back office infrastructure for new players

Banks and traditional incumbents recognize the need to expand their reach to a new type of customer, particularly those more interested in digital solutions. Many banks actively seek partnerships with fintech startups to improve their operations and cater to this customer base. These startups leverage technology to fulfill the functions necessary to deliver innovative offerings to customers. Instead of building their own products or capabilities, banks are choosing to collaborate with these fintechs.

This strategic partnership between banks and fintechs allows both parties to benefit. Banks gain access to the expertise and innovative solutions brought by the fintechs, enabling them to enhance their operations and provide customers with a more appealing digital experience. On the other hand, fintechs can leverage the existing back-office infrastructure of banks, accelerating their growth and improving the traction of their new products.

The significance of this trend is evident in the findings of a survey conducted by KPMG. The survey, which included more than 160 financial institutions from 36 countries, revealed that almost 90 percent of the banks either have a fintech strategy in place or are in the process of developing one. Financial institutions are taking various approaches to address fintech, ranging from defensive strategies to protect their existing position to more aggressive ones aimed at growth. This includes building fintech solutions in-house, sourcing third-party fintech solutions, partnering with companies to develop tailored solutions, or even acquiring fintech companies outright to expedite their entry into this space.

Therefore, collaboration between banks and innovative fintechs is reshaping the financial landscape. By partnering with fintechs, banks can tap into the expertise and technology-driven solutions of these startups, enabling them to reach a new and digitally focused customer base. This partnership benefits the banks and fintechs involved, drives innovation, and enhances the overall banking experience for customers.

## Banco BRB's partnership with soccer team Flamengo

Among the notable strategic partnerships done by Banco de Brasilia (one of Plug and Play's Partners), the bank partnered with Clube de Regatas do Flamengo (CR Flamengo), a professional soccer team and sports club based in Rio de Janeiro. This partnership spread the BRB brand across Brazil. Flamengo is Brazil's largest soccer club, with over 46 million fans.

In 2020, this partnership launched Nação BRB FLA, a digital bank that today serves more than 90 percent of the country with a presence in 39 countries and six continents. The digital bank offers various products and services, including debit and credit cards, insurance, an investment platform, access to BRB's VIP room at Brasília International Airport, and coworking spaces. As for BRB, the creation of Nação BRB FLA has been pivotal in triggering a scarcely believable acceleration in the bank's customer base from 600,000 in 2019 to 4.5 million in 2022 before exceeding 7 million in June 2023.

# Crypto & Blockchain

In this section, we delve into the crypto ecosystem in Latin America, with a specific focus on Brazil. We'll examine the evolution of crypto regulation across the region and the impact of cryptocurrencies on solving regional pain points.

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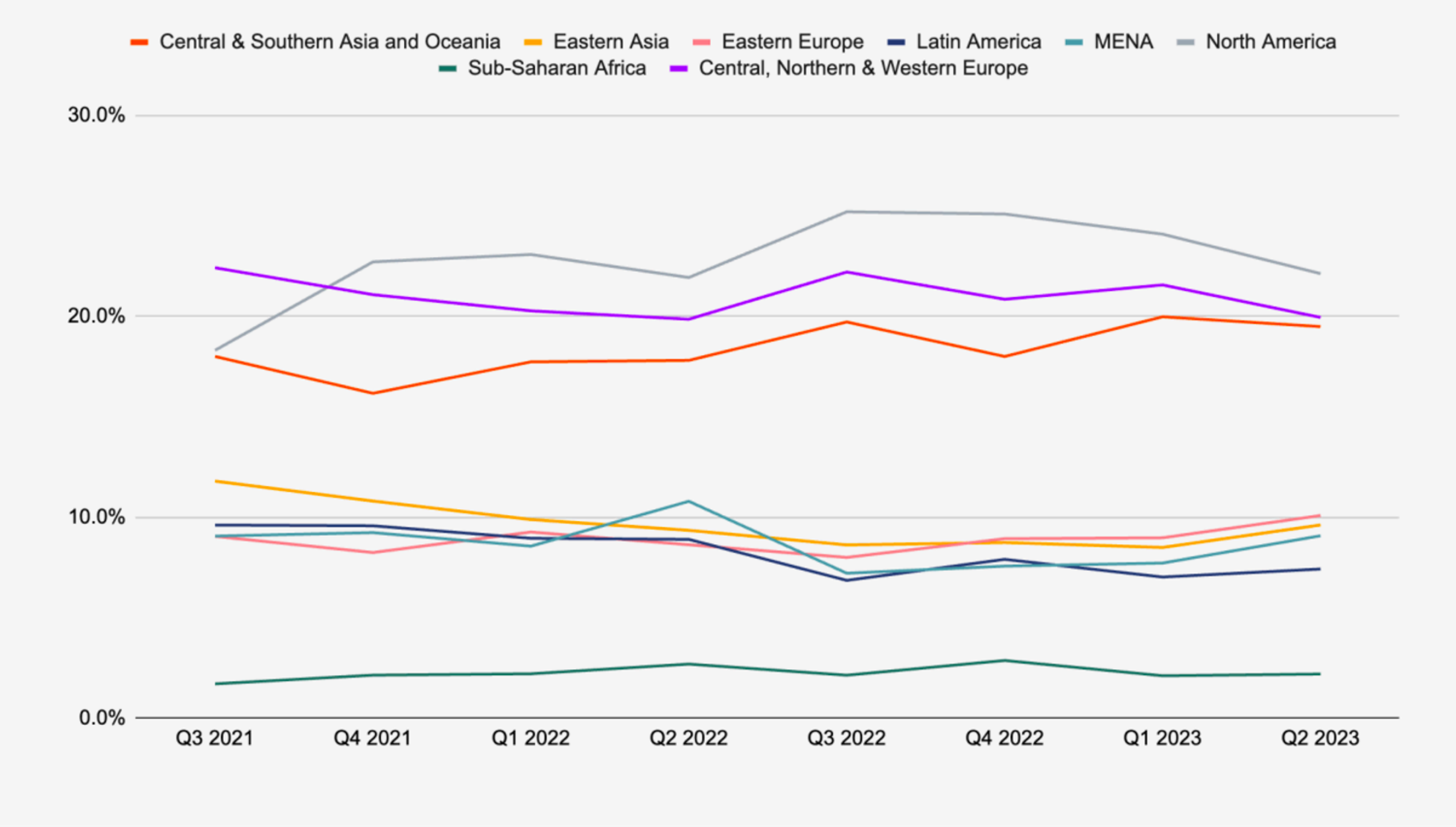
# State of the Crypto Ecosystem in Latin America

The crypto and blockchain landscape in Latin America has been steadily growing, positioning itself as the seventh-largest crypto economy among the regions studied, according to a report by Chainalysis in June 2023.[1] While Latin America is not far behind other regions like MENA, Eastern Asia, and Eastern Europe, it has shown promising potential for adopting crypto and blockchain technologies.

### Share of all cryptocurrency transaction value received by region[1]:




The IMF has recognized Latin America as a frontrunner in digital money adoption[2], providing valuable lessons for the rest of the world. While El Salvador gained attention for granting legal tender status to Bitcoin, other countries in the region have made significant strides in introducing central bank digital currencies (CBDCs) to enhance financial inclusion, improve payment systems' resilience, and lower cross-border remittance costs.

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# State of the Crypto Ecosystem in Latin America

Chainalysis' research revealed that four Latin American countries, namely Brazil, Argentina, Colombia, and Ecuador, ranked among the top 20 in global adoption of crypto assets in 2022.[1] However, the adoption of crypto assets in the region also presents challenges and risks, particularly for vulnerable countries with a history of macroeconomic instability, low institutional credibility, corruption, and extensive informal sectors. To address these concerns, twelve out of nineteen jurisdictions in the region have either implemented or are in the process of creating special regulatory frameworks.

## Regulatory Developments in Latin America[2]:


In terms of transaction volume, most countries in Latin America rely heavily on centralized exchanges, with Venezuela standing out at 92.5% of crypto activity. However, Mexico differs from this trend, with nearly half of its volume being processed through decentralized exchanges (DEXes), aligning more closely with global averages. This preference for DEXes in Mexico contributes to a higher share of purchasing activity in altcoins, as DEXes offer a greater variety of assets than centralized exchanges.[1]

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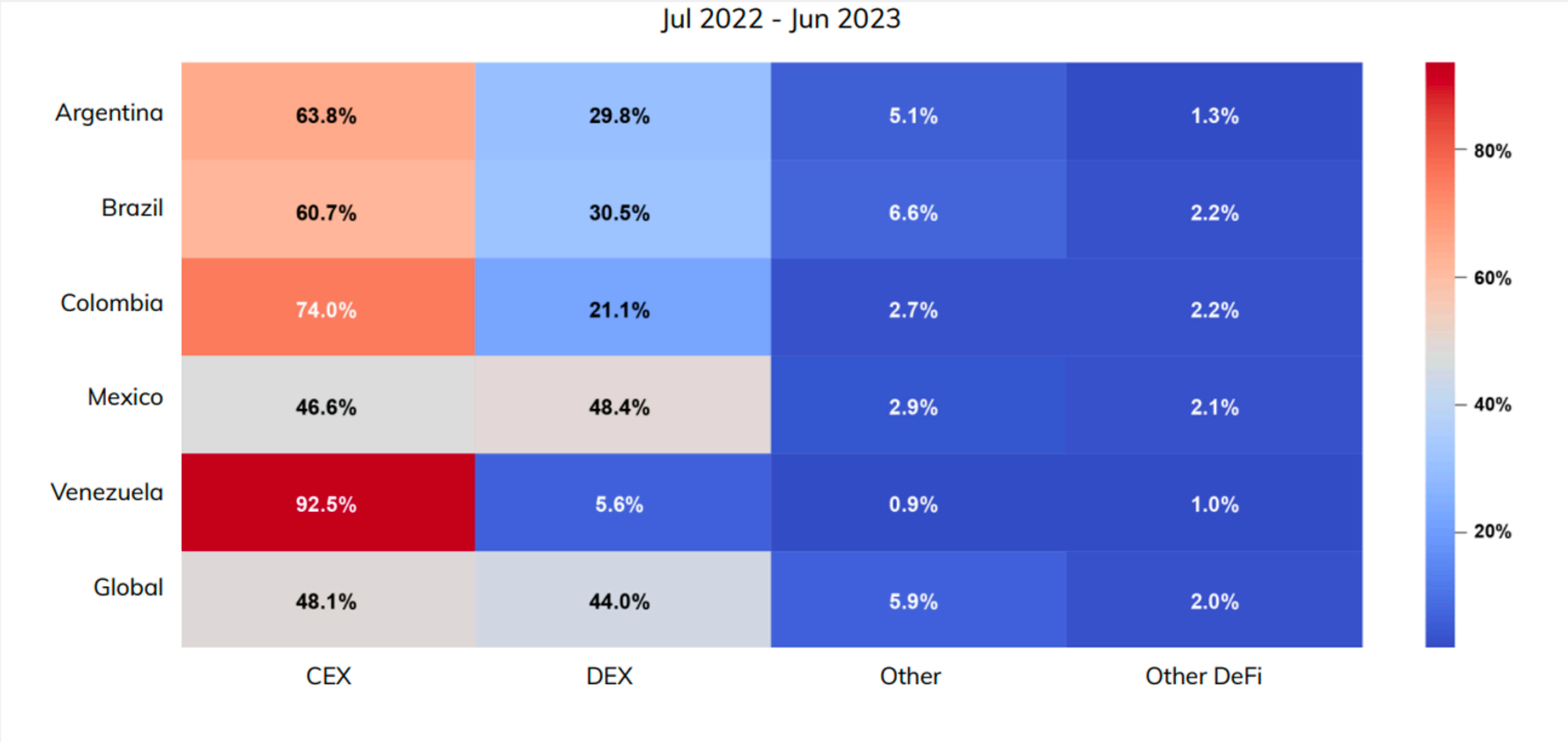
# State of the Crypto Ecosystem in Latin America

## Share of LatAm country crypto activity by platform type vs. global average[1]:




Mexico's embrace of cryptocurrency-based remittances is also noteworthy. As the world's second-largest recipient of remittances, with an estimated $61 billion flowing into the country annually, mainly from the United States, Mexico has the potential to benefit from the faster and cheaper nature of crypto remittances.[3] Bitso, a Mexican exchange, processed over $3.3 billion in crypto remittances from the US to Mexico in 2022, representing 5.4% of the total market.[4] The industry anticipates whether this share will increase in the coming years, not only for Mexico but also for other Latin American countries with significant remittance markets.

Brazil has emerged as a unique player in the region's crypto landscape. With its pro-crypto institutional and regulatory developments, Brazil aligns more closely with wealthier areas that were early crypto adopters, such as North America and Western Europe. Despite a decline in large institutional-sized transfers,[1] Brazil has experienced consistent growth in professional and retail-sized transaction volume. Even during the crypto winter, the "middle class" of high-value crypto traders and basic retail users remained active in the asset class.[1] If this trend continues, it is reasonable to expect Brazil's institutional users not only to return but potentially surpass their previous activity levels during a positive market cycle. According to Eduardo Abreu from Visa, this uniqueness can be attributed to the region's history of technological innovation. He highlighted that Brazilians like technology and innovation and that Brazil has always been a fertile country for adopting new financial technologies. Eduardo mentioned that the Brazilian market has great potential for crypto solutions as an investment and speculation. Additionally, he emphasized that Latin America, including Brazil, has greater penetration of crypto solutions compared to other markets, such as the United States, which have stricter regulations for cryptocurrency startups.

# State of the Crypto Ecosystem in Latin America

A sign of Brazil's growing crypto adoption is the launch of Itaú's crypto trading platform in November 2023.[5] As one of the largest private banks in the country, Itaú started its operations with Bitcoin and Ether and plans to expand to other virtual assets as more regulatory standards are established by the Brazilian Central Bank.

Latin America's crypto and blockchain landscape promises further growth and adoption. The region's position among global crypto economies, its advancements in CBDCs and remittances, and the unique characteristics of countries like Mexico and Brazil contribute to its evolving landscape.

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# Evolution of Crypto Regulation in Brazil and Latin America

There has been substantial progress in the use of distributed ledger technologies and crypto assets in recent years, which also entails significant potential for disruption of the Latin American financial and capital market. This translates into and, at the same time, is supported by relevant regulatory efforts by legislators and regulatory authorities, as is the case of the Central Bank of Brazil (BACEN) and the Brazilian Securities and Exchange Commission (CVM), in Brazil, as well as of other legislative bodies and regulators in countries such as Peru, Mexico, Colombia, Chile, El Salvador, and Argentina.

Urgent regulation is called upon to consider the need to offer greater legal certainty to all players using said technologies and trading assets resulting from them. Legislative houses in Latin American countries have responded to such urgency by passing several Bills, especially Bill 4,401/2021, which gave rise, in Brazil, to Law 14,478/2022. Such law sets the terms for the regulation of digital asset service providers. In addition to the new law, BACEN has issued the digital currency DREX, and CVM, the authority that oversees and regulates the operation of the Brazilian capital market, has recently issued opinions on the tokenization of receivables.

Law 14,478/22 came into effect in June 2023 and sets out the rules to be followed in providing virtual asset services. The law also regulates the providers of said services and defines the list of activities that fall under the Virtual Assets Service Providers (VASP): the exchange between virtual assets and national or foreign currency, the transfer, custody, or management of said assets or of instruments that allow control over them, in addition to participating in financial services and providing services related to an offer by an issuer, or in the sale of assets. The Central Bank of Brazil (BACEN) has the authority to supervise and set out the terms for the operation of said service providers, as determined under Article 1 of Decree 11,563 of 2023.

BACEN not only has the authority to regulate and supervise the VASP but also, in the meantime, has developed the Real Digital project, generally known as DREX. DREX design first started under BACEN Ordinance No. 108,092/2020, which set up an advisory task force that gave rise to a permanent forum for discussions. The efforts resulted in the issue of the rules and DREX and the organization of a special edition of the Lift Challenge Real Digital. The special edition of this lab included focusing on new business models that would benefit from smart payments using technological innovations such as smart contracts and the Internet of Things (IoT), among other initiatives.

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# Evolution of Crypto Regulation in Brazil and Latin America

The LIFT challenge brought together market players interested in developing MVP (Minimally Viable Products) with the real digital, with special emphasis on the following projects: the possibility of tokenizing the right to ownership of vehicles and properties and, through the delivery account (DvP) payment method, the transfer of ownership rights would occur at the same time as payment to the buyer; the offer of dual offline payments (transactions even when the payer and recipient have no internet access); to the delivery of e-commerce orders through a network of programmable lockers IOT-based lockers, in which different e-commerce platforms would have access to secure delivery points; and the possibility of facilitating international payments and transfers, for example, between Brazil and Colombia, by using the payment versus payment (PvP) method, in which holders of different currencies could exchange these currencies with each other, with the exchange occurring simultaneously.

In short, DREX covers three applications: wholesale payment, instant (or real-time) payments, and, above all, the promotion of new business models. The three are feasible thanks to the use of blockchain technology, which offers transparency, speed, privacy, security, and good cost-effectiveness to transactions, in addition to enabling the construction of self-executing contracts (smart contracts) and, consequently, the development of these new business models. The project is currently in the test phase, and rollout is scheduled for 2024.

The importance of DREX lies not only in creating a sovereign digital currency but, above all, in developing a blockchain infrastructure for several financial transactions. There is a clear transition toward a truly tokenized economy, where assets are born and circulated digitally.

All these efforts are expected to create momentum for the issuance of digital assets in the capital market. CVM has recently issued several opinions and official notices to the market, clarifying its understanding of crypto assets. In 2017, CVM set out the rules for Initial Coin Offerings to raise funds for investors through cryptocurrencies. In 2020, CVM designed Regulatory Sandbox 21 to assess and analyze business risks related to crypto assets and blockchain. In 2018, CVM published Official Notice No. 1/2018/CVM/SIN recommending the acquisition of crypto assets by investment funds via exchanges. In 2022, CVM issued Opinion No. 40/2022, which determined the obligation for any securities-based crypto asset offerings to be traded according to CVM rules, both for primary and secondary offerings. In this context, depending on how the deal is structured, tokens may be defined as securities and, consequently, must be submitted to CVM regulation. Finally, in addition to Opinion 40/2022, CVM issued Resolution 175 on December 23, 2022, which comes into force in October 2023, authorizing financial investment funds to invest in crypto assets, provided CVM or BACEN-approved entities trade them prior to the Resolution, only indirect investments in these assets were authorized.

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# Evolution of Crypto Regulation in Brazil and Latin America

CVM's most recent understanding on crypto assets was issued under Official Notice No. 6/2023/CVM/SSE, in which CVM set out certain requirements to classify receivables or fixed income tokens as securities, pursuant to Law 6,385 and the recently approved Securitization Law (Law 14,430). Current capital market laws still pose challenges on the registration of public offers of tokens as securities. However, while definitive rules on the matter are still pending, CVM has found a way for such offers to be made via crowdfunding platforms.

In addition to Brazil, other Latin American countries play a leading role in the development and implementation of crypto asset regulations. Such measures include the ratification, in 2018, in Mexico, of the Law for the Regulation of Financial Technology Institutions, known as the fintechs Law. In short, the purpose of the law is to regulate the financial services provided by financial technology institutions, as well as their organization and operation. The National Banking and Securities Commission and the Bank of Mexico are the authorities that supervise and oversee the enforcement of the law. In turn, in Colombia, the Financial Superintendency approved, through External Official Letter 016 of 2021, the creation and implementation of a regulatory experiment (regulatory Sandbox) to experiment and study the regulation of cryptocurrencies. More recently, in 2023, the Financial Regulation Unit (URF) included a study on the risks, benefits and regulatory treatment of blockchain-based developments in its agenda. The study, however, remains unpublished. In Peru, in 2022, Congress submitted Bill No. 1042/2021-CR, which was the country's first attempt to create a legal framework for cryptocurrencies. Similar to the Brazilian Bill, the Peruvian bill defined several key concepts such as crypto assets, VASP, blockchain and cryptocurrencies. In Argentina, though there is no regulation focused on cryptocurrencies, Decree 796/2021 established fiscal control over companies that carry out transactions with cryptocurrencies, whereby taxes are charged on bank credits and debits. Finally, under Legislative Decree No. 57 (Bitcoin Law), El Savador regulated Bitcoin as the official currency with no limits on transactions, by means of an e-wallet called “Chivo”. El Salvador is the first country in the world to accept Bitcoin as an official currency.

In view of the foregoing scenario, it is arguable that Latin American regulatory authorities have made material efforts to understand and develop new technologies as infrastructure, which has placed Latin America at the forefront of this process, creating a safe and very promising environment for the disruption of the Latin American financial and capital markets, in the near future.

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# Impact of Cryptocurrency Protecting Against High-Inflation Countries in Latin America

Cryptocurrency has significantly impacted the protection of individuals in Latin American countries with high inflation, such as Argentina and Venezuela. These countries have long struggled with economic issues as their currencies rapidly lose value, making it difficult for people to save money or carry out everyday financial activities.

In Argentina, the value of the Argentinian peso has declined by approximately 51.6% in the year leading up to July 2023. Despite this economic turmoil, Argentina leads Latin America in cryptocurrency usage, with around $85.4 billion in cryptocurrency transactions during the same period[6]. Argentina also ranks second highest in the region for cryptocurrency adoption. This is mainly due to the country's high inflation rates and restrictions on purchasing foreign currencies, making cryptocurrency an attractive savings option.

On the other hand, Venezuela has faced severe economic problems caused by its government. The Venezuelan bolivar has experienced one of the most extreme cases of inflation in history, skyrocketing by over 1 million percent. In this dire situation, cryptocurrency, particularly stablecoins, has played a crucial role in helping Venezuelans safeguard their savings. By utilizing cryptocurrency, Venezuelans can protect their savings from a significant loss in value.

There has been a substantial increase in the usage of stablecoins in Latin America. This has been instrumental for individuals who face difficulties obtaining foreign currencies due to regulations or economic challenges. Stablecoins provide a viable solution for saving money in a foreign currency that is easy to use.

To mitigate the impact of inflation, many individuals in these countries have turned to local startups that offer stablecoin options. People can safeguard their savings and secure their livelihood by converting their money into stablecoins. Additionally, some businesses in Argentina and Venezuela now accept stablecoins as a form of payment. This approach has proven successful in protecting individuals' savings and providing them with the advantages of cryptocurrency without the significant fluctuations in value typically associated with it.

The role of cryptocurrency in protecting against high inflation in Latin American countries cannot be overstated. Argentina and Venezuela have faced substantial economic challenges, but cryptocurrency, particularly stablecoins, has provided people with a means to safeguard their savings and navigate the complex financial landscape.

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# Brazil is Leading the Innovation for Tokenized Assets

Tokenization has emerged as a powerful tool within DLTs, enabling the creation of digital representations of assets that can be easily traded on a blockchain network. This has made trading assets such as real estate, vehicles, art, and even intangible assets like copyrights and royalties more accessible and liquid.

DLTs, particularly in the financial services industry, have shown promise in settlement and trading infrastructure. For financial institutions, utilizing tokenized versions of traditional financial instruments can improve operational efficiency, ensure transaction finality, and enhance security. These characteristics are crucial in expanding the supply and scope of financial services and reducing information asymmetry between entities and customers.

Although the asset tokenization market is still relatively small compared to conventional analog assets, it has been experiencing rapid growth. The total value of tokenized real-world assets on public blockchains has increased from $1 billion to $2 billion in the last 12 months, with the Ethereum network hosting the majority of these tokenized assets.[7]

Traditional financial institutions have also started to experiment with these innovations. For example, the European Investment Bank has issued bonds on the Ethereum blockchain, and Moody's has rated a €10 million senior unsecured digital green bond issued by Société Générale, which was also based on Ethereum.[8] Moody's anticipates that over time, public blockchain networks like Ethereum and traditional infrastructure will become more interlinked, further enhancing the use cases of blockchain technology and promoting industry growth.

In Brazil, the Brazilian Securities and Exchange Commission (CVM) has implemented a tokenization regulatory sandbox, allowing pilot projects to issue tokens representing securities within a regulated and monitored environment. This is a significant step toward establishing the standards necessary for widespread regulated tokenization in Brazil. Furthermore, the crypto regulation implemented in December 2023 has set the stage for the growth of tokenized assets in the country. The regulation outlines the specific entities responsible for regulating tokenized assets.

The Brazilian Development Association (ABDE), in collaboration with institutions such as the Securities and Exchange Commission (CVM), has created The Financial Innovation Laboratory (LAB). This initiative aims to expand discussions on crypto assets by including two new fronts: the Legal and the Issuers, which involve tokenized companies.[9]

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# Brazil is Leading the Innovation for Tokenized Assets

Mercado Bitcoin, the largest crypto exchange in Brazil, has been at the forefront of tokenization. In 2018, the company established MBDA Digital Assets, the country's first tokenization platform. Since then, they have tokenized over 100 distinct assets from various categories, totaling over R$ 400 million. These tokenized assets range from court-ordered payments ("precatórios") to football-related rights. Recently, Mercado Bitcoin partnered with Rappi, the delivery unicorn from Colombia, to tokenize its receivables. This aims to improve liquidity for gig-workers who typically receive payments after a 15-day period.[10]

The adoption of DLTs and the tokenization of assets hold great potential in Latin America, particularly in Brazil. As regulatory frameworks continue to evolve and more institutions embrace these technologies, the region is poised for further growth and innovation in the crypto and blockchain space.

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# Central Bank Digital Currencies (CBDC)

This section delves into Brazil's transformative journey toward creating the DREX, a digital form of its national currency. It highlights the role of fintech innovation and expands to a broader perspective on CBDCs, their benefits, and the future possibilities they unlock.

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# DREX and CBDC Applications

Brazil's journey toward creating the digital real, a digital form of its national currency, is a compelling narrative of technological innovation and financial evolution. This journey began with the strong foundation provided by Brazil's robust banking sector, which underwent significant modernization and consolidation in the late 20th century. This groundwork was crucial for the country's digital advancements. The rise of fintech companies further propelled this journey, fueled by a tech-savvy population and a supportive regulatory environment. These **fintech innovators paved the way for more innovative financial solutions, including digital currencies.**

A pivotal moment in this journey was the introduction of **PIX**, Brazil's instant payment system, in 2020. This system revolutionized the financial landscape by demonstrating Brazil's capability to implement advanced financial technologies on a large scale. Moreover, the **COVID-19 pandemic played a significant role in accelerating the shift towards digital transactions**. As the pandemic encouraged people to avoid physical contact and cash transactions, there was a **noticeable and rapid shift towards digital payments.**

Recognizing these evolving trends, the Central Bank of Brazil took proactive steps towards exploring a digital currency. The aim was to **complement the existing monetary system and leverage the benefits of digital transactions**. The culmination of these efforts led to the birth of the Digital Real. This digital currency represents the digital form of Brazilian fiat, Real, issued and backed by the Central Bank. It aims to **streamline transactions, enhance financial inclusion, and align Brazil with the global trend of digitalization in finance.**

The evolution of the Digital Real in Brazil is not just a story of a new currency form. It is a testament to the country's progressive financial landscape and its unwavering commitment to embracing technological innovations. This journey from traditional banking to digital currency epitomizes the global shift towards more efficient, secure, and inclusive financial systems, marking a significant milestone in Brazil's financial history.

Central Bank Digital Currencies (CBDCs), exemplified by Brazil's Digital Real, are transforming the financial sector. They leverage digital technology to enhance traditional banking systems. These currencies offer a host of benefits that collectively contribute to a more efficient, secure, and inclusive financial landscape.

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# DREX and CBDC Applications

One of the most significant advantages of CBDCs is the enhanced efficiency they bring to financial transactions. They **enable instantaneous payment processing, drastically cutting down the time needed for both cross-border and domestic transactions**, representing a notable advancement over legacy banking systems. Additionally, by eliminating intermediaries, **CBDCs reduce the costs associated with money transfers and financial operations**, making them more cost-effective and accessible.

According to Eduardo Abreu, VP of New Business Development at Visa, reducing operational processes and disintermediation can benefit banks in terms of costs and efficiency. He emphasized that improving the customer experience is essential for the widespread adoption of decentralized finance. By eliminating bureaucratic processes and intermediaries, it is possible to reduce costs and make transactions more accessible.

In terms of security, CBDCs offer superior traceability compared to traditional cash, significantly aiding in combating financial crimes like money laundering. Incorporating **blockchain and other secure technologies ensures a higher level of protection against cyber threats, thus bolstering the security of financial transactions.**

A pivotal benefit of CBDCs is their **ability to reach unbanked populations**, particularly in remote or underserved areas, which is crucial for global financial inclusion. Additionally, digital currencies can be designed to be user-friendly, catering to individuals with limited financial literacy or technological skills.

CBDCs empower central banks to implement monetary policies more directly and effectively. They also open the door for innovative approaches like programmable money. Their digital nature also facilitates the collection of real-time economic data, which is invaluable for informed policy-making.

Introducing CBDCs spurs innovation within the fintech sector by creating new financial products and services opportunities. This innovation drives a competitive landscape, compelling traditional financial institutions to enhance their offerings. Furthermore, CBDCs have the potential to streamline international transactions, thereby significantly facilitating global trade. The development of CBDCs may also lead to global standards in digital currencies, **enhancing interoperability between different financial systems.**

CBDCs also play a critical role in **fostering e-commerce growth by facilitating smoother and more secure online transactions**. They encourage the adoption of digital technologies among consumers and businesses, promoting a more digitally adept economy. These currencies pave the way for a more interconnected, stable, and digitally forward financial ecosystem, transforming the way we perceive and engage with money in the modern world.

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# DREX and CBDC Applications

Naturally, throughout the evolution of a country's financial system, notably through integrating a digital fiat (CBDC) into their banking system, the next step forward is in tokenizing **assets.** Tokenization simplifies asset management, allowing for more efficient tracking, transferring, and auditing of financial assets. It also **increases the liquidity of deposits**, making it easier for individuals and businesses to access and utilize their funds in real time. By converting deposits into digital tokens, the security of assets is significantly improved, reducing the risk of theft and fraud. This approach opens avenues for innovative financial products and services, including more flexible savings and investment options.

Tokenization can increase market efficiency by streamlining processes and reducing the friction associated with traditional deposit handling. It could reshape banking operations, requiring banks to adapt their services and infrastructure to accommodate tokenized assets. It opens up opportunities for fractional ownership of assets, investing in high-value assets that are more accessible to a broader range of investors. The tokenization of deposits could revolutionize the credit and lending sectors by providing **more accurate risk assessments and creating new lending models powered by AI** based on tokenized assets.

To conclude, transforming money from tangible coins and notes to digital forms has been a long journey marked by significant milestones. Initially, the concept of money revolved around physical exchange, with coins and banknotes being the primary mediums. This changed with the advent of digital banking and electronic transactions, which introduced a new era of convenience and speed.

In the context of digital real and similar initiatives worldwide, integrating CBDCs signifies a monumental shift in the financial sector. By combining traditional currencies' reliability with digital technology innovation, CBDCs promise to revolutionize financial transactions. From improving efficiency and security to fostering financial inclusion and economic growth, the benefits of CBDCs are manifold.

These advantages position CBDCs not just as a new form of currency but as **catalysts for a more interconnected, innovative, and inclusive global financial system.**

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# How interoperability with CBDCs will impact the crypto ecosystem?

In 2019, when the crypto market was going sideways after the speculative bubble burst of 2017–2018, it was the central banks that reignited the flame by prioritizing the debate on an official cryptocurrency to combat the idea of the Libra consortium, led by Facebook/Meta.

This project brought together major tech companies (e.g., Airbnb, Uber) and traditional financial market institutions, such as Visa and Mastercard, to create a stablecoin backed by a basket of the leading global currencies. The fear was that it would create a new currency, immediately accessible to billions of people and without any interference from regulators.

It was undoubtedly a great idea, as measured by the speed and relevance of the Central Banks' reactions.

From there, maintaining a stance of rejecting crypto was no longer the safest way to deal with the possibilities created by this new technology. The articles published by the BIS began to analyze how blockchain could be the basis for the evolution of money, and various monetary authorities began CBDC projects.

If crypto were the new language for the traditional financial market, then Satoshi Nakamoto would always be correct.

Obviously, not everything happened as planned. Contrary to what was stated in the famous white paper published in October 2008, #bitcoin did not become a payment currency. But it was, indeed, the reference for principles that guide the construction of a new payment system - which may be interoperable with so many other applications developed in the cryptoeconomy.

Although regulators' movement raises criticism for restricting the decentralization promoted since the early days of digital assets, the creation of official tokenized currencies or systems based on DLTs to support financial transactions carries the entire market to the same programming language as Bitcoin.

And within the same architecture, we can observe the movement from an optimistic perspective. Interoperability is a standard function in the crypto environment, given that the programmability of transactions allows various protocols and tokens to communicate by design or smart contracts (bridges).

This is how various projects communicate with relative ease (compared to assets and transactions of the web2) to fit in wallets, exchanges, and DeFi protocols.

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In Brazil, the Central Bank chose to build a test permissioned network based on Hyperledger Besu to carry out proofs of concept with participants from the local market. The program, called Drex, is plural and brings together traditional companies (such as banks and market infrastructures) and crypto companies (such as Mercado Bitcoin, which leads a consortium formed by Mastercard, Cerc, Sinqia, and Banco Genial).

The proposal aims to validate the benefits of a distributed network for constructing DvP (delivery versus payment) and PvP (payment versus payment) transactions, as in the investment in a public bond custody by the Special System of Settlement and Custody — SELIC.

For this, it provides for issuing deposits, tokenized electronic currencies, and transforming securities into digital assets. The hypothesis is that this form of representation will allow an atomic reconciliation of transactions without risks of matching bases between private and public agents.

Without the risk of mismatching balances, it would be perfectly possible to place assets as collateral for subsequent operations. The inclusion of liens on assets used as collateral for loans, for example, would gain a scale unfeasible for the current model, in which there are several non-interoperable bases, each focused exclusively on a certain group of goods.

Within the scope of Drex, we will be able to test the inclusion of a lock on a particular public bond for the granting (simpler and cheaper) of a loan, releasing tokenized Reais from the adhesion to a specific smart contract. In the future, a bridge to be established with protocols beyond that network, catering to applications unrelated to banking or investment transactions, is possible.

Here, we must remember that crypto is not about financial speculation. Satoshi Nakamoto discovered a new function for the internet, in a construction that took to the digital environment a missing element: full ownership (without depending on stages to be executed in the physical world).

Therefore, the interoperability of a CBDC enables Central Banks to insert their official currencies (and the entire financial and capital market) into the new digital economy, transforming the crypto ecosystem from a niche to everything: Cryptoeconomy will just be the Economy—a tokenized economy.

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