

Central Banks and Real-Time Payments: Lessons from Brazil's Pix

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Introduction

Real-time payments (RTP) are an increasingly popular means by which individuals can send credits from one account to another. Many banks have established internal RTP systems and, in some countries, these have been extended to other banks through private consortia such as The Clearing House in the United States. Such consortia enable someone with an account at Chase, for example, to send money to someone with an account at Wells Fargo, and vice versa, using their RTP apps.¹

In other countries, central banks have inhibited the establishment of private RTP networks and have developed their own systems. One such example is Brazil, where the Banco Central do Brasil (“BCB”) has operated the Pix instant-payment system since 2020.

The Bank for International Settlements (BIS), the Basel-based organization that sets regulatory standards for central banks, recently published a paper examining Pix that was co-authored by two researchers from the BCB and three from the BIS.² This brief offers some initial thoughts on that BIS paper and on the Pix system more generally.

We begin with a discussion of the economics of payment networks, with an emphasis on the optimal distribution of costs and benefits. Section II addresses cost transparency and apportionment in payment systems run by central banks. Section III critiques several mistaken notions regarding the role of rewards in payment-card networks. Section IV illustrates the conflicts of interest that can arise when a governmental entity such as a central bank competes with the private sector. Section V discusses the inter-related problems of data breaches, inadequate know-your-customer procedures among some Pix-implementing entities, and the phenomenon of “lightning kidnappings.” Section VI compares the operational rules governing the BCB with international good governance. Section VII concludes with a discussion of the wider lessons for governments considering the implementation of RTP systems.

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¹ RTP Network Participating Financial Institutions, THE CLEARING HOUSE, <https://www.theclearinghouse.org/payment-systems/rtp/rtp-participating-financial-institutions> (last visited May 18, 2022).

² Angelo Duarte et al., *Central Banks, the Monetary System and Public Payment Infrastructures: Lessons from Brazil's Pix*, BIS BULLETIN NO. 52 (Mar. 23, 2022), at 1.

I. Misrepresenting Payment-Network Costs and Benefits

In the BIS report on Pix, Duarte et al. state:

[D]espite rapid technological progress in information processing and digital technology in recent decades, the cost of domestic payments has remained stubbornly high. Credit and debit card fees, usually levied on merchants, exceed 1% of GDP in many economies and can be substantially higher in some cases (Alfonso et al. (2020)). While these costs are not directly visible to consumers (as they are levied on merchants), they are partially passed on to consumers through higher prices at the checkout. As in the case of indirect taxation, the group that ultimately bears the tax burden may differ from the group that is formally required to pay the tax. Ultimately, these costs can act as a drag on economic activity.

In a manner emblematic of the entire paper, this paragraph offers select details about the costs of operating payment networks, presented in a way that could easily mislead a reader. While it is true that card fees charged to merchants can be significant, presenting them as a percentage of GDP may lead readers to the incorrect conclusion that they impose a net economic cost, especially given the assertion that “these costs can act as a drag on economic activity.”

It is now well-established that payment networks are two-sided markets, with consumers on one side and merchants on the other side. In such markets, it is common for one side of the market to “subsidize” the other side.³ Consider newspapers: on one side are consumers and on the other are advertisers. Newspapers serve as intermediaries between these two sides by offering content that is attractive to a specific set of consumers. The size and makeup of a newspaper’s readership, meanwhile, affects its attractiveness to advertisers. With a sufficiently large and relevant readership, advertisers can become the main source of revenue for newspapers; in some cases, they are the only source.

A key determinant of whether one side of a market subsidizes the other is the relative price sensitivity of participants on each side (known in economics jargon as price elasticity of demand). In the case of newspapers, advertisers are less price-sensitive than readers (especially in this era of freely available online content), which is why advertisers effectively subsidize readers.

In the context of payment cards, merchants are generally less price-sensitive than consumers, so we would expect them to subsidize consumer access to payment cards. In most cases, indeed, that is precisely what they do, via the interchange fees charged by issuers. Such cross-subsidies enable card issuers to offer better terms to cardholders than would otherwise be the case. Thus, for example, credit-card issuers can use interchange-fee revenue to offer more favorable terms, such as lower interest rates and/or rewards to customers with adequate credit ratings. This encourages more people to keep and use credit cards. Likewise, banks are able to use interchange fees earned from

³ See Julian Morris, Todd J. Zywicki, & Geoffrey A. Manne, *The Effects of Price Controls on Payment-Card Interchange Fees: A Review and Update*, INTERNATIONAL CENTER FOR LAW & ECONOMICS, at 4 (Mar. 4, 2022), available at <https://laweconcenter.org/wp-content/uploads/2022/03/Payments-2021-Lit-Review.pdf>.

debit cards to offset other costs, enabling them to provide free or lower-cost checking accounts, which in turn encourages more consumers to open bank accounts and use debit cards.

It is also worth noting that interchange fees are not the only cost incurred by merchants in a card-payment transaction. The merchant's acquirer also charges a fee. Indeed, the merchant often only sees the total fee charged by the acquirer (called the "merchant discount rate" in the United States and the "merchant service charge" in most other countries), which combines the interchange fee (paid to the issuer) and the acquiring fee (kept by the acquirer). The fees charged by acquirers enable them to provide the infrastructure needed to facilitate point-of-sale transactions. When a merchant chooses to enter into an agreement with an acquirer, it presumably believes that the resultant agreement will generate a net benefit to the merchant.

The number of merchants entering into such agreements has been increasing for decades almost everywhere, including in Brazil. Given that, it would appear reasonable to conclude that such agreements generate net benefits to merchants. This all matters, because increased access to credit cards and bank accounts both increase financial inclusion and, combined with the widespread acceptance of card payments, have broad economic benefits.

As such, it is rather odd that Duarte et al. assert that "these costs can act as a drag on economic activity."⁴ Indeed, one wonders: compared to what? One important comparison is, of course, cash. As Todd Zywicki, Geoffrey Manne, and I wrote in 2014:⁵

Ubiquitous use of payment cards has reduced liquidity and other constraints that previously limited consumer purchases to the amount of money in their wallet. Both consumers and merchants benefit: consumers by being able to make purchases that otherwise wouldn't have been possible and merchants by making sales that otherwise wouldn't have happened. These benefits result primarily from three factors:

1. Ticket lift: merchants' "ticket lift" occurs because consumers are not constrained in making purchases by the amount of money in their wallet (or the need to make a trip to the bank or cash machine). This relaxation of liquidity constraints benefits merchants significantly—for example, short-term sales and special discounts will be more effective if consumers are not limited by their cash on hand.
2. Faster throughput & greater efficiency: For a significant range of transaction sizes, payment cards enable businesses to process transactions more rapidly than cash and other payment methods; for many transactions, payment cards are approximately twice as fast as cash (and cheques are even slower). At the same time, the infrastructure required to support electronic payments is less cumbersome, piggybacks in part on existing communications networks, and reduces the need for physical security of currency (e.g., armored cars and safes).

⁴ Duarte et al., *supra* note 2, at 3.

⁵ Todd J. Zywicki, Geoffrey A. Manne & Julian Morris, *Price Controls on Payment Card Interchange Fees: The U.S. Experience*, GEO. MASON L. & ECON. RSCH. PAPER No. 14-18 (2014), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2446080.

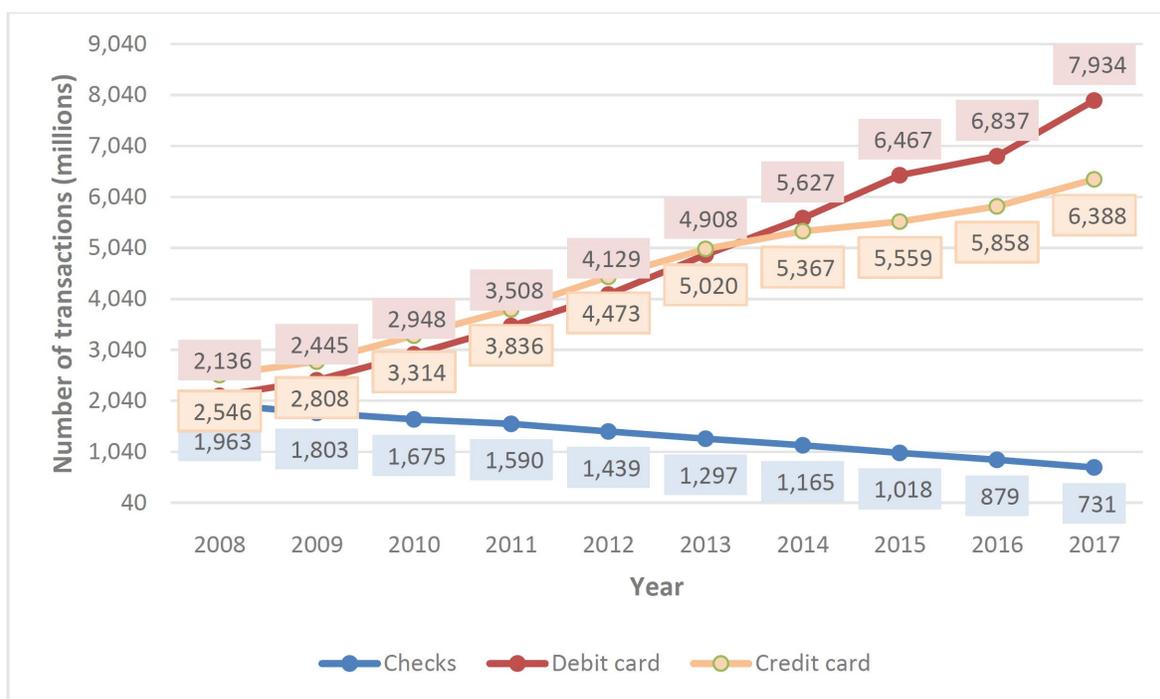
3. Outsourcing of credit risk: Credit cards enable retailers to offload the cost and risk of offering their own credit operations. This has enabled small businesses to flourish and grow, enabling them to compete with larger companies without the need to run their own, expensive credit operations.

When all of these benefits to merchants are taken into account, payment cards are likely less costly for merchants than cash for a wide range of transactions.⁶

Similarly, both credit and debit cards have advantages as payment methods over the use of checks. Most notably, they save time at checkout and avoid the risk of checks bouncing. Reflecting this, between 2008 and 2017, Brazil saw a massive shift away from checks and toward the use of payment cards, as demonstrated in Figure 1.

As such, rather than the “stubbornly high” cost of payment cards being “partly passed on to consumers through higher prices at the checkout,” it would be more accurate to talk about interchange fees as facilitating financial inclusion and generating savings that may be passed on to consumers in the form of lower prices of goods and services. In general, it is more accurate to describe payment cards as a promoter of economic activity, rather than a drag.

FIGURE I: Number of Transactions in Brazil by Payment Method, 2008-2019



Source: *Digital Disruption in Financial Markets – Note by Brazil*⁷

⁶ *Id.* at 2.

⁷ *Digital Disruption in Financial Markets – Note by Brazil*, OECD, June 5, 2019. [https://one.oecd.org/document/DAF/COMP/WD\(2019\)34/en/pdf](https://one.oecd.org/document/DAF/COMP/WD(2019)34/en/pdf).

II. Cost Transparency and Financial Inclusion

Duarte et al. also fail to mention that many of the costs of the Pix system are hidden from both merchants and consumers. These include the costs of several “complementary policies” implemented by the BCB, such as:

[T]o support public awareness and adoption, the BCB ran an extensive communication strategy with PSPs [payment service providers], individuals, businesses, media and other stakeholders. The rollout required complementary policies to increase digital literacy, particularly for the most disadvantaged and for older users, who are less comfortable making digital payments. From an infrastructure perspective, the massive adoption of Pix required additional IT resources at the BCB.⁸

We are not told how the BCB covered the costs of these “complementary policies,” whether they were recouped from fees paid by merchants accepting Pix, additional fees levied on banks, or covered by the federal government (i.e., taxpayers).

Duarte et al. note that “the BCB mandated participation in Pix of banks and other payment institutions with more than 500,000 transaction accounts.”⁹ They assert that this “created a critical mass of users” and note that “[a]s banks saw their competitors taking part, they were incentivized to join the network.”¹⁰ The impression presented by the BIS report is that mandatory participation generated positive net benefits.

It is not, however, at all obvious that this is the case. Larger banks had to be forced to participate, suggesting that there are significant costs to participation. The incentives smaller banks faced may also have been negative, rather than positive. Namely, they may have been motivated to offer Pix because of the threat that customers would move to larger, regulated banks that were forced to be part of the system. In other words, it is quite possible—even probable—that banks and other payment institutions have been forced—either directly by the BCB or indirectly by customers who feel obliged to use Pix—to incur substantial costs to implement Pix.

One source of such costs is the loss of interchange revenue that would have accrued to issuers from person-to-business (“P2B”) payment-card transactions, which represent 20% of Pix transactions. While Duarte et al. make much of the “savings” to merchants from consumer use of Pix, they ignore entirely the effect this might have on financial inclusion. Several studies have shown that the revenue losses banks suffer due to price controls on interchange fees are typically passed on to consumers in the form of other fees.¹¹ In the case of credit cards, issuers typically reduce rewards and increase

⁸ Duarte et al., *supra* note 2, at 7.

⁹ *Id.* at 7.

¹⁰ *Id.* at 7.

¹¹ Juan Iranzo, Pascual Fernández, Gustavo Matias, & Manuel Delgado, *The Effects of the Mandatory Decrease of Interchange Fees in Spain*, MUNICH PERSONAL REPEC ARCHIVE, MPRA Paper No. 43097, (October 2012), available at https://mpra.ub.uni-muenchen.de/43097/1/MPRA_%20paper_43097.pdf; Benjamin S. Kay, Mark D. Manuszak, & Cindy M. Vojtech, *Competition and Complementarities in Retail Banking: Evidence From Debit Card Interchange Regulation*, 34 J. FIN. INTERMEDIATION

annual fees.¹² In the case of debit cards, issuers typically increase fees on bank accounts, reduce the availability of free accounts, and raise the minimum average deposit amount required to maintain a free account.¹³ On balance, such price controls tend to reduce access to credit and to banking in general, especially for poorer consumers.

In the short term, Brazil partly overcame this issue by distributing both emergency relief tied to the COVID-19 pandemic and payments from the Bolsa Familia social-welfare program via Pix, thereby creating incentives for many poorer Brazilians to establish an account with a payment-service provider (“PSP”) and receive funds electronically.¹⁴ However, such solutions are unlikely to be sustainable in the longer term and do not create incentives for the poorest Brazilians to become part of the formal banking system through which they can borrow and save at favorable rates. It would be both ironic and terribly sad if one consequence of Pix is that it makes it more difficult for the poor to participate in the formal banking system.

III. Network Effects, Strawmen, and the Reverse Robin Hood Effect

Duarte et al. assert that:

Progress in technology has been no panacea for the problems of payment costs and financial inclusion. The network effects inherent in payment platforms can be used to entrench market power and can often result in a lack of effective competition. Big tech payment services can quickly gain substantial market power to extract high fees and valuable data (Carstens et al. (2021)). In many economies, there is also the market dominance of the major banks together with card networks that enjoy substantial rents. Some of these rents are passed back to customers, for instance through points or benefits on credit cards, but the customers who benefit are frequently the “high-value” customers who are not financially excluded.¹⁵

91, 92 (2018); see also Vladimir Mukharlyamov & Natasha Sarin, *Price Regulation in Two-Sided Markets: Empirical Evidence From Debit Cards*, working paper (December 2019) (estimating \$5.5 billion annual revenue loss to banks from interchange-fee reductions); Bradley G. Hubbard, *The Durbin Amendment, Two-Sided Markets, and Wealth Transfers: An Examination of Unintended Consequences Three Years Later*, working paper (May 20, 2013), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2285105, at 20 (estimating annual revenue loss of \$6.6 billion to \$8 billion from the Durbin amendment); *Interchange Fee Regulation Impact Study*, EDGAR DUNN & CO., (April 2020), available at <https://edgardunn.com/wp-content/uploads/2020/04/Interchange-Fee-Regulation-Impact-Study-EDC-v1.1.pdf>.

¹² Iranzo, et al., *supra* note 11 at 34-37; Ian Lee, Geoffrey A. Manne, Julian Morris, & Todd J. Zywicki, *Credit Where It's Due: How Payment Cards Benefit Canadian Merchants and Consumers, and How Regulation Can Harm Them*, MACDONALD-LAURIER INSTITUTE (2013), at 27; Julian Morris, Todd J. Zywicki, and Geoffrey A. Manne, *The Effects of Price Controls on Payment-Card Interchange Fees: A Review and Update*, INTERNATIONAL CENTER FOR LAW AND ECONOMICS, ICLE White Paper 2022-03-04 (Mar. 4, 2022), at 23-29.

¹³ Todd J. Zywicki, Geoffrey A. Manne, & Julian Morris, *Unreasonable and Disproportionate: How the Durbin Amendment Harms Poorer Americans and Small Businesses*, INTERNATIONAL CENTER FOR LAW AND ECONOMICS, (Apr. 25, 2017); Todd J. Zywicki, Geoffrey A. Manne, & Julian Morris, *Price Controls on Payment Card Interchange Fees: The U.S. Experience*, GEORGE MASON LAW & ECONOMICS RESEARCH PAPER NO. 14-18, (Jun. 6, 2014).

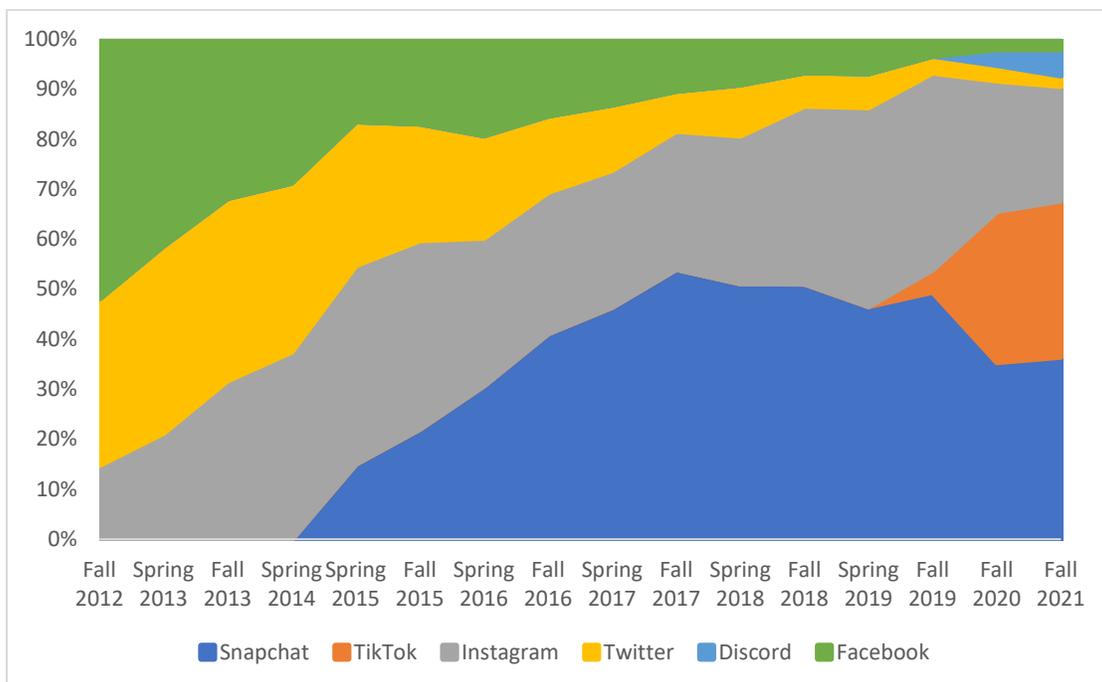
¹⁴ Eduarda Andrade, *CAIXA Tem Libera Transferência do Auxílio e Bolsa Família por PIX e TED*, FDR.COM.BR (Aug. 18, 2021).

¹⁵ Duarte et al., *supra* note 2, at 4.

While progress in technology obviously has not *eliminated*, “the problems of payment costs and financial inclusion,” it *has* resulted in widespread improved access to payment technologies, reduced acquiring fees (as Duarte et al. acknowledge a few paragraphs later), and improved fraud detection and prevention.¹⁶

The next two sentences in that paragraph reflect generalized fears of “Big Tech” and the allegedly overwhelming nature of network effects. While it is true that various online services may garner significant market share over the short term, they can also lose market share very quickly when superior alternatives arise. Consider the rise and fall in popularity of various social networks among U.S. teens and young adults, as demonstrated in Figure 2.

FIGURE 2: Most Popular Social Networks Among US Teens and Young Adults



Source: Statista¹⁷

This is a reminder that the companies currently considered “Big Tech” were, until relatively recently, disruptive outsiders that achieved their significant market share by building products that consumers want. Those that have maintained market share are constantly adapting those products to the

¹⁶ Tim Maxwell, *How Major Credit Card Networks Protect Customers Against Fraud*, BANKRATE.COM (Jun. 8, 2021) <https://www.bankrate.com/finance/credit-cards/major-credit-card-networks-protect-against-fraud>.

¹⁷ *Most Popular Social Networks of Teenagers in the United States from Fall 2012 to Fall 2021*, STATISTA (Mar. 28, 2022), <https://www.statista.com/statistics/250172/social-network-usage-of-us-teens-and-young-adults>.

expressed needs of consumers. It is simply incorrect that these companies have “market power” that enables them “to extract high fees and valuable data.”¹⁸

The concerns expressed by the BIS report’s authors regarding card networks enjoying “rents”—and some consumers sharing in the spoils through rewards programs (the so-called “Reverse Robin Hood Problem”)—betray a misunderstanding of the nature of two-sided markets. It is now well-established that interchange fees are the mechanism that payment networks use to optimize participation.¹⁹ Rewards are one mechanism used to increase participation. But as Ben Sperry, Todd Zywicki, and I demonstrate in a recent study,²⁰ rewards do not disproportionately benefit “high value” customers.

Meanwhile, quite obviously, an individual who has a debit or credit card is by definition “not financially excluded” regardless of whether or not that card provides rewards. But to the extent that a consumer who previously did not have a debit or credit card chooses to obtain one, in part, because of the rewards that card offers, it would be accurate to say that the rewards have increased their degree of financial inclusion.

IV. Competition and Conflicts of Interest

Duarte et al. note that, in Brazil, digitalization of retail payments “gathered pace after the adoption of a 2013 law that gave the Central Bank of Brazil (BCB) competence to regulate retail payments according to the principles of efficiency, security, interoperability and financial inclusion.”²¹ Of course, this does not, however, establish that digitalization was *caused by* adoption of the 2013 law. Indeed, digitalization of retail payments gathered pace in many countries after 2013. This would suggest that technological innovation was likely the primary driver, not necessarily any change in Brazil’s regulatory framework, per se. It is notable, for example, that PicPay, Brazil’s most popular private mobile-payment system, was founded and piloted in 2012—the year before the reforms.²²

To the extent that the 2013 reform removed barriers to implementing mobile-payment systems or offered clarity as to the nature of the regulations, it may have helped to stimulate investment in new systems. But it would appear that BCB regulations continue to affect access to a diverse array of payment technologies in Brazil negatively.

Case in point: In June 2020, a coalition of payment networks (Mastercard, Visa), banks (Cielo, Banco do Brasil, Sicredi, Nubank), and Facebook announced the launch of a pilot digital-payment solution operating over the Facebook (now Meta) messaging service WhatsApp. About a week later,

¹⁸ Geoffrey A. Manne & Justin Hurwitz, *Big Tech’s Big-Time, Big-Scale Problem*, 40 CATO POL’Y REP. 5 (2018).

¹⁹ Julian Morris, Todd J. Zywicki, and Geoffrey A. Manne, *The Effects of Price Controls on Payment-Card Interchange Fees: A Review and Update*, INTERNATIONAL CENTER FOR LAW AND ECONOMICS, ICLE White Paper 2022-03-04 (Mar. 4, 2022).

²⁰ Todd J. Zywicki, Ben Sperry & Julian Morris, *Credit Cards and the Reverse Robin Hood Fallacy: Do Credit Card Rewards Really Steal from the Poor and Give to the Rich?*, GEO. MASON L. & ECON. RSCH. PAPER No. 21-41 (2014).

²¹ Duarte et al., *supra* note 2, at 4.

²² Marcella McCarthy, *PicPay, the Brazilian Mobile Payments Platform, Files for an IPO on Nasdaq*, TECHCRUNCH (Apr. 22, 2021), <https://techcrunch.com/2021/04/22/picpay-the-brazilian-mobile-payments-platform-files-for-an-ipo-on-nasdaq>.

BCB issued a new rule requiring any new payment scheme that “poses risk to the normal operation of retail payment transactions” to be approved by the BCB before it could be marketed.²³ The BCB then immediately used this new rule to force the suspension of the new WhatsApp payment service, claiming that it was necessary to “preserve an adequate competitive environment” for mobile payments and to ensure the “functioning of a payment system that’s interchangeable [presumably this means interoperable], fast, secure, transparent, open and cheap.”²⁴ Forcibly removing a competitor would appear an odd way to preserve “an adequate competitive environment.” Moreover, it is not clear that the WhatsApp system violated those obligations.

Duarte et al. note that “By coincidence, the launch of Pix was preceded in June 2020 by the launch of a big tech payment service that proposed merchant fees of 3.99%.”²⁵ In a footnote, they add that:

BCB and competition authority CADE moved to suspend these payments, noting that they departed on prior authorization... In the interim, the BCB has authorised person-to-person payments by the provider on Pix. The firm is implementing changes to fulfil BCB requirements for a person-to-business payments model.²⁶

When the WhatsApp service originally launched, however, it did not charge for P2P transactions.²⁷ It appears likely that the consortium behind the WhatsApp service intended to use revenues from P2B transactions to subsidize P2P transactions, which would have encouraged widespread and rapid adoption.

Given that Pix was launched in November 2020, the timing of the WhatsApp suspension is rather suspicious. Moreover, the decision to suspend WhatsApp was made by the same division of the BCB responsible for launching Pix, and which also happened to be headed by the lead author of the BIS paper, Angelo Duarte.²⁸

V. Know Your Criminals

Another concern with Pix is its security flaws. Duarte et al. assert that:

To ensure access and integrity, PSPs must digitally verify the identity of users. With the existing interface and know-your-customer (KYC) processes provided by their bank or

²³ BCB, Circular BACEN/DC No. 4031 OF 06/23/2020, <https://www.legisweb.com.br/legislacao/?id=397401>.

²⁴ Manish Singh, *Brazil Suspends WhatsApp’s Payments Service*, TECHCRUNCH (Jun. 24, 2020), <https://techcrunch.com/2020/06/23/brazil-orders-to-suspend-whatsapp-pay-week-after-rollout>.

²⁵ Duarte et al., *supra* note 2, at 4.

²⁶ *Id.* at note 3.

²⁷ Singh, *supra* note 21.

²⁸ *Diretor do BC Diz Que os Meios de Pagamento Sao a Forma Mais Tempestiva de se Monitorar a Economia* [BC Director Says that Means of Payment Are the Most Timely Way to Monitor the Economy], MERCADO & CONSUMO (Oct. 3, 2020), <https://mercadoconsumo.com.br/2020/10/03/diretor-do-bc-diz-que-os-meios-de-pagamento-sao-a-forma-mais-tempestiva-de-se-monitorar-a-economia>.

non-bank PSP, users can have an “alias” – such as a phone number, email address or other key – which forms the basis of digital identification.²⁹

While that description might offer the impression that Pix has in place robust know-your-customer (KYC) procedures, as the BIS report notes, Pix’s KYC process is entirely dependent on the KYC procedures of the PSPs. Unfortunately, some of the more than 700 smaller PSPs appear to have inadequate KYC procedures that enable criminals to sign up using false identities.³⁰

Duarte et al. note that “While Pix has multiple layers of security, efforts have also been necessary to prevent fraud and scams.”³¹ And yet, “non-adherence to required security standards by some small PSPs allowed access by third parties to some alias data. As with other digital payment instruments, this has required further efforts by the regulator and private PSPs to adapt and ensure safety.”³²

In the past eight months, there have been three reported data breaches relating to Pix accounts. The first, in late September 2021, resulted in the theft of information from nearly 400,000 Pix users due to a systems failure at state-owned Bank of the State of Sergipe (Banese).³³ The second breach occurred in late January 2022 and involved the theft of data relating to approximately 160,000 Pix users from Acesso Pagamentos.³⁴ The third breach, reported in February 2022 but relating to an incident in early December 2021, involved the theft of data from around 2,100 Pix users from LogBank.³⁵

BCB has sought to downplay the severity of these data breaches. For example, in response to the Banese breach, it asserted that “Sensitive data, such as passwords, information on transactions or financial balances in transactional accounts, or any other information under bank secrecy were not exposed. The information obtained is of a cadastral nature, which does not allow the movement of resources, nor access to accounts or other financial information.”³⁶ Yet, Banese itself noted that the data included “names, social security numbers, names of the bank where the key is registered, bank

²⁹ Duarte et al., *supra* note 2, at 5.

³⁰ Marina Gil, Pix: *Vulnerabilities in the System and How to Mitigate Such Risks*, AMERICAS MARKET INTELLIGENCE (Feb. 9, 2022) <https://americasmi.com/insights/pix-vulnerabilities-in-the-system-and-how-to-mitigate-such-risks>.

³¹ Duarte et al., *supra* note 2, at 7.

³² *Id.* at 7.

³³ Angelica Mari, *Brazilian Data Protection Authority Investigates First PIX Data Leak*, ZDNET (Oct. 6, 2021), <https://www.zdnet.com/article/brazilian-data-protection-authority-investigates-first-pix-data-leak>; see also Larissa Garcia and Alvaro Campos, *New Leak Threatens Pix’s Credibility Central Bank Reports a Third Hacker Attack in Six Months, Now With 2,112 Keys Exposed*, VALOR INTERNATIONAL (Feb. 3, 2022).

³⁴ Gabriel Shinohara, *Banco Central Comunica Vazamento de Dados de 160,1 Mil Chaves Pix da Acesso Pagamentos Segundo o BC, Não Houve Vazamento de Dados Sensíveis Como Senhas e Saldos*, O GLOBO (Jan. 21, 2022) <https://oglobo.globo.com/economia/banco-central-comunica-vazamento-de-dados-de-1601-mil-chaves-pix-da-acesso-pagamentos-25362574>.

³⁵ Fernanda Capelli, *Central Bank Confirms Another Leak of Pix Keys from Logbank*, PROGRAMADORES BRASIL (Feb. 4, 2022) <https://programadoresbrasil.com.br/en/2022/02/see-central-bank-confirms-yet-another-logbank-pix-key-leak>.

³⁶ BCB, *BC Comunica Ocorrência em Instituição Financeira*, BANCO CENTRAL DO BRASIL (Sep. 30, 2021) <https://www.bcb.gov.br/detalhenoticia/17523/nota>.

branches, bank account numbers, and other technical data used for anti-fraud control purposes.”³⁷ Meanwhile, in response to the third breach, BCB President Roberto Campos Nieto is reported to have said that such breaches will occur “with some frequency.”³⁸

The context in which these data breaches occurred is important. The first breach came a few weeks after Pix capped the value of P2P transactions made between the hours of 8 p.m. and 6 a.m. to R1,000 (\$182, at the time).³⁹ That cap was put in place following a 40% rise in the phenomenon of “lightning kidnappings,” in which the kidnappers coerced their victims to make a Pix transfer in order to be released.⁴⁰

One concern is that criminals may be seeking to use data gathered from the account breaches to create fake accounts in the names of real people, which they could then use to receive funds from the hostages they kidnap and/or engage in other criminal activities. They could then launder the money by using Pix to buy goods and, after depleting the account, destroy the phone used to create it. Given these concerns, it is perhaps not surprising that, in December 2021, the Legislative Assembly of the State of São Paulo put forward a bill that, if enacted, would suspend Pix operations within the state until the BCB puts in place improved security measures.⁴¹

Some Brazilians are taking matters into their own hands, responding to the threat of Pix kidnappings by purchasing secondary “Pix phones.”⁴² Users load these mid-range Android phones with banking and Pix apps and leave them at home. Meanwhile, they delete all banking apps from their primary phone. While such an approach allows those who can afford a second phone to prevent criminals from stealing potentially large amounts of money, it is quite a costly solution.

³⁷ Alessio de Oliveira Rezende, *Comunicado do Mercado*, BANCO DO ESTADO DE SERGIPE S.A. (Sep. 30, 2021) <https://ri.banese.com.br/noticia/banese-comunicado-ao-mercado-15>.

³⁸ George, *Pix Data Leaks Will Occur Frequently, Says BC president*, NEWSBULLETIN247 (Feb. 11, 2022) <https://newsbulletin247.com/economy/46687.html>.

³⁹ *Id.*

⁴⁰ Bryan Harris, *Brazil's Criminals Turn to Flash Kidnapping as They Take Advantage of New Tech*, FINANCIAL TIMES (Sep. 3, 2021) <https://www.ft.com/content/225fd97c-ef82-4dfa-b09b-97b1671e1e00>.

⁴¹ Angelica Mari, *Bill Proposes Suspension of Instant Payments in Brazilian State as Crime Surges*, ZDNET (Dec. 3, 2021) <https://www.zdnet.com/article/bill-proposes-suspension-of-instant-payments-in-brazilian-state-as-crime-surges>.

⁴² Alana Fernandes, “Brasileiros Estão Apostando no Celular do PIX,” EDITAL CONCURSOS BRASIL (May 21, 2022) <https://editalconcursosbrasil.com.br/noticias/2022/05/brasileiros-estao-apostando-no-celular-do-pix-entenda-o-que-e-e-como-usar>.

VI. Meeting International Standards of Good Governance

In a paper on central bank oversight of payment and settlement systems, the BIS's Committee on Payment and Settlement Systems noted that separation of functions should be a core principle for central banks:

A central bank needs to be clear when it is acting as regulator and when as owner and/or operator. This can be facilitated by separating the functions into different organisational units, managed by different personnel.⁴³

The reason to institute clear separation of regulatory from operational functions is to avoid the risk that the regulator may favor an in-house operator, either through leniency toward that operator, excessive zeal toward competitors, or both. Such policies are applied by several central banks, including those of the United States and Australia.⁴⁴

As it is presently constituted, the BCB does not comply with this core principle when it comes to payment networks. The same division of the BCB that operates Pix also regulates private competitor payment-service providers—including, as noted, the WhatsApp-based system.

Another closely related principle of good governance also practiced by several central banks that provide payment services—including those of the United States and Australia—is that the costs of the system should be recovered from users.⁴⁵ These costs should include not only the marginal costs to operate the system, but also the costs of capital deployed and any taxes that would have been paid had the services been provided by the private sector. The failure to price central-bank services in such a way causes distortions that impede private-sector innovation.

In addition to these primarily domestic concerns, Recommendation 10 of the Financial Action Task Force⁴⁶ (the international body that sets standards relating to money laundering and countering the financing of terrorism and proliferation, of which Brazil is a full member) states that “Financial institutions should be prohibited from keeping anonymous accounts or accounts in obviously fictitious names.”⁴⁷ Based on the above assessment, it would appear that the BCB may be contributing to violation of Recommendation 10.

⁴³ *Central Bank Oversight of Payment and Settlement Systems*, BANK FOR INTERNATIONAL SETTLEMENTS COMMITTEE ON PAYMENT AND SETTLEMENT SYSTEMS (May 2005) available at <https://www.bis.org/cpmi/publ/d68.pdf>.

⁴⁴ *Policies: The Federal Reserve in the Payments System*, BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM (January 2001) https://www.federalreserve.gov/paymentsystems/pfs_frpayssys.htm; *Managing Potential Conflicts of Interest Arising from the Bank's Commercial Activities*, RESERVE BANK OF AUSTRALIA (February 2022) <https://www.rba.gov.au/payments-and-infrastructure/payments-system-regulation/conflict-of-interest.html>.

⁴⁵ *Id.* and *Banking and Payment Services*, RESERVE BANK OF AUSTRALIA (2016) <https://www.rba.gov.au/publications/annual-reports/rba/2016/banking-and-payment-services.html>.

⁴⁶ *International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation*, FINANCIAL ACTION TASK FORCE, at 14 (March 2022), available at <https://www.fatf-gafi.org/media/fatf/documents/recommendations/pdfs/FATF%20Recommendations%202012.pdf>.

⁴⁷ *Find a Country*, FINANCIAL ACTION TASK FORCE, <https://www.fatf-gafi.org/countries> (last visited May 18, 2022).

VII. Conclusion: Questioning the 'Key Takeaways'

Returning to the beginning of the BIS paper, Duarte et al. offer three "key takeaways":

Public payment infrastructures build on the central bank's foundational role in the monetary system by promoting competition and interoperability between payment platforms. They can reduce costs for users and promote financial inclusion.

Brazil's recent experience with the Pix retail instant payment system illustrates the potential gains. In little over a year since its launch in November 2020, Pix has signed up 67% of adults in Brazil, with free payments between individuals and low charges for merchants.

The two key ingredients in the success of Pix are, first, the mandatory participation of large banks to kick-start network effects for users, and second, the central bank's dual role as infrastructure provider and rule setter.⁴⁸

Based on the concerns raised above, all of these "key takeaways" are highly questionable:

- It is possible that public-payment infrastructure might "build on a central bank's foundational role in the monetary system by promoting competition and interoperability between payment platforms." But that does not appear to be the role that the BCB plays with regard Pix. Rather, it appears to be competing directly with private-sector payment-service providers, while also imposing regulatory restrictions that intentionally impede those private-sector competitors.
- It is likely that Pix superficially reduces costs for some participants in the system (namely merchants, who might pass on these savings to consumers) but it almost certainly increases costs for others (banks and their customers). Given the lack of transparency regarding costs, it is difficult to know what the net effect is.
- Brazil's recent experience with Pix shows that if a country's largest banks are forced to participate in a system and the private sector is prevented from competing, it is possible to achieve significant rates of adoption. But this should not be regarded as a positive accomplishment.
- Brazil's recent experience with Pix also shows that, with a narrow focus on adoption, it is possible to undermine at least two of the key potential advantages of electronic value transfer, namely security and traceability.
- With Pix, the BCB violates a core principle of banking supervision, namely the separation of oversight of payment networks from operation of a payment network. It also appears to violate one of the FATF's key recommendations by enabling the use of anonymous accounts. It must be regarded as unusual that BIS researchers would overlook these obvious defects.

Indeed, a better set of key takeaways from Brazil's experience with Pix to date would be:

- Innovative payments technologies have the capacity to provide benefits to all members of society. Among other things, they can improve efficiency, reduce costs, and increase financial inclusion. However, there are dangers associated with government agencies, including central banks,

⁴⁸ Duarte et al., *supra* note 2, at 3.

attempting to provide such services, especially when they limit competition from the private sector.

- Central banks should avoid being both the regulator of and a provider of payment services. Where such dual roles are undertaken, there should be clear separation between the units responsible for each.
- Where a central bank provides a payment service, it should seek to recover the full cost of that service, including operational costs, capital costs, and any other associated costs, such as marketing. Ideally, it would also include in that cost calculation a component for forgone taxes that would otherwise have been collected had the service been provided by the private sector.

Failure to heed these lessons is likely to result in lower rates of innovation, impede deployment of new payment technologies and other fintech products, and could ultimately harm the prospects for financial inclusion.