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The Instant Payment Mandate: The Central Bank of Brazil and Pix

"Huge changes are underway in payments. Society demands something that is fast, cheap, safe, transparent and open."

– Roberto Campos Neto, President, Central Bank of Brazil

Heart pounding late into what would otherwise be a quiet Sunday night, João M. P. De Mello was awake with mind ablaze at the possibilities before him. The next morning, November 16th 2020 at 9:30am on the dot, the Banco Central do Brasil (BCB) would launch its nation-wide instant payment scheme: Pix. It was designed to kick-start a wave of pro-consumer FinTech advancements in the country, where growth in the sector had been relatively halted. The few startups who had attempted to make the uncertain leap toward a streamlined approach to payments and other banking services still failed to brush shoulders with the crowd of large actors running the show. The major financial institutions had been resistant to advancing much beyond the bedrock of credit cards and other more basic physical payment methods, and preferred instead to dig their heels into that world of "plastics."

The grand rollout had been anticipated internally at the BCB for several years; it was the result of a long series of pushes and prods to spur competitive innovation within Brazil's financial sector. De Mello himself had conjectured from the beginning that, were the chief industry players unwilling to develop and deploy more current solutions that could take advantage of the latest internet capabilities and encryption methods, the BCB would likely have to design the rails to do so themselves. While other central banks worldwide were typically familiar with providing a system for settling inter-bank payments, a competency for which the BCB was no exception, this centralized provisioning of services aimed at inducing changes in the broader market was novel territory. De Mello, as Deputy Governor for Licensing and Resolution, headed the team that would pilot this embarkation into new waters. He knew that, despite so many certainties surrounding the backend functionality and success in a limited preliminary onboarding of the service, his team was inching ever closer toward a waterfall of questions from the wider industry and populace.

This form of universalized payment scheme initiated by a central bank was not something sought by many countries. The key to the BCB's surety in its own ability to launch the program stemmed directly from its strong mandate. This power went hand-in-hand with the BCB's commitment to

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financial inclusion; those at the top had made active steps forward within the Alliance for Financial Inclusion, wherein the BCB had come to be recognized as a leader in the field. Instead of forming blind pledges lacking teeth, it was one of the seventeen founding regulatory institutions under the Maya Declaration in 2011, signed at the Global Policy Forum in Mexico. Within those accords, the BCB had outlined a slew of specific national commitments to financial inclusion. Almost a decade later, it was staying true to its word.

Yet, in what might otherwise rest as a seemingly painless tale of a governmental institution taking its mission to heart, the Pix Team knew all too well the ripples in the water this move would cause. As the BCB took aim at tackling the inefficiencies of the current payments industry, questions sprang from all sides about what other systems and capabilities might arise as the launch unfolded. If the central bank saw itself as the pioneering provider of the payment rails, how long must that role last, and what other services would it enmesh itself in during the process? As the BCB sought to standardize the underlying payment processes, how much leeway for innovation could it really provide knowing this background was fixed in place? De Mello felt these questions bouncing around in his mind, and each hinted at a deeper problem he had been formulating for quite some time: what would be the long-term consequences of the move that he had not anticipated? At this, he took measured pause. Would Pix be the great “un-locker” or blocker of Brazil’s financial future?

Background on Brazilian FinTech

That Brazil was behind in financial inclusion had been apparent to the team at the BCB since well before the Maya Declaration (see **Exhibit 1** for details). While in many ways the country was an exemplar for growth, especially within South America, it was nonetheless evident that gaps in the financial system had begun to form not solely due to the country’s developmental nature, but rather due to complacency from an established yet guarded financial industry. A handful of major banks held 80% of the market share, and owned virtually all of the related payment business. High barriers to entry, specific focus on a few core products and services, and an innate catering to certain geographical and income-based demographics typified the highly verticalized nature of the Brazilian financial industry (see **Exhibit 2** for industry details). Within these limitations, banks had grown fully aware that the steep margins they reaped could easily evaporate should innovation toward more modern products be adopted.

The banks held large returns from wire transfers. This was the principle method of conducting remote payments, and the limited available providers ensured high transaction costs gained by the suppliers. While any developing country might initially host few entities capable of enabling such technology securely, Brazil’s expansive land area and spread out population also played a part in deterring an abundance of participants. Similarly, guaranteeing proliferation of plastics—such as credit, debit, and prepaid cards—was a limited venture. The proportionately high costs of facilitating these transactions was felt strongly by merchants; it was common to pay as much as 3% on an average charge. This in turn discouraged merchant uptake, and a significant portion of the economy was still cash-based. Even up through 2019, 47% of Brazil’s payment transactions were done in cash. Checks, credit cards, and debit cards accounted for 22%, 18%, and 12% of that share, respectively. Of the country’s approximately 161 million adults, about 55 million went completely unbanked, and the informal economy comprised a large share of all transactions.

While it was clear to De Mello and others how much the country stood to gain from the spread of instant payments, it was also evident that banks would not want to compromise their current margins. Instant payments loomed in front of them as an innovative Pandora’s Box. Once opened, any young tech-inclined company might swoop in and begin to provide a host of services to the sizeable

population. Banks would rapidly see margins decline as their services became obsolete, and user base, rather than exclusivity, would become the differentiating factor in who could survive.

With this in mind, the BCB approached the private sector in 2014 and 2015. Giving them the lay of the land, the BCB teased the industry publicly that the gap needed to be filled. The message was simple: come up with a fast payment platform of your own, or the central bank will launch it for you. Over the following years, small efforts were made in the way of bolstering wire transfer efficiency, but these were paltry gains compared to what nation-wide instant payments could bring. Feeling they had no other option, the BCB announced its plan to enact their centralized platform.

The Plan for Pix

The BCB maintained that, even though they would carry their plan in a centralized manner, the end goal was not to become the permanent provider of that platform per se. Rather, they sought to be the catalyst such that the overall instant payment scheme and corresponding adaptations within the economy would come to reality. Similarly, they saw being the one to pull the trigger as an important step for neutrality. Participants had a major concern for neutrally allowing entry, and a central bank was the ideal agent to ensure long-term access for newcomers that could resist the verticality problems of yesteryear.

Several other countries had seen their private sectors develop instant payment platforms through a fragmented and typically privatized methodology. In such schemes, payments moved between certain applications and banks more readily than others, and the result was a landscape wherein natural barriers to entry could re-arise as explicit or de facto partnerships formed between the banks and FinTech providers. Some cases even featured banks that had managed an entire pipeline themselves, which was a model that could potentially further insulate customers, merchants, or entire sectors of the economy from one another. The Pix Team recognized that economies of scale and positive network gains would be bolstered by using a single, universal system when compared to these models.

The BCB envisioned Pix as a two-pronged system. There would be a settlement platform and an alias database. In the case of a wire transfer, Pix would host a “key,” which would operate as an alias for the receiver’s account information. This alias could be an email address, a cell phone number, a social security number, or a randomly generated number should the receiver not be willing to share any private information with a stranger. These different alias designations could allow for several different relationship types between users, and could adjust to the desired level of anonymity. The BCB would run the database to identify the receiver’s account information, though the actual authentication step would be conducted independently. In this manner, the BCB would act as the switch in the flow of information among Pix participants.

The other side of the platform would be for the institutions. Pix would be designed such that its rails could be used by any approved entity, and its standardization of information flow could be adapted to fit a variety of use cases. For example, one could imagine a simple peer-to-peer payment app running on its lines, or a more sophisticated interbank system working just as well. Pix, in simple terms, would be the roads, and the BCB their owner; many different types of traffic could cross through those roads, but they all had to meet the approval of the BCB to gain access and maintain operations. In return, the BCB ensured their safety and expedience while on board (see **Exhibit 3** for details).

In presenting this vision of Pix to banks, none took the BCB very seriously. The atmosphere from banks around the BCB’s initial proposals was that the central bank would never be able to pull it off—they would not have the resources nor the capability. When comparing them to payment schemes on

a similar scale, such as Visa or Mastercard, Brazilian banks deemed the BCB to be punching far above its weight class. What the banks failed to account for was the power of the BCB's regulatory mandate, and its strong will to improve the retail payment landscape. As if tempting fate, instead of an uproar or resistance around the initial vision, the prevailing attitude was straightforward: "Let them fail."

Preparation and Rollout Process

The tipping point for convincing the industry came during the pre-launch period, during which the BCB started populating the alias database. From the outset, they announced that every transactional account—including demand deposits, savings, and payment deposits (payment accounts)—would be included. The database would allow identification of those accounts through use of the unique aliases or, in the case of convenient or more anonymized identification, a QR code. From there, the BCB began the process of registering those aliases. Individuals could go to banks and specify how they wanted to be identified, and chose by themselves what they preferred, be it cell phone number, email, or the like.

While the alias database facilitated a wider variety of transactions, it was not strictly necessary to have an alias to use Pix; the payer could also provide the receiver's account information directly and initiate a remote payment through that method. However, it was evident that in the majority of cases, an alias would be preferable from the user's perspective. The value placed on securing one's alias soon became clear to banks as well. They realized that a battle would ensue over who could secure the aliases, and that aliases would become a strategic factor of switching costs.

The initial swell toward registering aliases actually came from FinTechs, just as the banks had feared. Young tech-savvy companies were able to adapt to the swiftly changing needs of the populace, and were able to dispatch attractive alias registration techniques. Rather than viewing Pix as a competitor, FinTechs saw it as an opportunity at last to level the playing field and chip away at the margins held by large banks. By getting in on the action early, FinTechs recognized the chance to compete with incumbents in parity of arms. The easy uptake and interchangeability of providers to the Pix rails for users meant that service would be king; no longer could an entity force users to remain within its pipeline by offering a subpar experience or predatory set of rates.

Prior to the transactional account onboarding process, the BCB announced which market participants had mandatory membership. These participants would be compelled by the BCB's strong governmental mandate to join Pix. The BCB identified 35 mandatory participants that together constituted 90% of all transactional accounts in the country. De Mello recounted that the BCB had them join by saying essentially, "You're regulated entities; if you don't comply, there will be serious consequences." Owing not just to the mandate but also to the dramatic effectiveness of the alias registration process, banks realized that the BCB had made good on its word (see **Exhibit 4** for details). As such, they decided to make the most out of it. In terms of the logistics of cash, they realized it would save them money in the long run. Furthermore, the trend toward instant payments was happening globally, not just in Brazil. There was a sense that their proliferation was, overall, inevitable.

Adoption, Uses, and Centralized Advantages

The change in attitude ignited rapid strides toward the Pix registration end-goal. Leading up to Pix's launch, the BCB, the mandatory participants, and the other cooperating entities registered 73 million keys. Those keys signified 32 million different consumers, and an additional 2 million different companies. Pix had done what was though impossible: it had on-boarded 1/3rd of the banked population in just one month.

The Pix Team believed in the importance of specifying all that Pix could be, while at the same time designating exactly what it could not be. Neither Pix nor the BCB would be in the business of providing a state-owned company servicing end users. The mission would be solely to provide infrastructure for banks, credit unions, FinTechs, and other participants who could use that infrastructure to provide services. Pix would operate at marginal cost, which was as close to 0 as had ever been seen in the country: for every usage of Pix, there was a charge of 1/10th of 1 cent of 1 Brazilian real, or approximately 1/50th of 1 cent of 1 USD.

The necessary infrastructure for end-users, particularly cell phones and especially smartphones, was increasingly accessible even to the people at the lower end of the income distribution. Mobile penetration in Brazil stood at 67% in 2020, up from 54% in 2015. Over half of all Brazilian adults had smartphone access, and the mobile growth rate was 1.75 times that of GDP. De Mello knew that Pix would coevolve with mobile proliferation, and that the latter had to be closely monitored.

In terms of future success, De Mello considered that Pix could go on to become a massive disruptor to the plastics industry. He already could see it as a likely candidate for substituting all other bill pay methods entirely due to its simplicity alone. Pix was flexible, and could be adopted for the gamut of use cases, including P2P, P2B, B2B, and P2G. While Pix could not provide embedded credit products as certain plastics could, De Mello speculated that banks and creditors might still have an interest in running on Pix rails since they would be cheaper than other established lines, such as those of Visa or Mastercard.

Decisions for the Pix Team

De Mello maintained that Pix had to be interoperable, open, and pro-competitive. Yet there were foreseeable events in its future that might call Pix's neutrality into question when considering what capabilities it might need to develop. As his first example, the BCB had already identified that standardizing APIs (Application Programming Interfaces) for retail payment would be ideal for the overall ecosystem. But who could decide how to standardize them? If they remained non-standardized, eventually retailers would likely connect with large banks to do the job while leaving others out. However, if the BCB standardized APIs directly, participants could argue it would be stifling API innovation.

De Mello did not view such an eventuality as having one solution. He preferred to view each option as having tradeoffs. Another perceived inevitability would be other sectors and institutions trying to join the Pix rails, with the healthcare industry already eyeing the efficiencies gained by migrating toward centralized processing. Who should decide which could join, and when? These questions lingered even for more familiar topics. Pix might one day host a bevy of features: cash back for retailers, QR codes for payers, nearfield communication, automatic debit—the list seemed interminable. At every point, there would be a tension with moving forward on additional capabilities versus holding fast and ensuring that everyone was satisfied and each part was properly in place. And what was BCB's role if a dominant/monopolist were to emerge in the space, and potential abuses of the payment system were suspected? Should BCB have the unilateral authority to shut them down? Could it afford not to?

Once Pix had everyone on its rails and the system had advanced to a 2.0 state of efficiency, it remained foggy for the Pix Team how the BCB would gauge its role in fostering or inhibiting payment innovation. Could a centralized scheme in principle be pro-competitive and pro-innovation in the long run? Or might there come a time for the BCB to declare its mission accomplished, and exit? After that first footfall, could it ever really exit? The world, especially the developing world, was watching Brazil.

De Mello's steps as he paced his office echoed loudly; so too did the movements of Pix resonate far beyond its footprints. Was he setting his country free tomorrow, or tying the hands behind its back?

Exhibit 1A Timeline of the BCB's Steps toward Financial Inclusion**BCB's steps toward financial inclusion (timeline of major steps; events starting in 2011)**

| | |
|------|--|
| 2011 | Launch of the National Partnership for Financial Inclusion (PNIF), a network of public and private actors aiming to assess the financial inclusion level and design policy measures. |
| 2012 | The 2012 central bank organization restructuring dedicated one deputy governor to coordinate the central bank's interaction with the public and financial-inclusion-related aspects. |
| 2013 | Law 12.865 was enacted, creating the payment institution framework. |
| 2015 | The focus on financial inclusion is redirected to the newly introduced financial citizenship concept. In addition to inclusion, it considers three other dimensions: financial education, consumer protection, and social involvement. |
| 2020 | Pix framework and open banking/finance initiatives |
| 2021 | Regulatory sandbox |

Source: BCB materials.

Exhibit 1B Basket of relevant economic indicators on financial inclusion, cash economy, the informal sector, and banked population

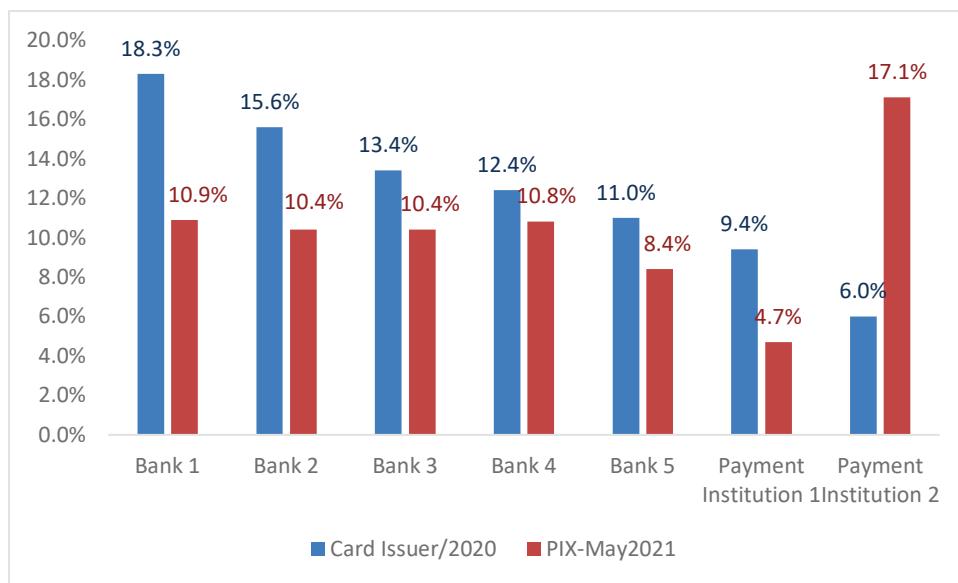
| Indicator | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| GDP at current prices in US\$ trillion | 2.61 | 2.46 | 2.47 | 2.45 | 1.80 | 1.80 | 2.06 | 1.92 | 1.88 | 1.44 |
| GDP per capita at current prices in US\$ | 13,298 | 12,422 | 12,342 | 12,169 | 8,827 | 8,774 | 9,976 | 9,190 | 8,933 | 6,819 |
| CPI inflation (IPC-A in 12 months, %) | 6.50 | 5.84 | 5.91 | 6.41 | 10.67 | 6.29 | 2.95 | 3.75 | 4.31 | 4.52 |
| Exchange rate - BRL/USD - end of period | 18,758 | 20,435 | 23,426 | 26,562 | 39,048 | 32,591 | 33,080 | 38,748 | 40,307 | 51,967 |
| Registered Employees Index | 173.52 | 179.82 | 185.05 | 186.98 | 179.93 | 173.84 | 173.79 | 176.30 | 179.25 | - |
| Currency issued (end-of-period balance) (B) | 162.77 | 187.43 | 204.05 | 220.85 | 225.49 | 232.15 | 250.36 | 264.97 | 280.69 | 370.44 |
| Population (M) | 196.6 | 198.3 | 200.0 | 201.7 | 203.5 | 205.2 | 206.8 | 208.5 | 210.1 | 211.8 |
| Holders of deposit accounts (M) | 87 | 92 | 90 | 91 | 87 | 79 | 101 | 103 | 102 | - |
| Holders of savings accounts (M) | 97 | 108 | 124 | 134 | 130 | 135 | 152 | 157 | 164 | - |
| In-person bank transactions (M) | 21.119 | 22.549 | 22.966 | 23.685 | 23.761 | 22.537 | 24.127 | 22.454 | 17.695 | - |
| Bank transactions in remote channels (M) | 14.389 | 17.961 | 21.576 | 25.98 | 31.694 | 38.081 | 46.164 | 51.929 | 57.849 | - |
| Credit card payments (M) | 3.836 | 4.473 | 5.02 | 5.367 | 5.56 | 5.858 | 6.388 | 7.424 | 9.931 | - |
| Debit card payments (M) | 3.508 | 4.129 | 4.908 | 5.627 | 6.21 | 6.837 | 7.934 | 9.023 | 10.88 | - |
| Number of checks (M) | 999 | 903 | 826 | 743 | 656 | 301 | 252 | 216 | 185 | - |
| Credit transfers (M) | 2.213 | 2.454 | 2.68 | 2.852 | 2.936 | 6.889 | 7.28 | 10.902 | 11.865 | - |

Source: BCB Materials.

Note: M = million, B = billion

Exhibit 2A Market Share of Largest Card Issuers

| Market Share - Largest Card Issuers/PIX | | |
|---|-------------------|----------------|
| | Card Issuer; 2020 | PIX; May, 2021 |
| Bank 1 | 18.3% | 10.9% |
| Bank 2 | 15.6% | 10.4% |
| Bank 3 | 13.4% | 10.4% |
| Bank 4 | 12.4% | 10.8% |
| Bank 5 | 11.0% | 8.4% |
| Payment Institution 1 | 9.4% | 4.7% |
| Payment Institution 2 | 6.0% | 17.1% |



Source: BCB Materials.

Exhibit 2B Margins on Transactions from Big Players

| Spread of the ICC | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Total (percentage points) | 11.47 | 11.5 | 12.7 | 14.11 | 13.84 | 13.52 | 14.38 | 11.81 |
| Individuals (percentage points) | 16.88 | 16.93 | 18.97 | 20.52 | 19.3 | 18.82 | 19.64 | 16.7 |

Source: BCB Materials.

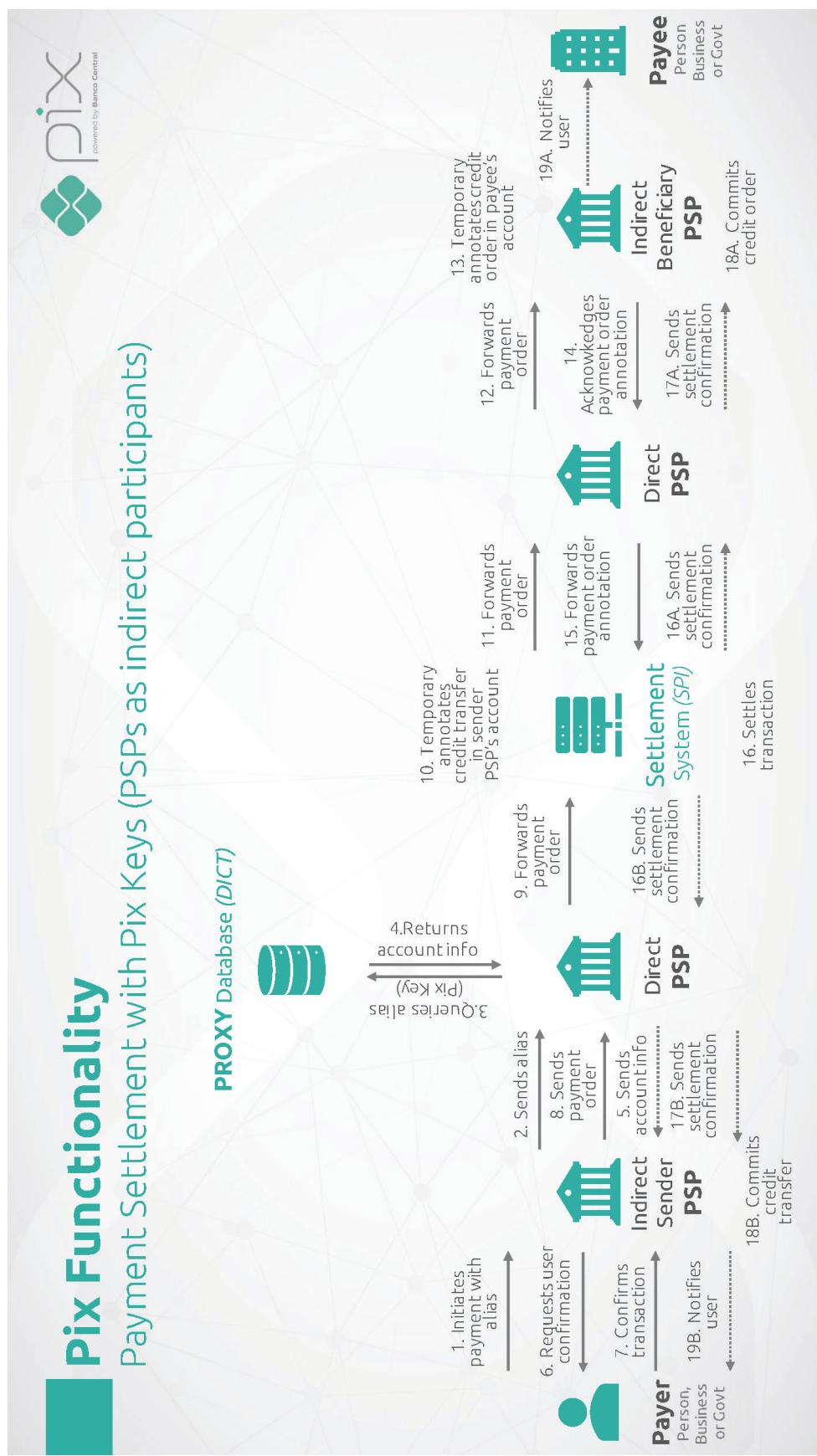
Note: ICC: Difference between average cost of outstanding loans (ICC) and its average funding cost.

Exhibit 3A Pix Functionality: Payment Settlement with Pix Keys



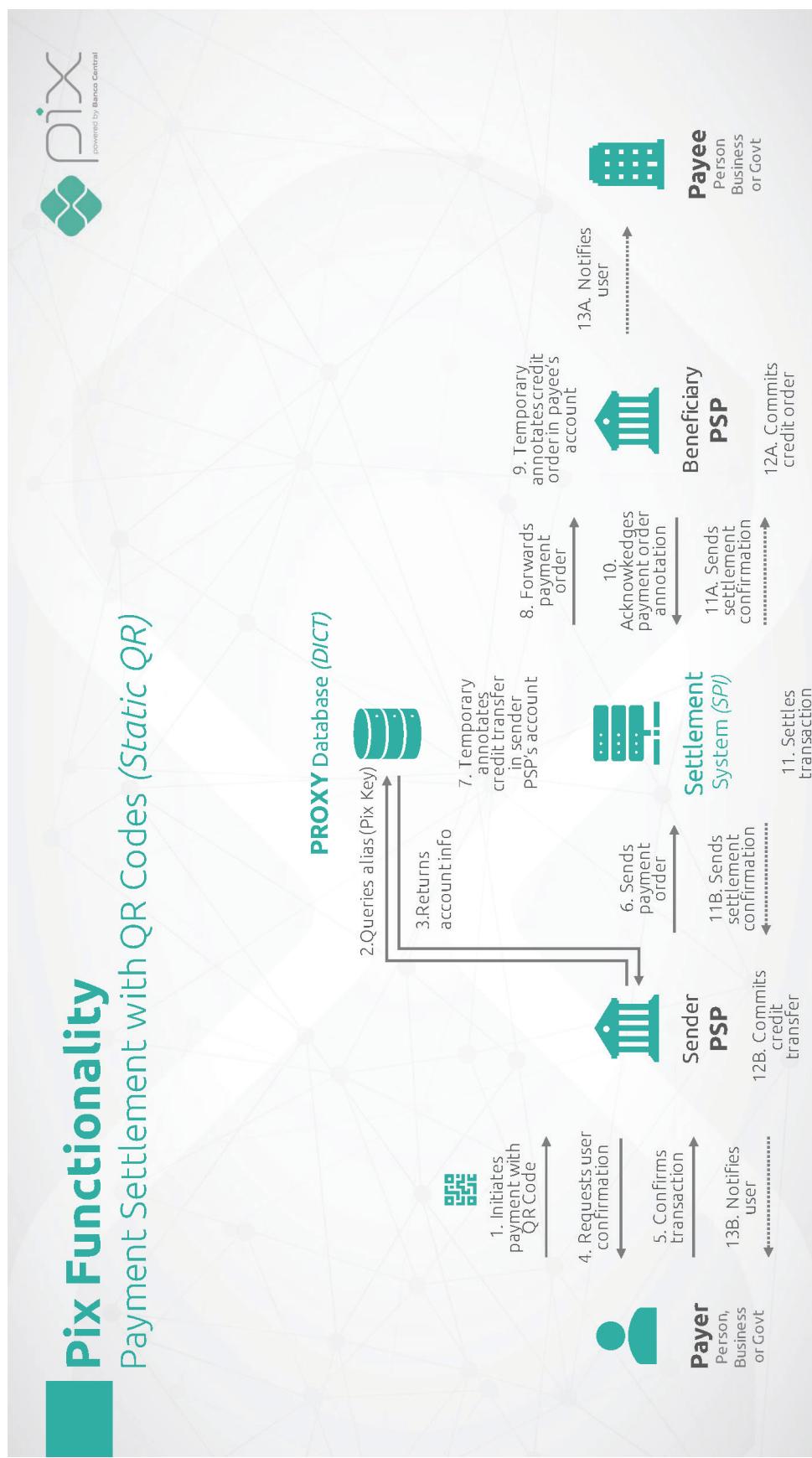
Source: BCB Materials.

Exhibit 3B Pix Functionality: Payment Settlement with Pix Keys (PSPs as Indirect Participants)



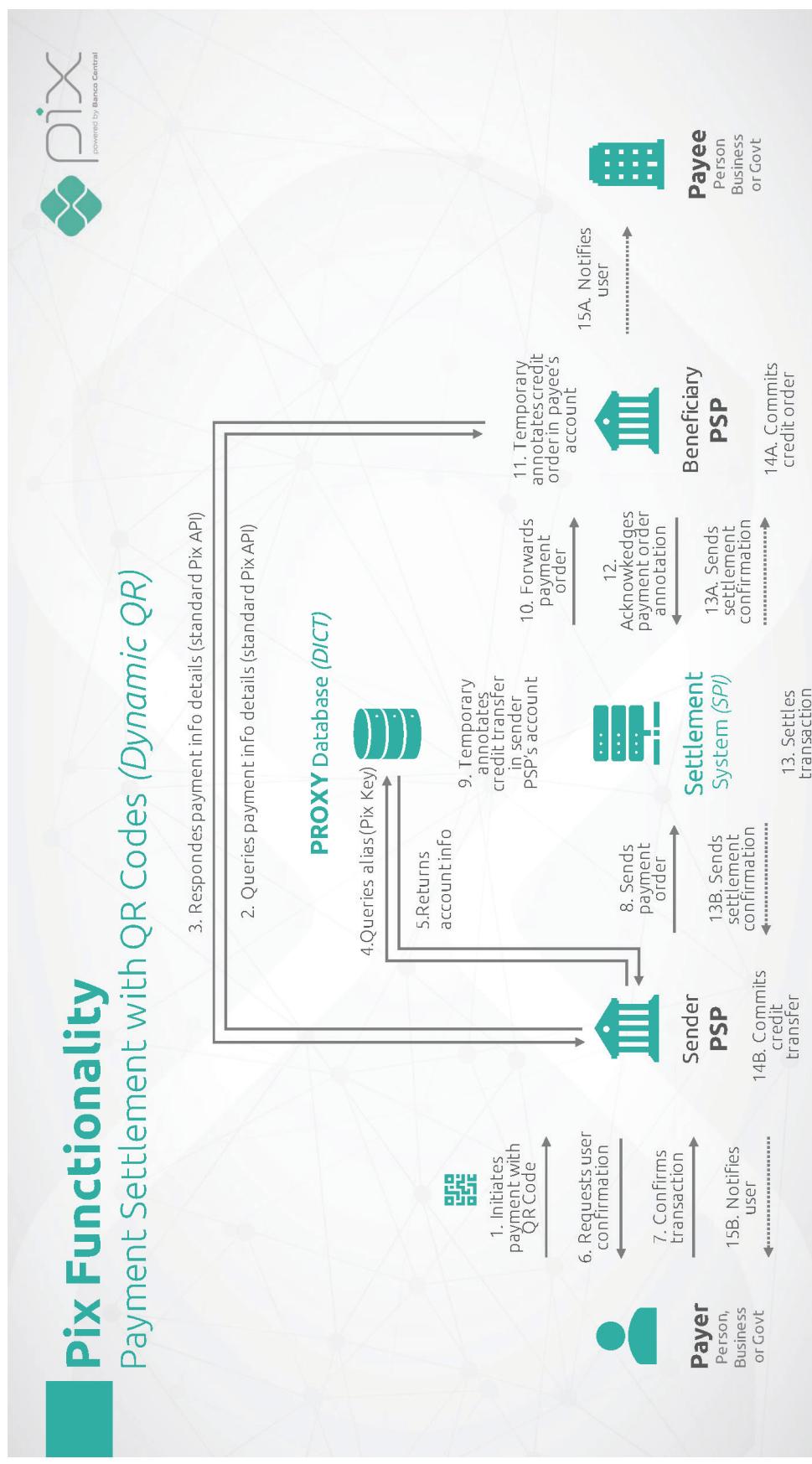
Source: BCB Materials.

Exhibit 3C Pix Functionality: Payment Settlement with QR Codes (Static QR)



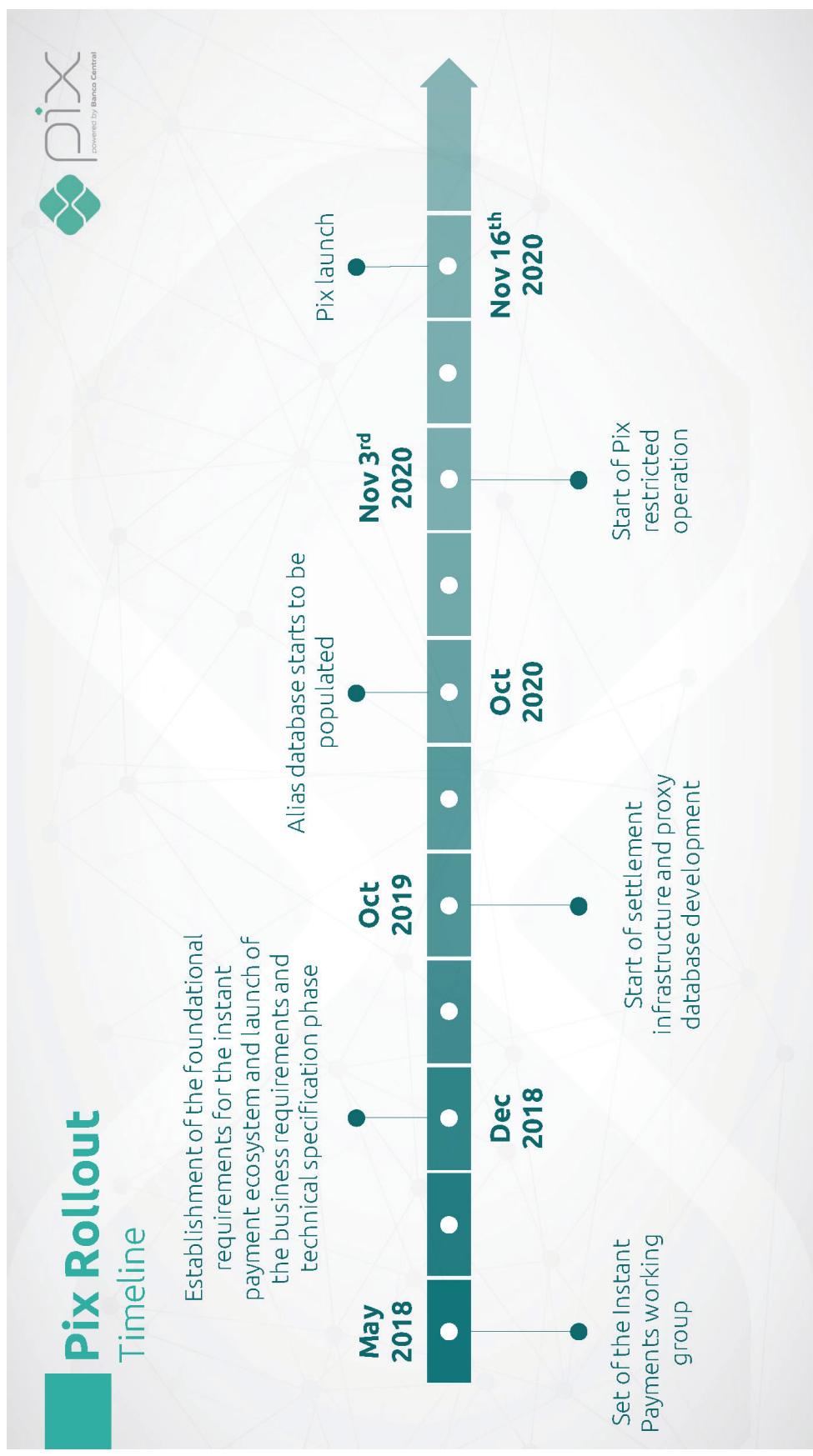
Source: BCB Materials.

Exhibit 3D Pix Functionality: Payment Settlement with QR Codes (Dynamic QR)



Source: BCB Materials.

Exhibit 4 Pix Rollout Timeline



Source: BCB Materials.