

Central banks, the monetary system and public payment infrastructures: lessons from Brazil's Pix – online appendix

This online appendix gives further information on the structure of the Brazilian payment system and the operation of Pix.

The Brazilian retail system

The digitalisation of retail payments in Brazil is supported by Law No 12,865/2013, which authorises the Central Bank of Brazil (BCB) to regulate retail payments. The BCB regulation defined several principles for payment arrangements and payment institutions, including efficiency, security, interoperability and financial inclusion. It also allowed for limited-purpose payment service providers (PSPs), which operate in a fully digital environment and with a regulatory burden proportional to their risk. Limited-purpose PSPs have introduced prepaid payment accounts (e-money), electronic payment instruments (cards and account-to-account transfers) and acquiring services. This has provided for the financial inclusion of millions of individuals and small entrepreneurs. Moreover, it has opened up the market for acquiring services, which hitherto had a monopoly structure.¹

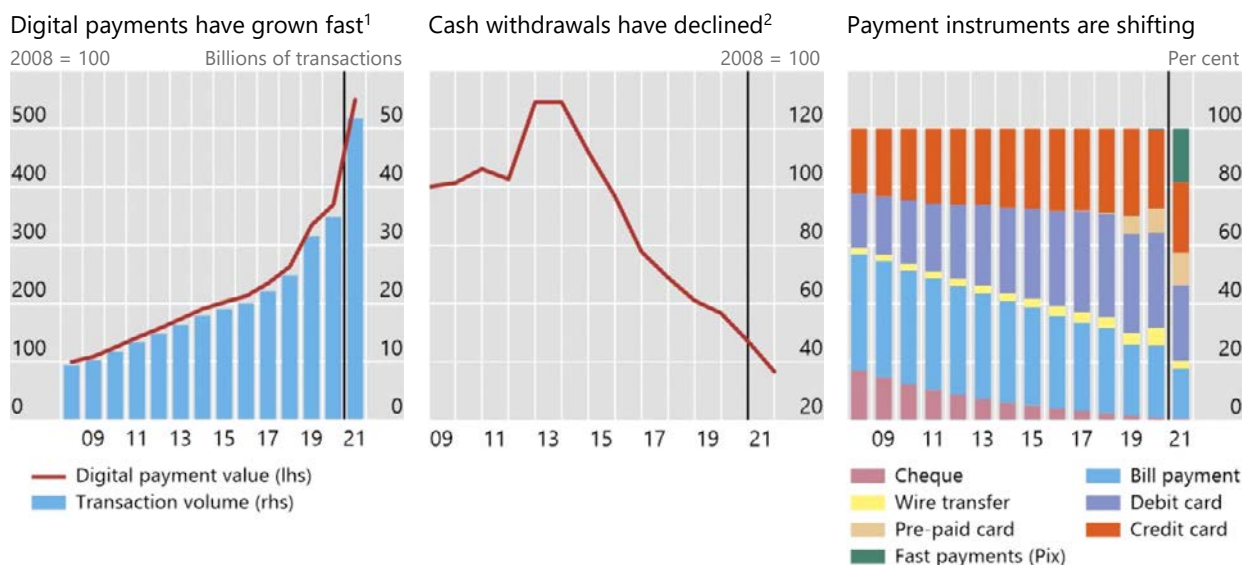
This growth has led to a growing array of payment options for consumers and merchants, and lower costs. The number of debit and credit cards doubled between 2013 and 2021, while the number of point-of-sale (POS) terminals grew from 3.9 million to 16.4 million. Payment institutions and digital banks issued around 20% of payment cards. In acquiring services, incumbent institutions had a market share of roughly 55%, but they provided less than 20% of POS terminals in operation, since entrants, mostly payment institutions, were dominant among SMEs. Meanwhile, the merchant discount rate (MDR) for credit cards fell from 2.8% in 2014 to 2.2% in 2021, and from 1.6% to 1.1% for debit cards.²

The share of adults with a transaction account rose from 56% in 2011 to 70% in 2017. Moreover, the number of digital payment transactions rose by an average of 21% per year over the past five years (Graph A1, left-hand panel). This occurred in parallel to a decline in the use of cash; the amount withdrawn per adult at automated teller machines (ATMs) fell by 63% between 2008 and 2021 (centre panel), despite a rule guaranteeing four free ATM withdrawals per month. Among payment instruments, card transactions grew from 41% of all transactions in 2008 to 70% in 2019, while the relative share of bill payments and cheques declined (right-hand panel). The Covid-19 pandemic boosted account-to-account transfer transactions between accounts; these grew by 67% in 2020.

Still, despite substantial policy efforts and encouragement to self-regulate, there was a lack of interoperability between different providers in the market. Some services (such as peer-to-peer transfers) were subject to high costs and high entrance barriers. The lack of action by the private sector provided the motivation for work on additional policy responses.

¹ Until 2015, there was only one acquirer for the Visa network and one for the Mastercard network.

² This is due largely to a 2018 regulation that capped the interchange fee to 0.8% on each individual transaction, and 0.5% on the average of transactions per scheme. The expansion of the card market to include SMEs has contributed to a smaller decline in average MDRs.



The black vertical lines indicate the launch of Pix in November 2020.

¹ Figures do not include transfers between different accounts with the same bank. ² Amount withdrawn per adult, CPI deflated.

Source: Central Bank of Brazil.

Recently, more disruptive innovations have emerged. These include payment services in new closed loop systems that require both payers and payees to be customers of the same institution. Meanwhile, Brazil has also seen growing retail investment in cryptocurrencies. While data on actual use are scarce, the volatility of large cryptocurrencies and the unregulated nature of the market raise concerns for consumer protection and potentially for financial stability.

The operation of Pix

The Central Bank of Brazil (BCB) launched Pix on 16 November 2020.³ It is an instant payment scheme developed, managed, operated and owned by the central bank. Its name is derived from pagamento instantaneo (“instant payment”), with the “x” representing the system’s interoperability. The goals are, inter alia, to enhance efficiency and competition, encourage the digitalisation of the payment market, promote financial inclusion and fill gaps in currently available payment instruments. The BCB is both the system operator and the rulebook owner (Graph A2). As the system operator, the BCB was solely responsible for developing the infrastructure – namely a real-time gross settlement (RTGS) system and a proxy database – and is the sole operator. As the rulebook owner, the BCB sets all rules and technical specifications, including those for application programming interfaces (APIs).

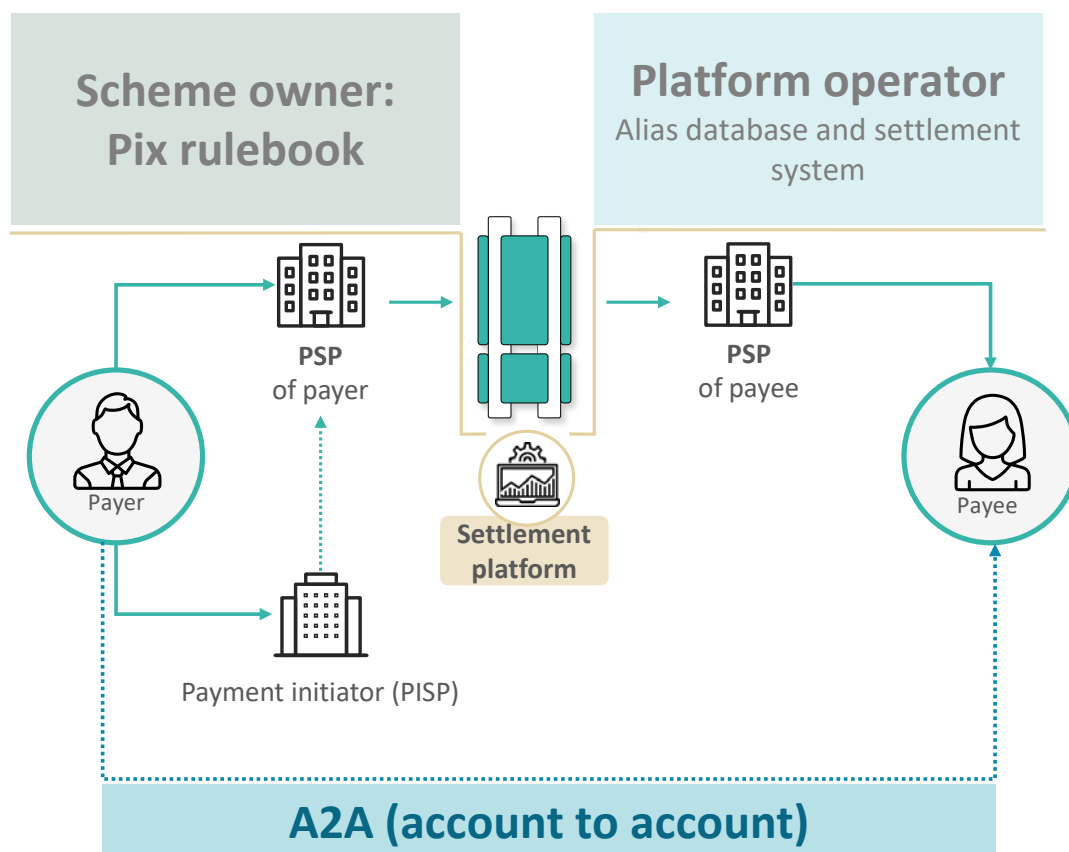
As the BCB has operated an RTGS platform since 2002, operating the instant payment settlement system (known as the SPI) was a natural evolution of this role. The BCB also emerged as the natural owner of the new instant payment scheme, given its aim of serving the public interest within a complex payments landscape. As the rule setter, the BCB has promoted competition in the system. The BCB led the development of Pix with a collaborative philosophy in mind. It involved stakeholders – from PSPs to commercial associations and end users – through a formal assembly known as the “Pix Forum”.

³ The project followed a very fast implementation path. The BCB made the formal decision to develop Pix in 2018. On 5 October 2020, the proxy database containing account aliases – Pix keys – started to be populated by end users through the mobile apps of Pix participant PSPs. On 3 November 2020, a period of restricted operation started with a limited number of end users within the PSPs’ customer base being introduced daily.

Pix is an open-loop scheme, in which both banks and non-banks (collectively the PSPs) participate. Users can initiate payments through mobile applications offered by the private PSPs. Aliases represent a set of information needed to identify an account, so as to simplify credit transfers. Standardised QR codes help to ease the process of payment initiation. Minimum user interface requirements set by the BCB ensure uniformity of experience across all end users.

Framework of Pix ecosystem

Graph A2



Source: Central Bank of Brazil.

For merchants, Pix offers low-cost transfers across a multiplicity of use cases – for credit transfers, bill payments and e-commerce, as well as scheduled and recurring payments and more – across many sectors. To help automate and reconcile payments, the BCB has promoted the standardisation of APIs to incentivise a more competitive ecosystem and better services.

To ensure a user-centric approach, the Pix Forum aims to diversify input into the development and management of Pix. In this way, there is continuous improvement over time, so that the evolving needs of end users continue to be met.