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LEADING THE WAY IN PAYMENTS: HOW CENTRAL BANKS ARE USING INNOVATION TO PROMOTE FINANCIAL INCLUSION AND RESHAPE COMPETITION

Juliana B. Bolzani

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Juliana B. Bolzani[*]

ABSTRACT

Central banks have increasingly embraced their role in advancing financial inclusion alongside their more traditional goals of maintaining monetary and financial stability. To that end, some central banks are using not just rules and regulations but innovation through direct intervention. Pix, the instant payments scheme powered by the Central Bank of Brazil, is a case in point. It illustrates the impact a proactive central bank can have on achieving inclusion and competition in payments while flashing out elements related to the discussion about public and private participation in the payments industry. Pix indicates that central-bank protagonism in payments can be a potent tool to promote inclusion and enhance competition, notably when private actors seem unwilling or incapable of doing so by themselves. However, the legitimacy of central-bank innovative interventions in payments may be questioned if central banks do not have a clear legal authority underpinning and setting the boundaries of their activism. This Article thus examines how far central banks can go with their innovative actions without overplaying their hand or displacing private initiative and ingenuity.

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[*] Lawyer at the Central Bank of Brazil and doctoral candidate at Duke University School of Law. The views and opinions expressed here are mine and do not reflect the position or policy of any of the institutions with which I am affiliated. I would like to acknowledge helpful comments and suggestions by Lucas A. Freire and Marcelo M. Prates, two of the legal minds behind Pix. All errors remain my own.

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INTRODUCTION

Pursuing price stability—along with full employment, in some jurisdictions—still lies at the core of central banks' mission.[1] However, central banks have reinterpreted their mandates and taken over new responsibilities since the 2008 global financial crisis, often in the absence of legislative changes. For example, the crisis' aftermath firmly positioned central banks as guardians of financial stability, highlighting the importance of their macroprudential regulation and supervision functions.[2] More recently, central banks have started to consider whether and how climate change, income inequality, and racial and gender disparities should influence their policy choices and the tools used to implement them.[3] Finally, they have increasingly embraced their role in advancing financial inclusion, under express legal authority or because they consider financial inclusion an underlying aim woven into their traditional mandates.[4] For example, financial inclusion is one of the main objectives central banks seek to achieve when taking action to improve payment systems, notably in emerging

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[1] The United States, Australia, and, more recently, New Zealand, are examples of jurisdictions that have assigned central banks a dual mandate of ensuring price stability and promoting maximum employment, without hierarchy between these two goals.

[2] *See* Randal K. Quarles, Vice Chair for Supervision, Fed. Rsrv., Law and Macroeconomics: The Global Evolution of Macroprudential Regulation at the Georgetown University Law Center "Law and Macroeconomics" conference (Sept. 27, 2019); Gianni Toniolo & Eugene N. White, *The Evolution of the Financial Stability Mandate: From its Origins to the Present Day* (Nat'l Bureau of Econ. Rsch., Working Paper, No. 20844, Jan. 2015). Since 2014, for example, the European Central Bank (ECB) has been in charge of the supervision of all credit institutions that participate in the Single Supervisory Mechanism (SSM), constituted by the ECB and the national competent authorities in the Eurozone member states. *See* Council Regulation, No. 1024/2013 of Oct. 15, 2013 O.J. (L 287/63) (EU) (conferring specific tasks on the European Central Bank concerning policies relating to the prudential supervision of credit institutions).

The Bank of England, in turn, now has an explicit financial stability mandate. *See* Financial Services Act 2012, C. 21 (UK), https://www.legislation.gov.uk/ukpga/2012/21/section/4/enacted. About potential conflicts between the financial-stability and price-stability sides of a central-bank mandate, see Otmar Issing, *Monetary and Financial Stability: Is There a Trade-Off?*, BIS Papers No. 18, 16 (Sept. 2003), https://www.bis.org/publ/bppdf/bispap18.pdf. *But see* Markus Brunnermeier et al., *The Fundamental Principles of Financial Regulation*, GENEVA REPS. ON WORLD ECON. 11, at 57 (2009) (stating that the fulfillment of these two sides of the mandate can be complementary).

[3] *See, e.g.*, Louis-Phillipe Rochon & Guillaume Vallet, *The Institutions of the People, by the People and for the People? Addressing Central Banks' Power and Social Responsibility in a Democracy*, 75 PSL Q. REV. 83, 90 (2022) (emphasizing the income distributive nature of monetary policy).

[4] *See* Adrienne A. Harris & Michael S. Barr, *Central Bank of the Future* (U. Mich. Ctr. on Fin., L. & Pol'y, Working Paper No. 1, 2019).

economies and in the retail segment, by incentivizing private innovation and, at times, taking innovation into their own hands.[5]

Central banks can act as payment-system and payment-scheme operators and provide payment services to the public, directly or through supervised institutions, and even exercise certain activities that would be traditionally assigned to the private sector. This type of government intervention is a manifestation of central banks meeting "specific developmental goals through direct participation in private financial markets."[6] Such central-bank active intervention in markets can drive controversy, given that central bankers build their reputation and justify their independence within the government by behaving as neutral, apolitical and technocratic experts.[7] For one, private Payment Service Providers (PSPs) can argue that central banks' participation as market actors means unfair competition in the payment space.[8] However, central banks' protagonism in

[5] "*Retail payments* typically relate to the purchase of goods and services by consumers and businesses. Each of these payments tends to be for relatively low value, but volumes are large. Within retail payment, there are person-to-person payments (e.g. transfer of money to a friend or family member), person-to-business payments (e.g. bill payments), business-to-person payments (e.g. salary payments) and business-to-business payments. These payment systems are run by both private and public sector providers. In contrast, *wholesale payments* are between financial institutions—for example, payments to settle securities and foreign exchange trades, payments to and from central counterparties, and other interbank funding transactions." Morten L. Bech & Jenny Hancock, *Innovations in Payments*, BIS Q. REV. 21, 22 (Mar. 1, 2020), https://www.bis.org/publ/qtrpdf/r_qt2003f.pdf.

[6] Robert C. Hockett & Saule T. Omarova, *Public Actors in Private Markets: Toward a Developmental Finance State*, 93 WASH. U. L. REV. 103, 116 (2015).

[7] For more information about the struggle to reconcile central bank-independence with central banks' new responsibilities, see CHRISTOPHER ADOLPH, BANKER, BUREAUCRATS, AND CENTRAL BANK POLITICS: THE MYTH OF NEUTRALITY (Cambridge Univ. Press 2016). *See also* Adam Tooze, *The Death of the Central Bank Myth*, FOREIGN POL'Y (May 13, 2020).

[8] For the purpose of this Article, a payment service provider (PSP) is any financial or non-financial institution that provides services to facilitate payments between two or more parties, such as transactional-account operation, execution of payment transactions, issuance of payment instruments, acquiring of payment transactions, money remittance, payment initiation services, and account-information services. The EU Payment Services Directive 2 (PSD2) brings similar definitions of PSP and payment services. Directive 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No. 1093/2020, and repealing Directive 2007/64/EC, 4(11) O.J. (L337) 35 (EU). *See also* Resolução BCB N° 1, de 12 de Agosto de 2020, Pix Rules, Art. 3(XVIII), Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.) (establishing that a payment services provider is a "financial institution or payment institution that provides payment services to an end user"); Tanai Khiaonarong & Terry Goh, *Fintech and Payments Regulation: Analytical Framework* 8–9 (IMF, Working Paper No. 20/75, May 29, 2020) (laying out a taxonomy of payment services and listing six categories of payment services: (i) account issuance; (ii) electronic money issuance;

payments can be viewed under a more positive light—central banks can fill in the gaps left by private markets when necessary to promote financial inclusion.

This Article presents a case study of Pix, an instant payments scheme for retail transactions that was created and is presently maintained and regulated by the Central Bank of Brazil (*Banco Central do Brasil*, or BCB). It suggests that central banks can successfully advance financial inclusion by playing a market-actor role in payment systems. It also contends that this proactive function is compatible with the financial-inclusion and payment-system components of central banks' mandates. However, express legal authority would enhance legitimacy for central-bank innovative interventions in payments. Clear mandates for central banks to innovate in payment systems would help prevent central bankers from relying solely on expansive, and sometimes questionable, legislative interpretation. Explicit instructions from Congress, establishing boundaries for central banks' role as market actors in payments, would thus contribute to central banks' democratically retaining their independence while actively pursuing their statutory goals and public values.

The article proceeds as follows. Part I analyzes central banks' authority to regulate and operate payment systems and their mandate to promote financial inclusion in the digital era. Part II describes the structure and functioning of Pix in Brazil, highlighting the features that make this instant payments scheme an example of successful central-bank intervention in payments and describing the role the BCB has played as an innovator in the Brazilian instant payments ecosystem. Part III focuses on the impacts of central-bank innovation on financial inclusion and competition. It further explores Pix and other innovative payment structures' achievements, promises, and limitations on advancing financial inclusion, teasing out the effects some central bank initiatives can have on improving the lives of the unbanked and underbanked population. It also examines the effects of innovative central-bank actions on competition in payments. The article ends with a critique of the legal framework that underpins central banks' activism in payment systems, asserting that central banks' legitimacy would benefit

(iii) domestic fund transfer; (iv) cross-border funds transfer; (v) merchant acquisition; and (vi) digital payment tokens).

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from legislators clearly describing the products and services central banks are allowed—and required—to develop and offer in payments.

I. PAYMENT SYSTEMS AND FINANCIAL INCLUSION: THE ROLE OF CENTRAL BANKS

A. Central Banks' Authority to Regulate and Operate Payment Systems

Before discussing central banks' authority over payment systems, let's take a step back to define key terms, starting with "payment system," since concepts in the payments field are not always consistent. A payment system can be defined as "a funds transfer system with formal and standardized arrangements and common rules for the processing, clearing and/or settlement of payment transactions."[9] Payment systems are essential elements of the financial system because they provide the infrastructure that manages the flow of funds in the economy and establishes who owns which amount of money at any time.[10]

But the term "Payment System"—or "Payments System"—is also used in a broader and slightly different sense. It refers to the set of all regulated instruments, procedures, systems, and infrastructures, including financial market infrastructures (FMI), that facilitate fund and asset transfers and operations with foreign exchange, derivatives contracts, or securities in a country or currency area[11]—for example, the "Brazilian Payment System,"[12]

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[9] Directive 2015/2366, *supra* note 8, art. 4(7).

[10] Tomás J.T. Baliño et al., *Payment System Reforms and Monetary Policy*, FIN. & DEV., Mar. 1996 at 2.

[11] *See* EUR. CENT. BANK (ECB), *Glossary of Terms Related to Payment, Clearing and Settlement Systems* (Dec. 2009) (acknowledging the two meanings of the term "payment system"). *See also* BIS Committee on Payment and Settlement Systems, *General Guidance for National Payment System Development* (2006) (referring to the development of a "national payment system"). According to the Bank for International Settlements (BIS), a Financial Market Infrastructure (FMI) is "a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling or recording payments, securities, derivatives or other financial transactions." BIS Committee on Payment and Settlement Systems, *A Glossary of Terms Used in Payments and Settlement Systems*, at 8 (Apr. 16, 2012).

[12] *See* Lei N° 10,214, de 27 de Março de 2001, Diário Oficial da União [D.O.U.] de 28.03.2001 [Law 10,214 of Mar. 27, 2001] (Braz.).

"U.S. Payment System,"[13] "Eurozone Payment System,"[14] and "United Kingdom Payment System."[15] Under this nomenclature, a given jurisdiction's national "Payment System" encompasses all the networks, public and private, that process assets and fund transfers in that jurisdiction. Whenever this Article alludes to "payment system" or "payment systems," with lower case, it means the narrower definition of a payment system. When referring to the broader definition, as in a national or a currency area "Payment System," the article will employ capital letters.

Central banks' authority to regulate and operate payment systems is connected to their objective of protecting financial stability, as well as to their core mandate to formulate and implement monetary policy.[16] Banks hold accounts with the central bank, the "reserve" or "master accounts," and the deposits held in these accounts, known as "reserves," are crucial for the use of monetary policy tools. In some jurisdictions, non-depository financial institutions and non-financial institutions subject to the central bank's supervision are also allowed to keep accounts at the central bank.[17] Other possible holders of reserve accounts include general non-commercial entities, such as the government, securities firms, clearing houses, foreign central banks, international financial institutions, and international organizations.

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[13] BD. OF GOVERNORS OF THE FED. RSRV. SYS., THE FED EXPLAINED: WHAT THE CENTRAL BANK DOES (Aug. 2021), at 86 ("The Federal Reserve performs several key functions with the respect to the U.S. payment system. These functions help keep cash, check, and electronic transactions moving reliably through the U.S. economy on behalf of consumers, businesses, and others participating in the economy.").

[14] Claude Trichet, *The Payment System: Payments, Securities and Derivatives, and the Role of the Eurosystem*, EUR. CENT. BANK 16 (Tom Kokkola ed., 2010).

[15] Claire Greene et al., *Costs and Benefits of Building Faster Payment Systems: The U.K. Experience and Implications for the United States* 4 (Fed. Rsrv. Bank Bos., Working Paper No. 14-5, 2015) (referring to "the U.K. payment system before the FPS [Faster Payments Service]," to compare it with the United States Payment System).

[16] The smooth functioning of payment systems "is an important precondition for the central banks' ability to contribute to financial stability, to implement monetary policy and to maintain public confidence in the currency." EUR. CENT. BANK, *Revised Oversight Framework for Retail Payment Systems* (Feb. 2016) [hereinafter EUR. CENT. BANK—EURO SYSTEM].

[17] *See* Lei N° 4,595, de 31 de Dezembro de 1964, Art. 10(IV), Diário Oficial da União, [D.O.U.] de 31.12.1964 [Law 4,595 of Dec. 31, 1964, Art. 10(IV)] (Braz.) (for depository institutions); *see* Lei N° 12,865, Art. 14, de 9 de Outubro de 2013, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013, Art. 14] (Braz.) (for non-depository institutions that are part of the Brazilian Payment System).

In advanced economies, the increase in the size of central banks' balance sheets, which resulted from massive asset purchases and emergency lending programs following the 2008 global financial crisis and the COVID crisis, have diminished the importance of reserve requirements and daily open-market operations for calibrating short-term interest rates.[18] Nevertheless, reserves remain relevant for monetary-policy implementation, notably via reserves remuneration and large-scale asset purchases, and for liquidity assistance, including lender-of-last-resort support.[19] It is through reserves that central banks ultimately manage how much money is circulating in the economy and how easy or difficult (or how costly) it is for regular people to borrow money or to pay back loans.

Furthermore, the origin of central banks itself can be pinned on their role in clearing and settling payments. Central banks' precursors, commercial banks from seventeenth-century northern Europe, such as the Bank of Amsterdam, had initially the main purpose of providing a payment and clearing system to the economy.[20] Because the final settlement of all payments using a sovereign currency is done with central-bank money (in the form of reserves),[21] central banks cannot be completely ousted from payment

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[18] *See generally* BD. OF GOVERNORS OF THE FED. RSRV. SYS., RESERVE REQUIREMENTS (Jan. 4, 2022) (responding to the COVID-19 crisis in March 2020, the Board of Governors of the Federal Reserve System (the "Board") reduced the reserve requirements to zero).

[19] *See* Andrew Foerster & Sylvain Leduc, *Why is the Fed's Balance Sheet Still So Big?*, 16 FED. RSRV. BANK OF S.F. ECON. LETTER, June 3, 2019 (explaining that, since the aftermath of the 2008 financial crisis, the Fed has paid interest on the bank reserves as a tool to influence other interest rates in the economy).

[20] Isabel Schnabel & Hyon Song Shin, *Money and Trust: Lessons from the 1620s for Money in the Digital Age* (Bank for Int'l Settlements Working Papers No. 698 Feb. 2018) (explaining "the role of public deposit banks established in the early 1600s" and arguing that these banks were early "precursors of modern central banks"); *see also* NIALL FERGUSON, THE ASCENT OF MONEY: A FINANCIAL HISTORY OF THE WORLD (Penguin Press 2008) (explaining that this theory contrasts with the conventional view maintaining that central banks were initially established to finance states' wars, therefore focusing on central banks' ability to lend).

[21] *See* GARRETH RULE, UNDERSTANDING THE CENTRAL BANK BALANCE SHEET 10 (Bank of England 2015), https://www.bankofengland.co.uk/-/media/boe/files/ccbs/resources/understanding-the-central-bank-balance-sheet.pdf ("[B]anking transactions between customers of different banks are . . . [ultimately] settled through transfers between [the] reserves accounts [these banks have] at the central bank"); *see also* Dong He, *Monetary Policy in the Digital Age*, INT'L MONETARY FUND, FIN. & DEV. (June 2018), https://www.imf.org/external/pubs/ft/fandd/2018/06/central-bank-monetary-policy-and-cryptocurrencies/he.htm (explaining that cryptocurrencies' main ambition is to revolutionize this framework by serving as a medium of exchange that would function independently from central bank money).

systems' structure and functioning.[22] Further, central banks' power to create money by crediting reserve accounts can be used to ensure the payment systems are sound and efficient through the provision of intra-day loans and credit standing facilities that mitigate credit and liquidity risks.[23] Finally, efficient and secure retail payments ecosystems lead to trust in the sovereign currency as a medium of exchange.[24]

Given the connection between reserves' availability, payments flow, and the pursuit of monetary and financial stability, legislators often assign to the central bank the responsibility for regulating and operating payment systems.[25] For example, both the Treaty on the Functioning of the European Union (TFEU) and the Statute of the European System of Central Banks (ESCB) and of the European Central Bank (ECB)[26] state that "basic tasks to be carried out through the ESCB shall be . . . to promote the smooth operation of payment systems."[27] Under this legal authority, the ECB has established oversight requirements for Systemically Important Payment Systems (SIPS), implementing the CPSS-IOSCO principles for financial market

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[22] Marcelo M. Prates, *Money in the Twenty-First Century: From Rusty Coins to Digital Currencies*, 15 OHIO STATE BUS. L.J. 164 (2021). Notice that not all payments are finally settled with central-bank money, because (i) when the transfer of funds occurs between two accounts held at the same bank, there is merely a book transfer, without a change in the banks' accounts held at the central bank; (ii) payments can be, at least in theory, finally settled in private-issued currencies, such as cryptocurrencies.

[23] *See* COMM. ON PAYMENT AND SETTLEMENT SYS. (CPSS), BANK FOR INT'L SETTLEMENTS, THE ROLE OF CENTRAL BANK MONEY IN PAYMENT SYSTEMS 4 (Aug. 2003).

[24] *See generally* Cristiano Cozer, *Perfis de Atuação do Banco Central do Brasil no Segmento de Pagamentos de Varejo*, DIREITO DOS MEIOS DE PAGAMENTO: NATUREZA JURÍDICA E REFLEXÕES sobre a Lei N° 12.865/2013, Ed. Gabriel Cohen, São Paulo: Editora Quartier Latin do Brasil, 2020, at 35–59.

[25] In this Article, unless otherwise specified, the terms "regulation" and "regulator" are used in a broad sense that encompasses both (i) the administrative rules an agency or entity issues, or an agency or entity that has rulemaking authority, respectively, and (ii) supervisory actions taken by the agency or entity (oversight, examination and enforcement actions), or the supervisor, respectively. As Harvard Professor and former Fed governor Daniel Tarullo states, "[t]erminology can be confusing here, since bank 'regulation' is often used to refer both to the whole enterprise of prudential regulation—including legislation, notice-and-comment rule, and supervision—and more narrowly to the set of regulations promulgated by banking agencies and collected in the Code of Federal Regulations." Daniel K. Tarullo, *Bank Supervision and Administrative Law*, COLUM. BUS. L. REV. 4 n.5 (forthcoming).

[26] Treaty on the Functioning of the Eur. Union, "On the Statute of the European System of the Central Banks and the European Central Bank" protocol 4, 2016 O.J. (C 202) 230 (stating that the ESCB, also known as "the Eurosystem," comprises the ECB and the national central banks (NCBs) of the countries that have the euro as their currency).

[27] Treaty on the Functioning of the Eur. Union, Art. 127(2), 2016 O.J. (C 202) 102; Treaty on the Functioning of the Eur. Union, "On the Statute of the European System of the Central Banks and the European Central Bank" protocol 4, art. 3.1, 2016 O.J. (C 202) 230.

infrastructures, adopted in 2012 by the Committee on Payment and Settlement Systems (CPSS) of the Bank for International Settlements (BIS) and the International Organization of Securities' Commission (IOSCO).[28] In 2018, the ESCB launched the TARGET Instant Payment Settlement (TIPS), a system that enables PSPs to offer instant payment services to their clients, individuals, or corporations, 24 hours a day, 7 days a week, 365 days a year (24/7/365) across the euro area based on the SEPA Instant Credit Transfer (SCT Inst) payment scheme.[29] As other central banks, the ECB and the Eurosystem national central banks have acted in payment clearing and settlement systems as regulators, liquidity providers, infrastructure providers, operators, and participants of payment systems.[30]

In the United States, payment system functions have been at the core of the central bank's mission since the early days of the Federal Reserve System (the "Fed").[31] The Fed was created to offer clearing services for banks across the country and function as a safety net, avoiding liquidity crises such as those that took place in the early 1900s.[32] Since its creation, several statutes assign to the Fed the roles of regulator, supervisor, and operator in payment systems:[33] The Federal Reserve Act of 1913 (FRA),[34] the Bank Service

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[28] Regulation of the Eur. Central Bank, *On Oversight Requirements for Systemically Important Payment Systems*, 2014 O.J. (L 217) 16.

[29] EUR. CENT. BANK, *What is TARGET Instant Payment Settlement (TIPS)*. *See also* Ignazio Visco, Governor, Bank of It., The Role of TIPS for the Future Payments Landscape (Nov. 27, 2020) (framing TIPS as an "innovative" and "customer-friendly" solution developed by the ESCB, operating on a full cost-recovery and not-for-profit basis).

[30] BANK FOR INT'L SETTLEMENTS, PAYMENT, CLEARING AND SETTLEMENT SYSTEMS IN THE EURO AREA 75 (2012).

[31] *See* Juliana B. Bolzani, *Independent Central Banks and Independent Agencies: Is the Fed Super Independent?*, 22 U.C. DAVIS BUS. L.J. 195 (2022) ("The Federal Reserve System . . . is composed of the Federal Open Market Committee (FOMC), . . . the Board[,] and twelve Federal Reserve banks. . . . When this article mentions the 'Federal Reserve System' or the 'Fed,' it means all these entities as a group, but technically there are at least two agencies inside the Fed: the FOMC and the Board.").

[32] Randall S. Kroszner, *Lessons from Financial Crises: The Role of Clearinghouses*, 18 J. FIN. SERV. RSCH. 157 (2000). The most severe of these episodes was the Panic of 1907, when private banks and clearinghouses raised the funds and coordinated efforts to provide liquidity to the system, in the absence of a government institution able to respond to bank runs and financial crises; *see generally* Paul M. Connolly & Robert W. Eisenmenger, *The Role of the Federal Reserve in the Payments System*, 45 FED. RSRV. BANK OF BOS. CONFERENCE SERIES 131, 131–61 (2000).

[33] BD. OF GOVERNORS OF THE FED. RES. SYS., POLICIES: THE FEDERAL RESERVE IN THE PAYMENTS SYSTEM (Aug. 11, 2020).

[34] 12 U.S.C. §§ 221–522 (2018).

Company Act of 1962,[35] the Fair Credit Billing Act of 1974,[36] the Electronic Fund Transfers Act of 1978,[37] the Monetary Control Act of 1980,[38] the Expedited Funds Availability Act of 1987,[39] the Check Clearing for the 21st Century Act of 2003,[40] and the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (the "Dodd-Frank Act").[41]

Presently, the Fed, through the Board of Governors of the Federal Reserve System (the "Board") and the Federal Reserve Banks (the "Reserve Banks"), is responsible for regulating certain aspects of payment systems and other financial market infrastructures; for providing intraday and overnight liquidity to payment systems' participants; and for providing payment and settlement services to the federal government and the banking industry, such as maintaining accounts for depository institutions (the master accounts), transferring funds electronically, collecting checks, distributing and receiving currency and coin, and settling payments and eligible securities transactions.[42]

Section 16(14) of the FRA grants the Board authority to "make and promulgate from time-to-time regulations governing the transfer of funds and charges therefore among Reserve Banks and their branches."[43] The authority conferred by this statutory provision, however, encompasses only the transfer of funds among the Reserve banks and their branches. The Fed has limited regulatory authority over interbank transfers of funds and the private provision of retail payment services in the United States.[44] Therefore, it has

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[35] 12 U.S.C. §§ 1861–1867.

[36] 15 U.S.C. §§ 1666–1666j.

[37] 15 U.S.C. §§ 1693–1693r.

[38] Depository Institutions Deregulation and Monetary Control Act of 1980, Pub. L. No. 96-221, 94 Stat. 132 (codified as amended in scattered sections of 12 U.S.C.).

[39] 12 U.S.C. §§ 4001–4010.

[40] 12 U.S.C. §§ 5001–5018.

[41] 12 U.S.C. §§ 5301–5641; *see also* Dodd-Frank Act 12 U.S.C. §§ 5461–5472 (expanding the Fed's regulatory powers over systemically important financial market utilities and payment, clearing, and settlement activities).

[42] *See generally* BD. OF GOVERNORS OF THE FED. RSRV. SYS., THE FED EXPLAINED: WHAT THE CENTRAL BANK DOES 84–111 (2021).

[43] 12 U.S.C. § 248-1.

[44] Federal Reserve Actions to Support Interbank Settlement of Faster Payments, 84 Fed. Reg. 39297 (Aug. 9, 2019). *See also* Adam J. Levitin, *Public-Private Competition in Payments: The Role of the Federal Reserve* 6 (Geo. Univ. L. Ctr. Bus., Econ. and Regul. Pol'y Working Paper, Rsch. Paper No. 1420061, 2009) (claiming that the Fed regulates only the consumer protection side of payment cards, not the area of merchant fees or clearing practices without direct implication to consumers); Stuart E. Weiner,

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relied on its authority to act as an operator in payments markets to make the Payment System more efficient, secure, and accessible.[45]

In other jurisdictions, the central bank shares the responsibilities for regulating payment systems with government entities.[46] The Bank of England is in charge of overseeing "certain systems for transferring money and certain persons who provide services in relation to such systems."[47] Moreover, the Bank of England acts as a settlement agent for payments made from one financial institution to the other, through a Real-Time Gross Settlement (RTGS) system, and operates CHAPS, a payment system that settles, on the same day and in central-bank funds, high-value wholesale payments and time-critical, lower-value payments.[48] CHAPS can settle urgent transactions in real time, but it is only open from 6:00 AM to 6:00 PM, with the possibility of extension until 8:00 PM[49] Other regulatory duties related to payment systems are performed by the Prudential Regulation Authority (PRA), the Financial Conduct Authority (FCA), and FCA's subsidiary, the Payment Systems Regulator (PSR). The FCA, for instance, issues authorizations for PSPs, such as money remitters, non-bank credit card

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The Federal Reserve's Role in Retail Payments: Adapting to a New Environment, 93 (IV) FED. RSRV. BANK OF KAN. CITY ECON. REV. 35, 54–55 (2008) (detailing the Fed's role as an overseer in retail payments and citing the Fed's responsibilities for managing risk in systemically important payments); *but see* Robert D. Cooter & Edward L. Rubin, *Orders and Incentives as Regulatory Methods: The Expedited Funds Availability Act of 1987*, 35 UCLA L. REV. 1115, 1149 (1987) (defending that the Expedited Funds Availability Act of 1987 has given the Fed the power to regulate the entire payment system); Peter Conti-Brown & David A. Wishnick, *Private Markets, Public Options, and the Payment System*, 37 YALE J. REG. 380, 427–28 (2020) (arguing that the Fed has the authority to supervise payment-platform operators, based on the Bank Services Company Act of 1962).

[45] Lael Brainard, Governor, Fed. Rsrv., Delivering Fast Payments for All (Aug. 5, 2019) ("The Federal Reserve does not have regulatory authority over the pricing set by a private-sector system or to require a private-sector system to extend the service to banks of all sizes, particularly the last mile. In some other countries, central banks have been assigned the responsibility for regulating payment systems. However, this is not the approach that Congress has taken. Instead, the Federal Reserve's role as an operator has long been seen as an effective approach to promote accessible, safe, and efficient payments in the United States.").

[46] *See, e.g.*, Financial Services (Banking Reform) Act 2013, c. 33, Memorandum of Understanding between the Bank of England, the Financial Conduct Authority, the Payment Systems Regulator and the Prudential Regulation Authority (2018) (UK).

[47] Banking Act of 2009, c. 1 § 181 (UK).

[48] BANK OF ENGLAND, A BRIEF INTRODUCTION TO RTGS AND CHAPS 1–4 (2021) (noting that the RTGS infrastructures is an accounting system that underpins settlement of sterling payments, rather than being a payment system itself).

[49] BACS ET AL., AN INTRODUCTION TO THE UK'S INTERBANK PAYMENT SCHEMES 8 (2017).

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issuers, and e-money institutions, and supervises PSPs regarding prudential and conduct requirements.[50] The PSR, in turn, was created by the Financial Services Act 2013 to pursue competition, innovation, and service-user objectives in payment systems.[51] PSR regulates the payment systems designated by the Treasury as "regulated payment systems,"[52] and has concurrent competition powers alongside UK's Competition & Markets Authority (CMA) over their participation in payment systems.[53]

In Brazil, the central bank has ample authority to regulate the Payment System, albeit subject to guidelines established by the National Monetary Council (*Conselho Monetário Nacional*, or CMN).[54] The BCB is in charge of regulating and licensing payment systems, as well as regulating and licensing payment schemes and payment institutions.[55] Additionally, the BCB operates three major payment systems: the Reserves Transfer System (STR), an RTGS system for clearing and settlement of transactions among institutions that hold reserves or settlement accounts with the BCB; the Special System for Settlement and Custody (Selic), for clearing and settlement of transactions with government securities; and the Instant Payments System (*Sistema de Pagamentos Instantâneos*, or SPI).[56]

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[50] *See* FIN. CONDUCT AUTH., *Authorisation and Registration: e-money institutions (EMI) and payment institutions (PI)* (Mar. 3, 2021); *see also* Payment Services Regulations 2017 (U.K.); Electronic Money Regulations 2011 (U.K.).

[51] Financial Services (Banking Reform) Act 2013 § 49 (U.K.); *see also* PAYMENT SYSTEMS REGULATOR, *Who We Regulate* (2022), https://www.psr.org.uk/payment-systems/who-we-regulate/.

[52] Financial Services (Banking Reform) Act 2013 §§ 43–48 (U.K.). Eight payment systems have been designated by the Treasury to be regulated by the PSR: Bacs, CHAPS, Cheque & Credit, FPS, LINK, NICC, Mastercard, and Visa Europe (Visa).

[53] Financial Services (Banking Reform) Act 2013 §§ 50, 59–67 (U.K.). *See generally* Enterprise Act 2002 (U.K.); Competition Act 1998 (U.K.).

[54] The CMN is a policy committee composed of the Ministry of Economy, the Ministry of Planning and Budget, and the President of the Central Bank of Brazil. *See* Lei N° 9,069, de 29 de Junho de 1995, Art. 8, Diário Oficial da União [D.O.U.] de 30.6.1995 [Law 9,069 of June 29, 1995, Art. 8] (Braz.).

[55] *See* Lei N° 12,865, de 9 de Outubro de 2013, Art. 9, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013, Art. 9] (Braz.); Lei N° 10,214, de 27 de Março de 2001, Art. 10, Diário Oficial da União [D.O.U.] de 28.03.2001 [Law 10,214 of Mar. 27, 2001, Art. 10] (Braz.).

[56] Resolução BCB N° 105, de 9 de Junho de 2021, Diário Oficial da União [D.O.U.] de 11.06.2021 [BCB Resolution 105 of June 9, 2021] (Braz.) (regulating STR, reserve bank accounts and liquidation accounts at the BCB); Resolução BCB N° 55, de 16 de Dezembro de 2020, Diário Oficial da União [D.O.U.] de 17.12.2020 [BCB Resolution 55 of Dec. 16, 2020] (Braz.) (regulating Selic); Resolução BCB N° 195, de 3 de Março de 2022, Diário Oficial da União [D.O.U.] de 07.03.2022 [BCB Resolution 195 of Mar. 3, 2022] (Braz.) (regulating SPI and PI Accounts). *See also* BANCO CENTRAL DO BRASIL, *Brazilian*

B. Central Banks' Mandate to Promote Financial Inclusion

Central banks have increasingly embraced financial inclusion as part of their mission, as revealed in central banks' policies and actions across jurisdictions.[57] Although financial inclusion may not be a goal explicitly set in their legal mandates,[58] central banks have found in their more traditional authority solid grounds to justify their involvement in inclusion matters. Research has shown that the degree of financial inclusion may affect the performance of traditional central banks' functions, such as monetary policy and bank supervision.[59] When resulting from "bankarization," financial inclusion may increase the effectiveness of interest rate tools.[60] More financial inclusion may also lead central banks to focus on measures of inflation that discount volatile prices, such as food and energy, considering that excluded consumers tend to be employed in the volatile-price sector and consume goods produced by this sector.[61] Likewise, financial inclusion contributes to financial stability, although credit expansion requires proper supervision lest it becomes a threat to financial stability.[62]

In 2008, a group of developing countries' central banks established the Alliance for Financial Inclusion (AFI), which later launched the Maya

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Payments System, https://www.bcb.gov.br/en/financialstability/paymentsystem (last accessed Jan. 6, 2023).

[57] BRUNO TISSOT & BLAISE GADANECZ, MEASURES OF FINANCIAL INCLUSION—A CENTRAL BANK PERSPECTIVE 4–6 (Irving Fisher Comm. on Central Bank Stat., Bank for Int'l Settlements 2017), https://www.bis.org/ifc/publ/ifcb47q_rh.pdf.

[58] RAPHAEL AUER ET AL., CENTRAL BANK DIGITAL CURRENCIES: A NEW TOOL IN THE FINANCIAL INCLUSION TOOLKIT? 4 (World Bank Group, Bank for Int'l Settlements 2022), https://www.bis.org/fsi/publ/insights41.pdf (pointing out that, from the nine central banks selected for the study, some have financial inclusion as an explicit component of their mandate; for others, financial inclusion is an implicit goal, included in the central bank's mandate to protect payment systems' soundness and efficiency and to promote economic growth).

[59] JAMES YETMAN, ADAPTING MONETARY POLICY TO INCREASING FINANCIAL INCLUSION (Irving Fisher Comm. on Central Bank Stats. 2017), https://www.bis.org/ifc/publ/ifcb47m_rh.pdf; Ratna Sahay et al., *Financial Inclusion: Can It Meet Multiple Macroeconomic Goals?* (Sept. 2015), IMF Staff Discussion Note SDN/15/17, https://www.imf.org/external/pubs/ft/sdn/2015/sdn1517.pdf.

[60] *See* YETMAN, *supra* note 59, at 4–6.

[61] *Id.* at 3–4.

[62] *See* ORG. FOR ECON. COOP. AND DEV., G20/OECD HIGH-LEVEL PRINCIPLES ON FINANCIAL CONSUMER PROTECTION (2022), https://www.oecd.org/daf/fin/financial-education/G20_OECD%20FCP%20Principles.pdf (updating the existing principles on financial consumer protection endorsed by the G20 Leaders and adopted by the OECD Council to incorporate an "Access and Inclusion" principle); *see also* Sahay et al., *supra* note 59, at 16–20.

Declaration, a global initiative whereby AFI members committed to put in place policies that enable cost-effective access to financial services making use of technological innovation.[63] Today, central banks and other financial regulators from seventy-five developing countries are members of the AFI, whose goal is to "empower[] policymakers to increase access and usage of quality financial services for the underserved, through the formulation, implementation and global advocacy of sustainable and inclusive policies."[64]

In the digital era, central banks feel they must guarantee that the rapid technological innovations that are emerging in private markets meet public needs, such as financial and monetary stability, consumer protection, and payments' soundness and efficiency.[65] Given the connection between financial inclusion, on one side, and monetary and financial stability and payment systems' soundness and efficiency, on the other, central banks and other financial regulators have a legal mandate to create an environment that can produce inclusive results.[66] Central banks' optimal regulation of fintech in payment services, accordingly, depends on directing financial innovation to advance financial inclusion.[67]

In general, central banks are legally prevented from transacting directly with individuals or non-financial institutions.[68] This prohibition is grounded

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[63] ALL. FOR FIN. INCLUSION, *Maya Declaration* (2015), https://www.afi-global.org/wp-content/uploads/publications/2017-04/Maya%20Declaration%20ENG.pdf.

[64] ALL. FOR FIN. INCLUSION, *Global Policy Leadership Alliance* (2022), https://www.afi-global.org/about/.

[65] *See generally* COMM. ON PAYMENTS AND MKT. INFRASTRUCTURE (CPMI) & WORLD BANK GROUP, *Payment aspects of financial inclusion* (Apr. 2016), https://www.bis.org/cpmi/publ/d144.pdf.

[66] *See* Saule T. Omarova, *New Tech v. New Deal: Fintech as a Systemic Phenomenon*, 36 YALE J. REG. 736, 739 (2019) (proposing a systemic view of fintech and framing fintech as both a financial market phenomenon and a regulatory challenge).

[67] *See* BANCO CENTRAL DO BRASIL, RELATÓRIO DE ECONOMIA BANCÁRIA 2020 [BANKING ECON. REP. 2020] 184 n.3 (2021) (showing that the BCB considers that fintechs are institutions with business models based on innovative technology and offering electronic services and products in finance, such as payments and credit. Accordingly, the fintech institutions regulated by the BCB are (i) payment institutions, which are classified as non-financial institutions under Law 12,865 of 2013; and (ii) credit fintechs, which are financial institutions prohibited from receiving deposits, regulated by CMN Resolution 4,656, of 2018).

[68] In Brazil, see Lei N° 4,595, de 31 de Dezembro de 1964, Art. 12, Diário Oficial da União [D.O.U.] de 31.12.1964 [Law 4,595 of Dec. 31, 1964, Art. 12] (Braz.) (prohibiting the BCB from entering into banking transactions with non-financial institutions, except where the law expressly allows it); *see also* Lei N° 12,865, de 9 Octobre de 2013, Art. 14, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013, Art. 14] (Braz.) (permitting the BCB to enter into banking transactions with specific institutions).

on historical reasons, such as an intention to avoid not only competition between the central bank and the private banks for deposits and loans, but also monetary financing, a situation in which the central bank issues money not with price stability in mind but rather to finance projects led by the government in charge.[69] One exception, in the United States, is the emergency lending authority granted by Section 13(3) of the FRA, allowing the Board to make loans during hard times to any participant in any program or facility with broad-based eligibility, though the Fed's use of these emergency lending powers requires the prior approval of the Secretary of the Treasury.[70]

As a result, central banks operate almost exclusively with financial institutions and perform their duties through the filter of the financial system. This organization can be seen as a public-private partnership between the central bank and the financial institutions to operate the monetary and payment systems, or a franchise arrangement, as framed by legal scholars Robert C. Hockett and Saule T. Omarova, from Cornell Law School.[71] Accordingly, Payment Systems function in a two-tiered structure, with the central bank working only with financial institutions, and these institutions keeping relationships with the broader economy and the general public.[72]

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[69] *See* Jens van't Klooster, *Central Banks*, THE CAMBRIDGE HANDBOOK OF CONSTITUTIONAL THEORY (Richard Bellamy & Jeff King eds., forthcoming) (manuscript at 3–4) (describing the prohibition on central banks' providing funds directly to individual citizens and non-financial firms as a normative principle that informs the design of central bank mandates).

[70] 12 U.S.C. § 343 (2018); *see also* Juliana B. Bolzani, *Has the Cares Act expanded the Fed's legal mandate?*, THE FINREG BLOG (Oct. 26, 2020), https://sites.law.duke.edu/thefinregblog/2020/10/26/has-the-cares-act-expanded-the-feds-legal-mandate/ (detailing the conditions limiting the Fed's activities of lender of last resort under § 13(3)).

[71] Robert C. Hockett & Saule T. Omarova, *The Finance Franchise*, 102 CORNELL L. REV. 1143, 1147 (2017); *see also* Lawrence G. Baxter, *Betting Big: Value, Caution and Accountability in an Era of Large Banks and Complex Finance*, 31 REV. BANKING & FIN. L. 765, 818–21 (2012) (about the co-dependency between sovereign and banks, and the characterization of banks as "instrumentalities of the state").

[72] BANK FOR INT'L SETTLEMENTS, ANNUAL ECONOMIC REPORT 67 (June 24, 2020), https://www.bis.org/publ/arpdf/ar2020e3.pdf; *see also* Agustín Carstens, Gen. Manager, Bank for Int'l Settlements, *The future of money and the payment system: what role for central banks?* (Dec. 5, 2019) ("The modern payment system has two tiers, with the central bank serving as the banker to commercial banks. This two-tier system is the epitome of the account-based monetary system. The central bank grants accounts to commercial banks and other payment service providers (PSPs), so that domestic payments are settled on the central bank's balance sheet.").

This public-private partnership brings benefits and costs to banks and other financial institutions.[73] The privilege of holding a reserve account at the central bank, for instance, is accompanied by regulatory costs, but it also awards banks with more efficiency and widens their reach.[74] A commercial bank that holds an account at the central bank can directly rely on a central counterparty, the central bank, to make interbank transactions easier, faster, and safer.[75] Every other person or institution that does not have an account with the central bank needs the help of a reserve account holder to process clients' payment orders.[76] This is why fintechs that provide payment services are often interested in having their own master account at the Fed instead of partnering with a bank that holds a reserve account—and paying the partner bank accordingly for the privilege of processing payment directly with the central bank.[77] Yet, access to a master account at the Fed is still open to dispute when it comes to institutions that accept uninsured deposits.[78] Section

[73] *See* LEV MENAND, THE FED UNBOUND: CENTRAL BANKING IN A TIME OF CRISIS 84, 94–101 (2022).

[74] *See* Randall Guynn et al., *Davis Polk Discusses Who Can Have a Federal Reserve Master Account*, Colum. L. Sch.: The CLS Blue Sky Blog (May 12, 2021) (noting that a master account is necessary for an institution to have direct access to the Fed's payment systems and to settle transactions in central bank money).

[75] *See* Proposed Guidelines for Evaluating Account and Services Requests, 86 Fed. Reg. 25865 (May 11, 2021) (proposing guidelines to evaluate requests for accounts and services at Federal Reserve Banks); *see also* Guidelines for Evaluating Account and Services Requests, 87 Fed. Reg. 12957 (Mar. 8, 2022) (proposing supplemental guidelines for notice and comment); Press Release, Bd. of Governors of the Fed. Rsrv. Sys., Federal Reserve Board invites public comment on supplement to its May 2021 proposal (Mar. 1, 2022); Guidelines for Evaluating Account and Services Requests, 87 Fed. Reg. 51099 (Aug. 19, 2022) (issuing the final Account Access Guidelines).

[76] *See* Nadav O. Peer, *Money Creation and Bank Clearing*, FORDHAM J. CORP. & FIN. L. (forthcoming 2023) (manuscript at 5), https://dx.doi.org/10.2139/ssrn.4090961 (describing the role central banks play in clearing payments between banks and emphasizing the importance of clearing in private money creation).

[77] *Fed Master Accounts Give FinTechs Firepower to Meet, and Beat, Banks on Their Own Payments Turf*, PYMNTS (Apr. 22, 2022), https://www.pymnts.com/bank-regulation/2022/fed-master-accounts-give-fintechs-firepower-to-meet-and-beat-banks-on-their-own-payments-turf/.

[78] *See* Brief of *Amicus Curiae* The Board of Governors of the Federal Reserve System in Support of Defendant-Appellee the Federal Reserve Bank of Kansas City at 14–15, *Fourth Corner Credit Union v. FRB*, 861 F.3d 1052 (10th Cir. 2017) (No. 16-1016); John Court & Dafina Stewart, *Putting the Horse Before the Cart: The First Rule of Granting Fed Accounts is Clarifying Who is Legally Eligible to Apply*, BANK POLICY INST. BLOG (June 14, 2021) (defending that the Federal Reserve Bank's decision is discretionary). *But see* Complaint at 4, *Custodia Bank, Inc. v. Fed. Rsrv. Bd. of Governors*, Case 1:22-cv-00125-SWS (D. Wyo. June 7, 2022) (arguing that the Fed has "a nondiscretionary duty to process applications for master accounts").

13(1) of the FRA gives room to different interpretations on which institutions are entitled to have a master account at the Reserve banks and is unclear on whether the Fed's decision to provide such an account is within its discretionary power.[79]

However, the public-private partnership between central banks, on one side, and banks and other financial institutions, on the other, should not inhibit central banks from promoting inclusive financial, monetary, and Payment Systems, either by stimulating and supporting innovation in private markets or by creating new structures and providing new services by themselves, leading the way toward innovation when needed.[80]

The preamble of the FRA states that the Fed was created "to provide the nation with a safer, more flexible, and more stable financial and monetary system," indicating that the financial system must support the country, and not the other way around.[81] The statutory reference to "flexibility" implies that innovation in the financial, monetary and Payment Systems is welcome, as long as the innovation is in the public interest. And because inclusive financial, monetary and Payment Systems result in collective gains, financial inclusion should be incorporated in every component of the Fed's mandate, including its role in the Payment System.[82]

In Brazil, financial inclusion is one of the principles by which payment schemes (*arranjos de pagamento*) and payment institutions (*instituições de pagamento*) must abide, alongside with the parameters established by the

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[79] *See* § 13(1) of the FRA, stating that "any Federal reserve bank may receive from any of its member banks, or other depository institutions, and from the United States, deposits of current fund in lawful money. . . ." *See* 12 U.S.C. § 342 (2018); *see also* Proposed Guidelines for Evaluating Account and Services Requests, 86 Fed. Reg. at 25867; Guidelines for Evaluating Account and Services Requests, 87 Fed. Reg. at 12959; Guidelines for Evaluating Account and Services Requests, 87 Fed. Reg. at 51099.

[80] *See* Robert C. Hockett & Saule T. Omarova, *Public Actors in Private Markets: Toward a Developmental Finance State*, 93 WASH. U. L. REV. 103, 105, 116 (2015) ("Our government is more than merely a market overseer and regulator—it is also a direct market participant, acting not only to correct market failures or to provide vital public goods but also to create, amplify, and guide private markets in ways that enhance these markets' potential to serve important long-term public interests.").

[81] Mehrsa Baradaran, *Examining Regulatory Frameworks for Digital Currencies and Blockchain: Hearing Before the S. Comm. on Banking, Hous. and Cmty. Affs.* 116th Cong. (2019) (statement of Mehrsa Baradaran, Professor of Law, University of California Irvine School of Law) (arguing that the Federal Reserve was established to increase the integrity, efficiency and equity of U.S. payments).

[82] Ulric Eriksson et al., *Digital Financial Inclusion in the Times of COVID-19*, INT'L MONETARY FUND: IMF BLOG (July 1, 2020) (arguing that financial inclusion is associated with higher economic growth and lower income inequality).

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central bank.[83] The BCB shall also adopt measures to promote competition, financial inclusion, and transparency in the provision of payment services.[84] Moreover, the BCB is required by law to encourage financial inclusion "by means of the participation of the telecommunications sector in the provision of payment services," and "may, based on periodic evaluations, adopt measures to encourage the development of payment schemes using access terminals to telecommunications services owned by the user."[85]

The BCB has sought to fulfill its financial inclusion mandate in payments by developing innovative policy initiatives that foment competition in the payments industry and make payment services more accessible.[86] One of these initiatives, based on the statutory authority granted by Law 12,865 of 2013 was the licensing of payment institutions, which, among other activities, can offer payment accounts (*contas de pagamento*) to individuals and businesses. Unlike banks, payment institutions cannot make loans and are required to keep deposits with the BCB, or invested in government securities, an amount equivalent to the amount customers have in the payment accounts. Considering these restrictions, payment institutions are subject to lower risks and, in turn, to less regulatory scrutiny than banks.[87]

Before payment institutions existed, the Brazilian financial system already had a national network of "banking correspondents," which are non-financial institutions, like small retailers and newsstands, that partner with banks to provide basic banking services beyond traditional branches.[88] Banking correspondents, however, are entities that provide services on behalf

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[83] Lei N° 12,865, de 9 de Outubro de 2013, Art. 7(VI), Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013, Art. 7(VI)] (Braz.).

[84] Law 12,865 of 2013, Art. 9(X).

[85] Law 12,865 of 2013, Art. 8.

[86] BANCO CENTRAL DO BRASIL, RELATÓRIO DE CIDADANIA FINANCEIRA 2021 [Financial Citizenship Report] (2021); ALLIANCE FOR FIN. INCLUSION, BANCO CENTRAL DO BRASIL, *Brazil: Financial Citizenship Journey in Brazil* (Aug. 2018).

[87] *See* MORGAN RICKS, THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION 5 (Univ. Chi. Press 2016) (pointing out that deposit banks are subject to an extensive regulatory regime because of their special role in money creation).

[88] The model of banking correspondents, adopted in Brazil in the late 1990s, allows agents to perform basic financial transactions, such as opening accounts, receiving deposits, offering withdrawals, and receiving small loans applications, on behalf of banks. Tania Pereira Christopoulos et al., *Evaluating Banking Agents: A Case of Brazilian Banking Correspondents*, 24.2 DLSU BUS. & ECON. REV. 92, 93 (2015).

of financial institutions licensed by the BCB.[89] Payment institutions, on the other hand, are themselves licensed by the BCB and can provide a wider range of payments services, thereby competing with banks and financial institutions.

Another BCB initiative related to financial inclusion is the launching of an open-finance project, preceded by an open-banking project initiated in 2020.[90] BCB's goal with open finance is to grant customers effective power over their financial data by removing the difficulties that hinder interoperability and data sharing among PSPs.[91] In late 2020, building on the banking correspondents' structure, the licensing of payment institutions and payment schemes, and the open-banking and open-finance projects, the BCB created an instant payments ecosystem, which includes Pix, the instant payments scheme, and SPI, the instant payment system.[92]

Assigning central banks not only regulatory responsibilities but also operation responsibilities in payment systems widens the range of possibilities in the use of innovation to facilitate financial inclusion.[93] Central banks' contemporary role as "innovative regulators" can go beyond driving innovation through regulation to include bringing innovation through direct operation in private markets.[94] To fulfill the mission of ensuring the

[89] Resolução CMN N° 4,935, de 29 de Julho de 2021, Arts. 23–25, Diário Oficial da União [D.O.U.] de 02.08.2021 [CMN Resolution 4,935 of July 29, 2021] (Braz.).

[90] Conselho Monetário Nacional-Banco Central Do Brasil, Resolução Conjunta N° 1, de 4 de Maio de 2020, Diário Oficial da União [D.O.U.] de 05.05.2020 [Joint Resolution CMN-BCB N° 1 of May 4, 2020] (Braz.), as amended by Conselho Monetário Nacional-Banco Central Do Brasil, Resolução Conjunta N° 4, de 24 de Março de 2022, Diário Oficial da União [D.O.U.] de 28.03.2022 [Joint Resolution CMN-BCB N° 4 of Mar. 24, 2022] (Braz.).

[91] Open finance is a set of rules, procedures and infrastructures, such as application programming interfaces (APIs), that enable consumers to freely access their financial data and share it with anyone, gaining access to better and cheaper financial products. *BIS Innovation Hub work on open finance*, BIS (2022), https://www.bis.org/about/bisih/topics/open_finance.htm.

[92] *See infra*, Part II.

[93] About the different roles central banks can play in the Payment System, see COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES, *Fast Payments—Enhancing the Speed and Availability of Retail Payments*, Annex 1 (Nov. 2016), https://www.bis.org/cpmi/publ/d154.pdf; Cozer, *supra* note 24 (arguing that central banks can act as regulators, operators, or catalysts in the Payment System).

[94] The expression "innovative regulator" ("*regulador inovador*") was employed in a publication by *Instituto Propague*, which describes the BCB's initiatives advancing innovation in the financial system, such as regulatory sandboxes, open-finance regulation, and the instant payments ecosystem. *See* CARLOS RAGAZZO ET AL. (eds.), O REGULADOR INOVADOR: BANCO CENTRAL E A AGENDA DE INCENTIVOS À INOVAÇÃO [The Innovative Regulator: Central Bank and the Innovation Incentives Agenda] (June 1, 2021) (ebook). *See also* Marcelo Lobato Bonson Santos, *Pix: O Banco Central enquanto um regulador*

soundness and efficiency of payment systems, central banks can themselves use innovation as an instrument to make payments easier, faster, reliable, and less costly for the public.[95]

In many jurisdictions, central banks are already acting proactively in payments, notably to enhance the capabilities of retail instant payment ecosystems and amplify the reach of central banks' actions, once limited to interbank payments, to end-to-end payments, which are to "entire payments supply chain and end users."[96] In this context, instant payments are especially relevant, as "a subset of payments in which an end user receives funds in near real time, with immediate interbank settlement of the payment also having occurred."[97]

Consider FedNow, an instant payments service the Fed is currently developing to provide consumers with real-time payments, with the intermediation of financial institutions.[98] Another example of central-bank focus on retail payments is India's Unified Payments Interface (UPI) rail, an instant real-time payment system developed by the National Payments Corporation of India (NPCI), a non-profit owned by the central bank (the

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inovador no mercado de pagamentos de varejo Brasileiro [Pix: The Central Bank as an innovative regulator in the Brazilian retail payments market], MERCADOS DIGITAIS: O LIVRO DA DISCIPLINA [DIGITAL MARKETS: THE COURSEBOOK] 499–579 (Leandro Novais e Silva & Luiz Felipe Drummond Teixeira eds., 2022) (stating that, with Pix, the BCB played the role of an innovative regulator in the retail payments market by acting proactively in instant payments, even in the absence of express legal authority).

[95] *See* EUR. CENT. BANK—EURO SYSTEM, *supra* note 16.

[96] For an illustration of this shift in central banks' focus, see Sandra Pianalto, Collaborating to Improve the U.S. Payment, Speech at the Federal Reserve Bank of Chicago Payments Conference (Oct. 22, 2012) (transcript available at https://www.clevelandfed.org/en/newsroom-and-events/speeches/sp-20121022-collaborating-to-improve-the-us-payments-system.aspx) ("Historically, the Federal Reserve's focus has been on the interbank market, although changes in that market have had broader effects. The Federal Reserve's strategy today is to place greater emphasis on the entire payments supply chain and end users. Said another way, our strategy is to focus on payments from end-to-end. . . . With this end-to-end focus, the Federal Reserve will work closely with banks and others who provide payment services directly to end users. As an intermediary, we can play a crucial role in shaping the end-user payment experience.").

[97] Service Details on Federal Reserve Actions to Support Interbank Settlement of Instant Payments, 85 Fed. Reg. 48522 (Aug. 11, 2020). Under Brazilian law, instant payment is the "electronic fund transfer where the transmission and availability of funds to the payee user happens in real time, and whose services are available 24 hours a day, every day of the year." Resolução BCB N° 195, de 3 de Março de 2022, Art. 2, Diário Oficial da União [D.O.U.] de 07.03.2022 [BCB Resolution 195 of Mar. 3, 2022] (Braz.).

[98] According to the Fed, FedNow is launching in 2023. *About the FedNow Service*, THE FEDERAL RESERVE (2022).

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Reserve Bank of India, or RBI) and fifty-six commercial banks, in operation since 2016 and regulated by the RBI.[99]

Fintech intends to revamp the financial system and promises to make money, banking, and payments more democratic and inclusive.[100] Cryptocurrencies go even further, ambitioning to disrupt the existing monetary constitution and challenge the supremacy of sovereign money.[101] Central banks can only justify their centrality in the monetary system if they use financial innovation to benefit the public and ensure the private sector does so as well.[102] Central-bank innovation starts with revisiting the weight of private and public participation in the Payment System and the relationship between money, banking, and payments.[103] Retail instant payments

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[99] DERRYL D'SILVA ET AL., BANK FOR INT'L SETTLEMENTS, THE DESIGN OF DIGITAL FINANCIAL INFRASTRUCTURE: LESSONS FROM INDIA 16, 17 (Dec. 2019).

[100] For a critique of the revolutionary aspirations of the fintech sector and its disintermediation rhetoric, see Hockett & Omarova, *supra* note 71, at 1201–02.

[101] Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2008), www.bitcoin.org/bitcoin.pdf. *But see* Martin Wolf, *The Libertarian Fantasies of Cryptocurrencies*, FIN. TIMES (Feb. 12, 2019) (positing that, because money is a public good, the state should have a role in money and finance); Ian Bogost, *Cryptocurrency Might Be a Path to Authoritarianism*, THE ATLANTIC (May 30, 2017) (arguing that distributed-ledger systems may enable big corporations and governments to exercise more central control over citizens, thus consolidating these institutions' power and defeating Bitcoin's libertarian aspiration).

[102] Updating existing regulations is one of the steps central banks and other financial regulators must take to ensure technological progress does not result in financial exclusion. The U.S. financial regulators, for example, have issued a proposal to modernize the regulations implementing the Community Reinvestment Act of 1977 (CRA), which requires regulators to assess financial institutions' records in serving their local communities, with focus on low- and moderate-income communities. One of the proposal's aim is to adapt the CRA to changes like internet and mobile banking. *See* Community Reinvestment Act, 87 Fed. Reg. 33964 (June 3, 2022); Press Release, Bd. of Governors of the Fed. Res. Sys., Agencies issue joint proposal to strengthen and modernize Community Reinvestment Act Regulations (May 5, 2022).

[103] *See* Dan Awrey, *Unbundling Banking, Money, and Payments* (European Corporate Governance Institute, Law Working Paper No. 565, 2021); Adam Levitin, *Safe Banking: Finance and Democracy*, 83 U. CHI. L. REV. 357 (2016) (about fintech's potential to unbundle the various services conventional banks and other financial institutions provide, such as deposit-taking and commercial lending, therefore allowing for the separation of the systems of banking, money, or payments).

ecosystems, in turn, are laboratories for this innovative version of central banks.[104] And Pix, from Brazil, is a case in point.[105]

II. PIX: THE CENTRAL BANK LEADING A PAYMENTS REVOLUTION IN BRAZIL

A. Pix's Structure and Functioning

Under Brazilian law, a payment scheme is a "set of rules and procedures regulating the provision to the public of certain payment services that are accepted by more than one payee, via direct access by end users, either payers or payees."[106] A "payment scheme" differs from a "payment system," which is the infrastructure that ultimately settle transactions by transferring funds from one person or institution to another.[107] A "payment scheme" itself does not settle transactions—it is a combination of rules and procedures that PSPs follow to exchange the end-user data needed for later completing the transfer of funds.[108] The transfer of funds, which comprehends the payment's clearance and settlement among the PSPs or their correspondents, occurs in a payment system.[109]

In November 2020, the BCB launched Pix, a payment scheme that supports retail instant payments, with settlement in real time and availability

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[104] Adrienne A. Harris & Michael S. Barr, *Central Bank of the Future Project Brief & Overview*, CTR. ON FIN., LAW & POL'Y (Dec. 3, 2018) (explaining that an innovative central bank is the "central bank of the future," or "a central bank that would enable development of inclusive financial systems and inclusive digital economies that serve all, including the poor").

[105] *End User*, Bank for International Settlements Committee on Payments and Market Infrastructures Glossary (last visited Nov. 12, 2022) (explaining that an end user is "a customer of a financial institution (or a payment institution) to which the financial institution (or payment institution) provides payment instruments and services to facilitate the completion of its transactions").

[106] Lei N° 12,865, de 9 Outubro de 2013, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013] (Braz.).

[107] *See* Part I.A, *supra*, for a definition of "payment system."

[108] *See* EUR. PAYMENTS COUNCIL, *What is a Payment Scheme?* (defining a payment scheme as "a set of rules which PSPs have agreed upon to execute transactions through a specific payment instrument," in contrast with a "payment system, which is a technical infrastructure that processes transactions in line with the rules defined in a payment scheme").

[109] *Clearing*, Bank for International Settlements Committee on Payments and Market Infrastructures Glossary (last visited Nov. 12, 2022); Settlement is "the discharge of an obligation in accordance with the terms of the underlying contract." *Settlement*, Bank for International Settlements Committee on Payments and Market Infrastructures Glossary (last visited Nov. 12, 2022) (clearing is "the

24/7/365.[110] In Pix transactions, funds must be available in the payee's account within ten seconds for 99% of transactions and within six seconds for 50% of transactions.[111] Pix transactions must be settled within forty seconds.[112] Contrary to other payment schemes owned and managed by private institutions like Visa and Mastercard, Pix was created and is owned and managed by the BCB.[113] The BCB alone sets and enforces the rules and technical specifications for payment services processed via Pix[114] and has the sole authority to admit Pix participants based on the criteria it established.[115]

To use Pix, payors and payees must hold a transaction account, which can be a personal checking account, a savings account, or a payment account.[116] Checking accounts and savings accounts are deposit accounts held with financial institutions, such as commercial banks, saving banks, and credit unions.[117] Payment accounts, in turn, are held with payment institutions.[118] Payment institutions are non-financial institutions, created by Law 12,865 of 2013, which exercise activities related to the provision of payment services, such as providing cash-in and cash-out services, performing or facilitating payment instructions, managing payment accounts, issuing or acquiring payment instruments, facilitating remittances, and

process of transmitting, reconciling and, in some cases, confirming transactions prior to settlement, potentially including the netting of transactions and the establishment of final positions for settlement").

[110] Pix was created by Resolução BCB N° 1, de 12 de Agosto de 2020, Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.).

[111] Breno S. Lobo & Carlos E. Brandt, *Pix: The Brazilian Fast Payment Scheme*, 15(4) J. PAYMENTS STRATEGY & SYS. 367, 368 (2021); *see generally* BANCO CENTRAL DO BRAZIL, RELATÓRIO DE ECONOMIA BANCÁRIA 2020 [Banking Economy Report 2020] (2021).

[112] Instrução Normativa BCB N° 243, de 16 de Março de 2022, Diário Oficial da União [D.O.U.] de 17.3.2022 [BCB Normative Instruction 243 of Mar. 16, 2022] (Braz.).

[113] *Pix, FAQ, 1-Understanding how Pix works, 1-What is Pix?*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/financialstability/pixfaqen (last updated Nov. 2020); Banco Central do Brasil, *Pix*, BCB's Role, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/financialstability/pixcentralbanksrole (last visited Nov. 12, 2022).

[114] Angelo Duarte et al., *Central Banks, the Monetary System and Public Payment Infrastructures: Lessons from Brazil's Pix*, BIS Bulletin No. 52, 5 (Mar. 23, 2022).

[115] *See* Resolução BCB N° 1, Pix Rules, Arts. 24–25, de 12 de Agosto de 2020, Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.).

[116] *See* Lei N° 12,865, de 9 de Outubro de 2013, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013] (Braz.).

[117] *Perguntas e Respostas*, BANCO CENTRAL DO BRASIL: CONTAS DE DEPÓSITO [Deposit Accounts: Questions and Answers] Questions 1–2 (Jan. 2020), https://www.bcb.gov.br/acessoinformacao/perguntasfrequentes-respostas/faq_contasdedeposito.

[118] *See* Part I.B, *supra*.

converting physical or scriptural money into electronic money, or vice-versa.[119] Payment institutions in Brazil are not allowed to perform functions that are typical of financial institutions, which essentially means that they cannot extend credit or grant loans.[120]

All payment institutions that hold payment accounts can be Pix participants, even if they are not licensed by the BCB.[121] Non-licensed payment institutions that join Pix as participants become part of the Brazilian Payment System and must comply with a lighter version of central bank regulation with respect to operational and liquidity risk management, cybersecurity policy and KYC/AML policy.[122] Joining Pix as a participant was mandatory for all financial institutions and payment institutions with more than 500,000 accounts and optional for other financial and payment institutions and the Brazilian Treasury Department.[123]

Pix users can make payments by (i) entering an alias that identifies the payee, called a "Pix key" (*Chave Pix*); (ii) reading a static or dynamic quick response (QR) code generated by the payee;[124] or (iii) entering manually the payee's detailed transaction-account information.[125] Users can register a Pix key at the PSP where they hold their transaction account. The alias corresponding to the Pix key can be the user's taxpayer identification number (CPF or CNPJ), their email address, a cell-phone number, or a random key, made of thirty-two characters with letters and symbols randomly generated by the BCB.

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[119] *See* Law 12,865 of 2013, Art. 6(III).

[120] *Id.* art. 6 § 2; The legal definition of "financial institution" in Brazil is controversial, but CMN and BCB regulations interpret that, under Law 4,595 of 1964, and Law 7,492 of 1986, Art. 17, credit intermediation is the distinctive feature of a financial institution. *See also Instituições de Pagamento*, BANCO CENRAL DO BRASIL [Payment Institutions] (2022), https://www.bcb.gov.br/estabilidadefinanceira/instituicaopagamento.

[121] *See* Resolução BCB N° 1, de 12 de Agosto de 2020, Art. 3 § 3, Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.).

[122] BCB Resolution 1 of 2020, Art. 3 §§ 4–5.

[123] *Id.* art. 3.

[124] A static QR code is a printed image of the payee's QR code, which is the same for every transaction entered with that payee. A dynamic QR code is a QR that is generated in real time for each transaction, at the moment of payment. CONSULTATIVE GRP. TO ASSIST THE POOR, ACCEPTANCE TECHNOLOGIES FOR MERCHANT PAYMENTS, CGAP: RESEARCH AND ANALYSIS PUBLICATION (Oct. 2019), https://www.cgaatorg/research/publication/acceptance-technologies-merchant-payments.

[125] BCB Resolution 1 of 2020, Pix Rules, Art. 5(I)–(II).

The Pix key links the alias to information about the user's transaction account, such as identification of the financial or payment institution in which the account is held, account number, and account type. Each transaction account can be linked up to five Pix keys, for accounts held by natural persons, and up to twenty keys, for accounts held by legal entities. Each key can be linked to only one transaction account, but a user can register different keys and connect each of them to a separate transaction account. Users with transaction accounts in different institutions are entitled to port their Pix key from one financial or payment institution to another and link their Pix key to a different transaction account. As of December 31, 2022, more than 550 million Pix keys were registered in the Pix ecosystem, which is a number equivalent to more than two times the Brazilian population.[126]

Making and receiving payments via Pix is free for individuals, in contrast to the traditionally expensive wire transfer payment methods such as TED (*transferência eletrônica disponível*) and DOC (*documento de ordem de crédito*).[127] Businesses can also make or receive Pix payments free of charge, but are often charged fees by their financial or payment institution when making or receiving Pix payments. In general, Pix transactions are not limited by a minimum or maximum amount or number of transactions, although PSPs and users may set an amount limit for transactions to avoid fraud and comply with KYC/AML legislation.[128] PSPs can set such limitations as long as they follow the same parameters applicable to other means of payments that are similar to Pix.[129] For safety reasons, a PSP that holds the payer's or the payee's transaction account shall reject a Pix transaction when it justifiably suspects fraud.[130] In this case, in order to assess the transaction's legitimacy, the PSP providing the payee's transaction

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[126] *Pix Statistics: Keys by Type*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/financialstability/pixstatistics (last visited Jan. 21, 2023).

[127] *See* Resolução BCB N° 19, de 1 de Outubro de 2020, Art. 1, Diário Oficial da União [D.O.U.] de 2.10.2020 [BCB Resolution 19 of Oct. 1, 2020] (Braz.); *see also Perguntas e Respostas*, BANCO CENTRAL DO BRASIL: PAGAMENTO INSTANTÂNEO (PIX) [Instant Payment (Pix): Questions and Answers] Question 8 (Jan. 2023), https://www.bcb.gov.br/estabilidadefinanceira/.

[128] BCB Resolution 1 of 2020, Pix Rules, Arts. 37–37A; *see also* Instrução Normativa BCB N° 331, de 1 de Dezembro de 2022, Diário Oficial da União [D.O.U.] de 2.12.2021 [BCB Normative Instruction 331 of Dec. 1, 2022] (Braz.).

[129] BCB Resolution 1 of 2020, Pix Rules, Art. 37.

[130] BCB Resolution 1 of 2020, Pix Rules, Arts. 38(II)–39(I).

account shall hold the corresponding payment for up to seventy-two hours, if the payee is an individual.[131]

The BCB has designed the application programming interface (API) to be used with Pix, making the Pix API standards mandatory for all participants, with a minimum of functionalities.[132] Participants are required to provide Pix users with a simple, accessible, secure, fast, accurate, smooth, transparent, and convenient experience, with clear language being included in the commands used to complete Pix transactions.[133] Pix's friendly interface, combined with the use of aliases for transfers, allows users to enjoy a much easier payment experience compared to traditional electronic payment methods, such as wire transfers and bank slips (*boleto bancário*).[134]

The underlying payment system where Pix transactions are settled and funds are transferred is the Instant Payment System (*Sistema de Pagamentos Instantâneos*, or SPI), also created, owned and managed by the BCB.[135] SPI, a "Real-Time Gross Settlement" (RTGS) payment system that settles retail transactions in real time, was launched in November 2020.[136] Financial and payment institutions that are Pix participants are required to join the SPI in one of two ways: directly, by keeping their own settlement account at the SPI, or indirectly, via a direct SPI participant.[137] The account held by an SPI direct participant is called PI Account (*Conta de Pagamentos Instantâneos*,

[131] BCB Resolution 1 of 2020, Pix Rules, Art. 39-B. Because settlement is irreversible and takes place in almost real time in instant payments, preventive measures to delay settlement are needed to address fraud concerns. *See* Kate Fitzgerald, *Raising Zelle: Furious P2P Users Take Banks to Court*, AM. BANKER (June 7, 2022), https://www.americanbanker.com/payments/news/raising-zelle-furious-p2p-users-take-banks-to-court; Stacy Cowley & Lananh Nguyen, *Fraud Is Flourishing in Zelle. The Banks Say it's Not Their Problem*, THE N.Y. TIMES (Mar. 6, 2022), https://www.nytimes.com/2022/03/06/business/payments-fraud-zelle-banks.html.

[132] BCB Resolution 1 of 2020, Pix Rules, Art. 3(XXIII).

[133] BCB Resolution 1 of 2020, Pix Rules, Art. 86.

[134] *Pix Frequently Asked Questions, 2—Understanding the Difference Between Pix and Other Payment Methods (TED, DOC, Bank Slips and Cards)*, BANCO CENTRAL DO BRAZIL, https://www.bcb.gov.br/en/financialstability/pixfaqen (last accessed Jan. 5, 2023).

[135] BCB Resolution 1 of 2020, Pix Rules, Art. 33.

[136] BCB's Role, *supra* note 113. *See also* Resolução BCB N° 195, de 3 de Março de 2022, Rules for SPI and PI Accounts, Art. 2(I), Diário Oficial da União [D.O.U.] de 07.03.2022 [BCB Resolution 195 of Mar. 3, 2022] (Braz.); *see also* BANCO CENTRAL DO BRAZIL COMMUNIQUÉ NO. 32,927 OF DECEMBER 21ST, 2018, ¶ 6 (Gabin Deban trans., 2019) (Braz.), https://www.bcb.gov.br/content/financialstability/Communiques_ps_docs/Communique_32927.pdf (stating that transactions processed in Pix "will be settled one by one at the time the settlement order is accepted by the infrastructure").

[137] BCB Resolution 195 of 2022, Rules for SPI and PI Accounts, Arts. 13(I)–14.

or *Conta PI*).[138] The PI Account's balance may not be negative,[139] and the BCB acts as a liquidity provider to direct SPI participants outside the regular hours of transactions in the STR, via reverse repurchase agreements involving federal government securities.[140]

The BCB has also created the alias database that Pix uses, named Transaction Accounts Identifier Directory (*Diretório de Identificadores de Contas Transacionais*, or DICT).[141] DICT stores all the information a Pix user chooses to link to their Pix key, allowing Pix to connect the user's identification to their corresponding transaction account with safety and ease.[142] The storage of Pix keys at DICT simplifies the process of payment initiation and mitigates the risk of fraud.[143]

Figure 1 shows the participation modes in Pix and SPI, which are situated in different levels, according to the size and nature of the financial and payment institutions. As of December 31, 2022, a total of 793 financial and payment institutions were Pix participants.[144]

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[138] *Id.* art. 2(VI).

[139] *Id.* art. 22, § 1.

[140] Resolução BCB N° 175, de 15 de Dezembro de 2021, Rules, Arts. 14–18, Diário Oficial da União [D.O.U.] de 17.12.2021 (Braz.) [BCB Resolution 175 of Dec. 15, 2021]. *See also* Rubia C. Neves et al., *Pontuais Alterações na Estrutura do SPB para Implantar o SPI/Pix e Seus Benefícios para a População*, REVISTA DA PROCURADORIA-GERAL DO BANCO CENTRAL [PGBC MAGAZINE], June 2021, at 31, 39–40 (Braz.), https://revistapgbc.bcb.gov.br/revista/article/view/1102/3.

[141] Resolução BCB N° 1, de 12 de Agosto de 2020, Pix Rules, Art. 3(VIII), Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.). *See also* BCB, COMMUNIQUÉ NO. 34,085 OF AUGUST 28TH, 2019 (Braz.), https://www.bcb.gov.br/estabilidadefinanceira/exibenormativo?tipo=Comunicado&numero=34085 (updating the guidelines for the Brazilian instant payments ecosystem to establish the need for creation of a centralized database in the ecosystem's structure, containing the Pix keys that allow the identification of the end users' transaction accounts).

[142] BCB Resolution 1 of 2020, Pix Rules, Arts. 3(I), 14. *See also Agenda BC# Competitividade, Inovações*, BANCO CENTRAL DO BRASIL, (Braz.), https://www.bcb.gov.br/acessoinformacao/bcmais_competitividade?modalAberto=competitividade_inovações (last visited Dec. 20, 2022).

[143] *End Users' Identification, Safety*, BANCO CENTRAL DO BRASIL (Braz.), https://www.bcb.gov.br/en/financialstability/pix_en (last visited Dec. 20, 2022).

[144] *Pix Statistics, Participants by Institution Type: Aug. 31, 2022*, BANCO CENTRAL DO BRASIL (Braz.), https://www.bcb.gov.br/en/financialstability/pixstatistics (last visited Jan. 21, 2023).

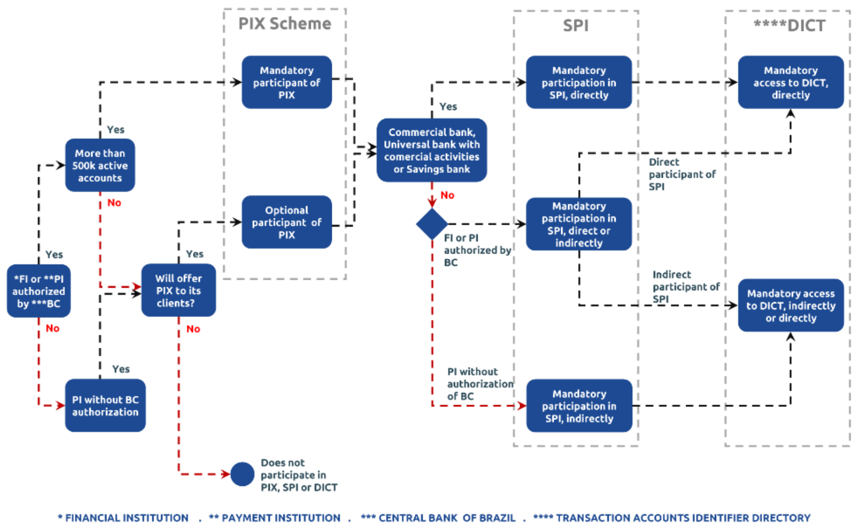

Figure 1—Pix and SPI Participation[145]

Figure 2, in turn, shows that the institution that holds the user's transaction account (the "transaction account provider") can transfer funds via Pix directly or indirectly, through either a "payment initiator," or a "special settlement agent," or both.[146] A payment initiator is a payment institution licensed by the BCB exclusively to provide services related to the initiation of payment transactions.[147] A payment initiator is also considered a Pix participant and must comply with Pix regulations issued by the BCB.[148] A special settlement agent is a financial or payment institution that provides settlement services to Pix's indirect SPI participants, those that do not hold a PI Account at the SPI.[149]

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[145] *Instant Payment System*, BANCO CENTRAL DO BRASIL (Braz.), https://www.bcb.gov.br/en/financialstability/spi_en (last visited Dec. 20, 2022).

[146] BCB's Role, *supra* note 113.

[147] Resolução BCB N° 80, de 25 de Março de 2021, Art. 3(IV), Diário Oficial da União [D.O.U.] de 29.03.2022 [BCB Resolution 80 of Mar. 25, 2021] (Braz.).

[148] Resolução BCB N° 118, de 22 de Julho de 2021, Art. 1, Diário Oficial da União [D.O.U.] de 23.07.2022 [BCB Resolution 118 of July 22, 2021] (Braz.).

[149] Resolução BCB N° 195, de 3 de Março de 2022, Rules for SPI and PI Accounts, Art. 2(IX), 14(II), Diário Oficial da União [D.O.U.] de 07.03.2022 [BCB Resolution 195 of Mar. 3, 2022] (Braz.).

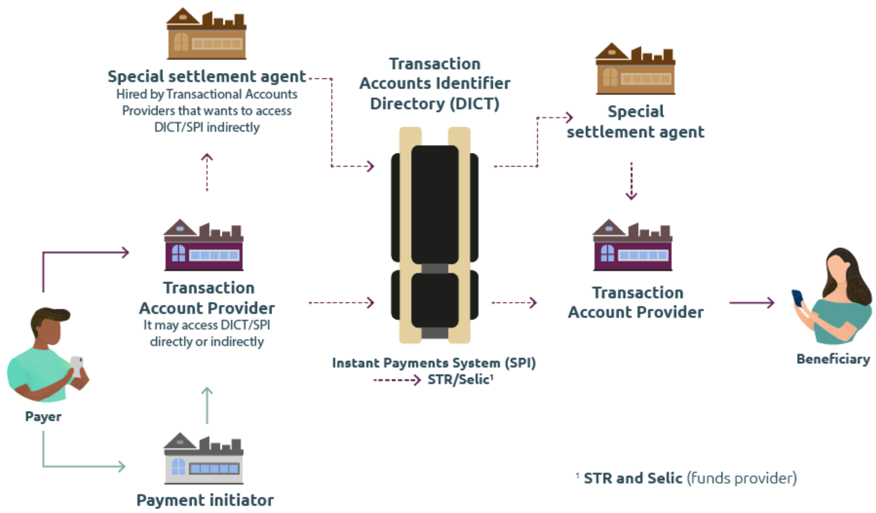

Figure 2—Pix Operational Framework[150]

Together, Pix, SPI and DICT integrate the Brazilian instant payments ecosystem, fully created and operated by the BCB. The BCB has built the Brazilian instant payments ecosystem to advance the competition and financial inclusion dimensions of its innovation agenda,[151] called *Agenda BC#*, which also has three other dimensions: transparency, education, and sustainability.[152] The BCB intends to pursue the five dimensions of its agenda "through fostering technological innovation," which implies the central bank's understanding that, to fulfill this mission in the financial, monetary and Payment Systems, its tools are not limited to conventional regulation.[153] Within its legal mandate, the BCB has innovated in payments not only by

[150] BCB's Role, *supra* note 113.
[151] COMMUNIQUÉ NO. 32,927, *supra* note 136.
[152] *See generally About Agenda BC#*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/about/bcbhashtag?modalAberto=about_agenda (last visited Dec. 20, 2020).
[153] COMMUNIQUÉ NO. 32,927, *supra* note 136.

issuing regulations and catalyzing innovation in private markets but by directly creating and operating payment systems and a payment scheme.[154]

B. Central Bank of Brazil: An Innovator in the Instant Payments Ecosystem

Central banks have played an essential role in the development and operation of retail instant payments systems, schemes, and infrastructures, following approaches and degrees of intervention in private markets that vary across jurisdictions.[155]

Pix is an example of a central bank innovating in the retail payments ecosystems by developing and operating payment systems and payment schemes, apart from establishing a regulatory framework that incentivizes innovation coming from the private sector. According to a survey conducted by the Committee on Payments on Market Infrastructures (CPMI) in 2019–2020, BCB's role in the operation of fast payment systems is classified as "fully active," a category that designates the highest degree of a central bank's involvement with the jurisdiction's fast payments ecosystem.[156] For the CPMI survey, a "fully active" role means that central bank owns or operates the fast payment system, or both.[157] Under the terminology adopted in the survey, the Brazilian fast payment system corresponds to the combination of the payment scheme (Pix) with the payment system deliberately created to underpin it (SPI).

Pix's creation was the central bank's response to the high level of concentration and verticalization in the card payment schemes' space, high fees imposed on merchants to receive payments made with credit and debit cards, and a lack of interoperability between different private payment providers, especially due to the use of different POS networks.[158] In

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[154] *See* Breno S. Lobo, *Moral Suasion and Legal Enforcement in the Reform of Retail Payments in Brazil*, 10 J. PAYMENTS STRATEGY SYS. 333 (2017); *see also* Santos, *supra* note 94.

[155] COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES, BANK FOR INT'L SETTLEMENTS, DEVELOPMENTS IN RETAIL FAST PAYMENTS AND IMPLICATIONS FOR RTGS SYSTEMS 13 (2021), https://www.bis.org/cpmi/publ/d201.pdf.

[156] *Id.* at 14.

[157] *Id.* at 13.

[158] *See* BANCO CENTRAL DO BRASIL, DIAGNÓSTICO DO SISTEMA DE PAGAMENTO DE VAREJO NO BRASIL 76 [Diagnosis of the Retail Payment System in Brasil] (2005), https://www.bcb.gov.br/content/estabilidadefinanceira/Publicacoes_SPB/Diagnostico%20do%20Sistema%20de%20Pagamentos%20de%20Varejo%20no%20Brasil.pdf; *see generally* SECRETARIA DE DESENVOLVIMENTO ECONÔMICO (SDE),

payments, interoperability—a payment system's ability to process and complete transactions initiated by different payment providers—is essential to achieve efficiency and ubiquity.[159] It improves financial viability, information and communications technology infrastructures, payment product design, and accessibility to transactional accounts.[160] Therefore, interoperability furthers financial inclusion in retail payments, by promoting competition, reducing costs, and making payment services more convenient, easier and faster.[161]

Before deciding to create Pix, the BCB had incentivized self-regulation among the providers to enhance interoperability and the creation of a private payment scheme capable of supporting retail payments settled in real time and available 24/7/365.[162] It had also put caps on the interchange fees assessed by credit and debit cards companies and issued regulations that welcomed the arrival of new entrants in the card market, making use of the legal authority regarding payment institutions and payment schemes stemming from Law 12,865 of 2013.[163] After identifying these market failures and realizing that nudging the private sector into action was not enough to address them, the BCB decided to lead the process of creating an instant payments ecosystem. BCB's plan was to coordinate market agents

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BANCO CENTRAL DO BRASIL & SECRETARIA DE ACOMPANHAMENTO ECONÔMICO (SAE), RELATÓRIO SOBRE A INDÚSTRIA DE CARTÕES DE PAGAMENTO [Secretariat for Economic Development, Central Bank of Brazil, and Secretariat for Economic Monitoring: Report on the Payment Card Industry] (2010), https://www.bcb.gov.br/content/estabilidadefinanceira/Publicacoes_SPB/Relatorio_Cartoes.pdf.

[159] CAROL BENSON & NILS CLOTTEAU, INT'L TELECOMM. UNION, DIGITAL FINANCIAL SERVICES GLOSSARY 11 (2017), https://www.itu.int/en/ITU-T/focusgroups/dfs/Documents/201701/ITU_FGDFS_DFS-Glossary.pdf.

[160] COMM. PAYMENTS MKT. INFRASTRUCTURES, BANK FOR INT'L SETTLEMENTS & WORLD BANK GROUP, PAYMENT ASPECTS OF FINANCIAL INCLUSION 34 (2016), https://www.bis.org/cpmi/publ/d144.pdf.

[161] *See generally* DANIEL GERSTEN REISS & RICARDO TEIXEIRA LEITE MOURÃO, INT'L TELECOMM. UNION, THE REGULATOR'S PERSPECTIVE ON THE RIGHT TIMING FOR INDUCING INTEROPERABILITY: FINDINGS OF A SURVEY AMONG FOCUS GROUP MEMBERS (2017), https://www.itu.int/en/ITU-T/focusgroups/dfs/Documents/201702/ITU_FGDFS_Report-Right-Timing-for-Inducing-Interoperability.pdf.

[162] BANCO CENTRAL DO BRASIL, RELATÓRIO DE VIGILÂNCIA DO SISTEMA DE PAGAMENTOS BRASILEIRO [Report on the Oversight of the Brazilian Payment System] 22–23 (2013), https://www.bcb.gov.br/content/estabilidadefinanceira/spb_docs/RELATORIO_DE_VIGILANCIA_SPB2013.pdf.

[163] *Id.*

and conceive a neutral, competitive, and efficient ecosystem, all conducive to interoperability.[164]

Against this backdrop, the BCB led the development of the Brazilian instant payment ecosystem. However, regulated institutions in the Payment System, other participants in the payments industry, and end users have engaged in the discussions and formulation of guidelines from the beginning of the process.[165] Dialogue with the private sector has provided the BCB with valuable information and non-binding advice about market deficiencies, unmet demand, interoperability issues, and network effects, informing the design of the ecosystem and democratizing decision-making.[166]

In 2015, the BCB created the AIP Forum, a communication channel with private institutions that provide services in the Payment System to discuss issues related to payment schemes and payment institutions.[167] In

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[164] BD. OF GOVERNORS OF THE CENT. BANK OF BRAZIL, VOTO 271/2018-BCB DE 20 DE DEZEMBRO DE 2018 §§ 3, 12, 13, https://normativos.bcb.gov.br/Votos/BCB/2018271/Voto_2712018_BCB.pdf (Reasoning Statement (*Exposição de Motivos*) to Communiqué BCB 32,927 of 2018).

[165] In 2015, the Fed established a similar working group, called Faster Payments Task Force, to elicit stakeholder perspectives and "identify and evaluate alternative approaches for implementing safe, ubiquitous, faster payments capabilities in the United States." This task force was preceded by an industry relations program engaging payment stakeholders and by the publication of a Fed consultation paper in 2013, soliciting feedback from the public. *See generally* FASTER PAYMENTS TASK FORCE, *Mission and Objectives*, https://fasterpaymentstaskforce.org/meet-the-task-force/mission-and-objectives/ (last visited Dec. 20, 2022); *see also* FED. RSRV. SYSTEM, STRATEGIES FOR IMPROVING THE U.S. PAYMENT SYSTEM (2015), App. 1. (Stakeholder Engagement Efforts), https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf. Another example of participatory decision-making about instant payments in central banks comes from the Eurozone: the ECB created the Euro Retail Payments Board (ERPB), a body dedicated to foster integration, innovation and competitiveness of euro retail payments in the European Union. The ERPB is chaired by an ECB representative and comprises, on the supply side of the market, members from the PSP community, the banking industry, the payment institutions, and the e-money industry, and, on the demand side, representatives of consumers, retailers, businesses, and national public administrations. National central banks from the ESCB and one national central bank from the non-euro community also participate in the ERPB, on a rotational basis, and the European Commission can attend the meetings as an observer. *See generally* EUR. CENT. BANK, COMPOSITION OF THE EURO RETAIL PAYMENTS BOARD (ERPB) (2021), https://www.ecb.europa.eu/paym/groups/erpb/shared/pdf/ERPB_composition.pdf.

[166] *See generally* Saule T. Omarova, *Bankers, Bureaucrats, and Guardians: Toward Tripartism in Financial Services Regulation*, 37 J. CORP. L. 621 (2012) (defending the inclusion of a designated public interest representative as an equal third party in the regulatory process).

[167] Portaria BCB N° 85,478, de 23 de Junho de 2015, Arts. 1(II), 3, Diário Oficial da União [D.O.U.] de 24.6.2015 [BCB Ordinance 85,478 of June 23, 2015] (Braz.); *see also* BANCO CENTRAL DO BRASIL, RELATÓRIO DE VIGILÂNCIA DO SISTEMA DE PAGAMENTOS BRASILEIROS 11 [Brazilian Payment System Surveillance Report] (2015), https://www.bcb.gov.br/content/estabilidadefinanceira/spb_docs/Relatorio_de_Vigilancia_do_SPB_2015.pdf.

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2018, the BCB established the "Working Group on Instant Payments" (*GT—Pagamentos Instantâneos*), comprised of representatives from the BCB, other government entities, and the payments industry, whose mission was to identify the requirements to develop an instant payments ecosystem that would be competitive, efficient, secure, and inclusive.[168] The working group was open to any institution and even allowed contributions from individuals.[169] Building on the working group's findings, the BCB set out the guidelines for the Brazilian instant payments ecosystem. This makes clear the BCB's active role in the process, as a leader, coordinator, developer, operator, and regulator.[170]

According to the instant payments ecosystem initial guidelines, the BCB would "lead the instant payments development in Brazil, with the objective of creating, from a neutral perspective in relation to specific business models or market participants, the necessary conditions for the development of an efficient, competitive, secure, and inclusive instant payments ecosystem, that accommodates all use cases."[171] Moreover, the BCB stated that the instant payments ecosystem regulations would be issued by the central bank, but the rulemaking process would take place in consultation with the private sector, with transparency and adequate representation of the various constituents in the ecosystem.[172]

In 2019, the BCB created the PI Forum (*Fórum PI*), an advisory committee that provides the BCB with information about challenges and opportunities in the instant payments segment of the Payment System.[173] The PI Forum was later renamed Pix Forum (*Fórum Pix*) and currently includes representatives of the BCB, PSPs, information technology services providers, and end users, with four working groups in progress—Business (*Negócios*), Standards and Technical Requirements (*Padronização e Requisitos Técnicos*), IP Messages (*Mensagens PI*), and Safety

[168] Portaria BCB Nº 97,909, de 3 de Maio de 2018, Diário Oficial da União [D.O.U.] de 07.05.2018 [BCB Ordinance 97,909 of May 3, 2018] (Braz.); *see also* BANCO CENTRAL DO BRASIL, *supra* note 113.
[169] BD. OF GOVERNORS OF THE CENT. BANK OF BRAZIL, *supra* note 164, § 9 at 41.
[170] *See id.*
[171] *See id.* § 2 at 51.
[172] *See id.* §§ 3 and 4.
[173] Portaria BCB Nº 102,166, de 19 de Março de 2019, Diário Oficial da União [D.O.U.] de 20.03.2019 [BCB Ordinance 102,166 of Mar. 19, 2019] (Braz.); *see also* BANCO CENTRAL DO BRASIL, *supra* note 113.

(*Segurança*).[174] Finally, the BCB regulations that created Pix in 2020 were preceded by a notice and comment period, during which the private sector offered comments, criticism and suggestions to the proposed regulations.[175]

According to the BCB, Pix's main goals are to promote financial inclusion and foster market competition in payments.[176] The data has indicated progress toward achieving these goals and Pix's adoption numbers are increasing rapidly. Only two months after Pix was launched, around 180 million address keys (*Chaves Pix*) had been registered, most of them belonging to individuals.[177] In just over one year of operation, around 104 million natural persons had already used Pix at least once—more than 60% of the adult population in Brazil.[178] In December 2022 alone, a record of 2.88 billion transactions took place via Pix, with the record number of 104.1 million transactions in only one day, December 20.[179] Pix has gained significant space in the retail digital payments' market, having surpassed credit and debit cards as the most popular payment method in Brazil.[180] The graphs below illustrate Pix's fast growth, especially among individuals:

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[174] *Fórum Pix*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/estabilidadefinanceira/forumpagamentosinstantaneos (last visited Dec. 20, 2022); *see also* Lobo & Brandt, *supra* note 111, at 370 ("Regarding the governance structure, the Pix rulebook can be seen as a joint construct to which stakeholders contribute actively through the Pix Forum—a permanent consultative body with more than 200 participants, the documentation of which has been transparently disclosed by the BCB.").

[175] BANCO CENTRAL DO BRASIL, CONSULTA PÚBLICA 76 OF 2020 [Public Consultation 76 of 2020], https://www3.bcb.gov.br/audpub/DetalharAudienciaPage?13 (Braz.) (giving notice and requesting comments on proposed on regulation creating Pix and setting the rules for Pix's functioning).

[176] *Pix: What is Pix?*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/financialstability/pix_en (last visited Dec. 20, 2022).

[177] *Estatísticas do Pix, Estatísticas de Chaves Pix: Chaves por Natureza—November 2021* [Pix Statistics, Pix Keys Statistics: Keys by Nature] BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/estabilidadefinanceira/estatisticaspix (measured on Nov. 30, 2021).

[178] The number does not include Pix transactions settled in the participant's books, without SPI interference. *Pix Statistics, Number of Users Transacting Pix—October 2021*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/financialstability/pixstatistics (last visited Dec. 20, 2022); *see also* Press Release, Banco Central do Brazil, Pix: 1 year facilitating payments throughout Brazil (Nov. 16, 2021), https://www.bcb.gov.br/en/pressdetail/2421/nota.

[179] *Pix Statistics: Pix Transactions—December 2022*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/financialstability/pixstatistics (last visited Jan. 21, 2023).

[180] *Digital Payments Have Gone Viral in Brazil*, THE ECONOMIST (May 14, 2022), https://www.economist.com/finance-and-economics/2022/05/14/digital-payments-have-gone-viral-in-brazil.

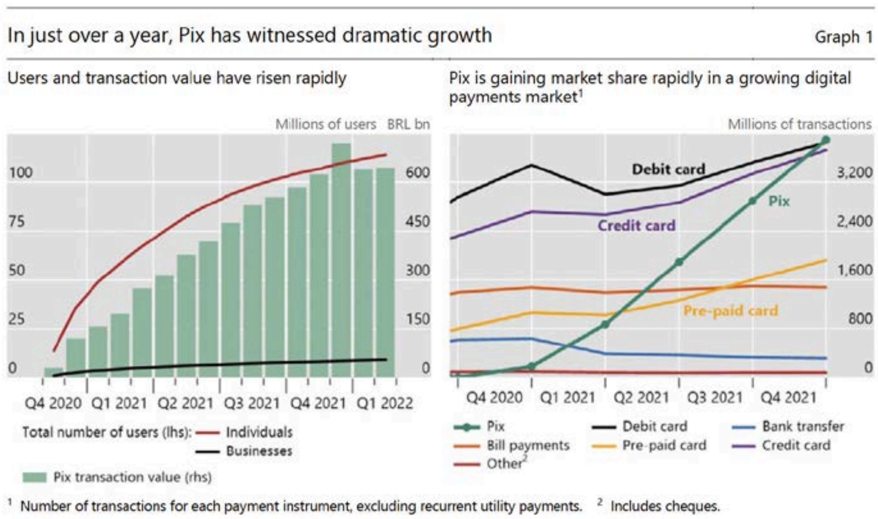

Figure 3[181]

Such a fast-paced and widespread adoption of a payment service would not have been possible were it not for the active role the BCB has played in developing and operating all parts of Brazil's instant payments ecosystem—Pix, SPI and DICT. Moreover, the fulfillment of BCB's mission as the Brazilian Payment System's regulator was equally essential for Pix's success.

First, BCB regulations determine that Pix participation is mandatory for all financial and payment institutions that hold more than 500,000 active transaction accounts.[182] This mandatory participation has guaranteed important network effects—eager to compete with the large institutions that were required to participate in Pix, other PSPs soon joined the payment scheme voluntarily.[183]

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[181] Duarte et al., *supra* note 114, at 5.

[182] Resolução BCB N° 1, de 12 de Agosto de 2020, Art. 3, Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.); ALEJANDRO D.L. CARRILLO, BANCO DE MÉXICO, CODI: LA NUEVA FORMA DE PAGAR EM MÉXICO 12 (2019), https://www.banxico.org.mx/publicaciones-y-prensa/presentaciones/%7B1CA33D18-A38C-EE29-41BF-6302A641D617%7D.pdf (A similar requirement was made by the central of Mexico in relation to its digital payment platform).

[183] Duarte et al., *supra* note 114, at 7.

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Second, Pix's widespread adoption in Brazil is due to, in great part, its low costs, which result from a BCB regulatory requirement determining that PSPs offer Pix payment services at no cost for individuals and at low cost for businesses.[184] Before Pix, small businesses and individual merchants coming from the informal economy would only receive electronic payments through bank transfers or credit cards, paying high fees that negatively impacted their profits or forced them to mark up prices.[185] With Pix, the average cost of payments for businesses is 0.22%, a number significantly lower than the average fees of 2.2% for credit cards in Brazil, 1.7% in the United States, 1.5% in Canada, and 0.3% in the European Union.[186] The BCB recovers the cost of running Pix through the fees it collects from PSPs, which consist of 0.01 Brazilian reals (approximately one-fifth of a cent in U.S. dollars) per every ten transactions.[187]

Third, Pix's interface is friendlier for retail users than other kinds of digital payment methods, a characteristic that also resulted from BCB regulations. Pix transactions do not require physical cards and point-of-sale (POS) terminals, as credit and debit card payment schemes do. Also, Pix users can make payments entering only the payee's Pix key or reading a QR code, rather than having to enter the payee's detailed information, containing name, taxpayer ID number, account number, account type, and the payee's PSP name or ID code, as required for wire transfers (TED and DOC) and bank slips' payments. Additionally, the BCB regulations established standard user interface requirements to ensure that users enjoy a uniform experience across PSPs.[188]

All these Pix features—being mandatory for regulated institutions, being free or at low cost for users, and having user-friendly interfaces—are a result of requirements set out in Pix's regulations, issued by the BCB under

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[184] *See generally* Resolução BCB N° 19, de 1 de Outubro de 2020, Diário Oficial da União [D.O.U.] de 02.10.2020 [BCB Resolution 19 of Oct. 1, 2020] (Braz.).

[185] KOREFUSION, 2020 LATAM FINTECH REPORT 40 (2020), https://img.lalr.co/cms/2020/10/09182602/KoreFusion-2020-LATAM-Fintech-Report-2.pdf (showing that most countries in Latin America have an oligopoly in merchant acquiring and payment processing, which warrants them high margins to the detriment of merchants); *see also* BANCO CENTRAL DO BRASIL, RELATÓRIO 2157/2021—DECEM/DIDEF (2021), https://www.bcb.gov.br/content/estabilidadefinanceira/Publicacoes_SPB/Relatorio_Decem_2157_2021.pdf.

[186] Duarte et al., *supra* note 114, at 6–7.

[187] *Id.* at 5.

[188] Duarte et al., *supra* note 114, at 5. Online Appendix at 3.

its legal authority as the payment systems' and payment schemes' regulator.[189] Pix, therefore, is the result of a combination of the central bank acting as an operator in the Payments System, by creating and managing the instant payments ecosystem in Brazil, and as a regulator of the Brazilian Payment System. BCB's regulation of Pix and SPI has made the BCB's intervention as an operator in the Payment System more effective in advancing financial inclusion. BCB's intervention as a market actor in payments, in turn, has allowed the BCB to accomplish its policy objectives quickly and more successfully than it would have by using regulation alone.

III. Central Banks as Innovators in Payments

A. Financial Inclusion: Achievements, Promises and Limitations

Financial inclusion is the ability of an individual or business to make better use of their financial resources.[190] Access to payment services is an essential component of financial inclusion.[191] Moreover, in the digital era, those who own a checking, savings or payment account (collectively called a "transaction account") are able to make and receive payments more

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[189] *See* Lei N° 4,595, de 31 de Dezembro de 1964, Diário Oficial da União [D.O.U.] de 31.12.1964; Lei N° 10,214, de 27 de Março de 2001, Diário Oficial da União [D.O.U.] de 28.03.2001; Lei N° 12,865, de 9 de Outubro de 2013, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 4,595 of Dec. 31, 1964; Law 10,214 of Mar. 7, 2001; Law 12,865 of Oct. 9, 2013] (Braz.).

[190] *See Financial Inclusion: Overview*, THE WORLD BANK, https://www.worldbank.org/en/topic/financialinclusion/overview (last updated Mar. 29, 2022) ("Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs—transactions, payments, savings, credit and insurance—delivered in a responsible and sustainable way."). For a critique of the current definitions for financial inclusion, see Adrienne A. Harris & Emma Macfarlane, *Redefining Financial Inclusion*, 18 MICH. J. PUB. AFF. 8 (2021) (arguing for a broad definition of financial inclusion, which encompasses access to non-traditional sources of financial services and effective use of these services). *See also* MEHRSA BARADARAN, RETHINKING FINANCIAL INCLUSION: DESIGNING AN EQUITABLE FINANCIAL SYSTEM WITH PUBLIC POLICY, ROOSEVELT INST. (2020), https://rooseveltinstitute.org/wp-content/uploads/2020/07/RI_FinancialInclusion_Working-Paper_202003.pdf (admitting that the term "financial inclusion" is "nebulous, broad, and relatively uncontroversial," and positing that financial inclusion's goal is to increase, expand, or otherwise make credit, services, or transactions more available).

[191] *See* THE WORLD BANK, GLOBAL FINANCIAL DEVELOPMENT REPORT 2014: FINANCIAL INCLUSION 3 (2014), https://openknowledge.worldbank.org/handle/10986/16238 (citing empirical evidence showing that financial inclusion in basic payments helps to reduce poverty).

efficiently than they would using only cash.[192] In 2021, 76% of adults globally had an account at a "regulated institution" or a "mobile money service provider."[193] The G20 Global Partnership for Financial Inclusion (GPFI), in its 2020 financial action plan, set digital financial inclusion as a priority topic and an action area for the work of the GPFI.[194] For the GPFI, digital financial inclusion is "the use of digital financial services to advance financial inclusion."[195]

Individuals and businesses are called "unbanked" when they do not have a transaction account in a regulated institution such as a financial institution or a payment institution.[196] The unbanked may lack access to a transaction account due to costs, geographical barriers, financial or digital literacy deficiencies, or bureaucratic hurdles. Alternatively, people may elect not to open a transaction account because they do not want to pay fees considered too high, do not trust financial and payment institutions, or simply do not have enough money to keep in the account. In the United States, 5.4% of households (approximately 7.1 million households) did not have a checking or savings account at a federally insured depository institution in 2019, with higher rates for racial minorities.[197]

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[192] *See* CTR. FOR LATIN AM. MONETARY STUD. (CEMLA), THE ROLE OF PAYMENT SYSTEMS AND SERVICES IN FINANCIAL INCLUSION: LATIN AMERICAN AND CARIBBEAN PERSPECTIVE 7 (2016), https://www.cemla.org/PDF/forodepagos-TheRolePaymentSystems.pdf (highlighting the importance of well-functioning electronic retail payment systems and services for financial inclusion, as "individuals and firms interact in the economy via the payments they make to each other through different instruments and channels").

[193] ASLI DEMIRGUÇ-KUNT ET AL., THE WORLD BANK, THE GLOBAL FINDEX DATABASE 2021: FINANCIAL INCLUSION, DIGITAL PAYMENTS, AND RESILIENCE IN THE AGE OF COVID-19, at 2 (2022), https://www.worldbank.org/en/publication/globalfindex.

[194] GLOB. P'SHIP OR FIN. INCLUSION (GPFI), G20 2020 FINANCIAL INCLUSION ACTION PLAN 18 (2020), https://www.gpfi.org/sites/gpfi/files/sites/default/files/G20%202020%20Financial%20Inclusion%20Action%20Plan.pdf.

[195] *Id.* at 12.

[196] There is not a uniform definition for "unbanked." The Federal Deposit Insurance Corporation (FDIC) in the United States, for example, defines unbanked as "households who do not have a checking or savings account at a bank or credit union." FED. DEPOSIT INS. CORP. (FDIC), HOW AMERICA BANKS: HOUSEHOLD USE OF BANKING AND FINANCIAL SERVICES 1 (2019), https://www.fdic.gov/analysis/household-survey/2019execsum.pdf [hereinafter FDIC]. The World Bank, however, adopts a narrower definition: "unbanked" are those adults who do not have an account at a "regulated institution, such as a bank, a credit union, microfinance institution, post office, or mobile money service provider." *See also* DEMIRGUÇ-KUNT ET AL., *supra* note 193, at 9, 15, 33.

[197] FDIC, *supra* note 196, at 1–3 (considering that a "banked household" means that at least one member of the household has a checking or savings account).

The World Bank and the BIS argue that individuals and business should have at least one transaction account operated by a regulated institution to make payments, store value, and use other financial services.[198] Being banked is indeed an indicator of financial inclusion, yet a couple of caveats apply.

For one, someone who owns a transaction account can still be "underbanked" and excluded from the best services the financial system can offer.[199] The "underbanked" are those who have access to a transaction account but, similarly to the unbanked, frequently resort to alternative financial products or services, such as payday loans, check cashing, money orders, auto title loans, pawn shop loans, refund anticipation loans, rent-to-own services, earned wage access programs, prepaid debit cards, and mobile phone payments.[200] These payment services outside the financial mainstream can be expensive, inefficient or unregulated.[201]

For two, someone without a transaction account (i.e., "unbanked") can find a gateway to adequate financial services outside the regulated industry.[202] Mobile phone payment services for people who do not have a transaction account but do have a cell phone (not necessarily a smartphone)

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[198] *See* BANK FOR INT'L SETTLEMENTS COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES and THE WORLD BANK, PAYMENT ASPECTS OF FINANCIAL INCLUSION 5 (2016), https://www.bis.org/cpmi/publ/d144.pdf. *See also UFA2020 Overview: Universal Financial Access by 2020*, THE WORLD BANK (Oct. 1, 2018), https://www.worldbank.org/en/topic/financialinclusion/brief/achieving-universal-financial-access-by-2020 (stating the World Bank Group's commitment to enable 1 billion people to gain access to a transaction account by 2020).

[199] *See* Harris & Macfarlane, *supra* note 190, at 9 ("The [financial inclusion] definition is overinclusive because even if a citizen has access to formal financial services, it does not necessarily follow that they can use these services to meet their financial needs.").

[200] Martha P. Beard, *In Depth: Reaching the Unbanked and Underbanked*, CENT. BANKER (Fed. Rsrv. Bank of St. Louis), Jan. 1, 2010, at 8; Morgan Ricks, *Money as Infrastructure*, 2018 COLUM. BUS. L. REV. 757, 828–30 (2018); THE CLEARING HOUSE ET AL., DELIVERING FINANCIAL PRODUCTS AND SERVICES TO THE UNBANKED AND UNDERBANKED IN THE UNITED STATES—CHALLENGES AND OPPORTUNITIES 9 (2021), https://www.theclearinghouse.org/-/media/new/tch/documents/advocacy/tch_unbanked_report_may_2021.pdf (pointing out that "alternative," in relation to financial products and services, generally means "outside the banking system," although the FDIC and the Board use slightly different definitions).

[201] *See generally* Michael S. Barr, *Banking the Poor*, 21 YALE J. ON REG. 121 (2004).

[202] *See* Harris & Macfarlane, *supra* note 190, at 8 ("If financial needs are met via financial technology (fintech) apps and non-predatory alternative lenders, the absence of a bank account may not indicate exclusion from the financial system.").

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are a typical example, as demonstrated Kenya's M-Pesa.[203] Mobile phones have improved low-income individuals' access to payments, reaching the underbanked and the unbanked.[204] They have provided people in low-income countries with a degree of access to financial services not enjoyed before, enabling payments, savings, microcredit, and transfers of government benefits and humanitarian assistance, without the need for intermediation by a financial or payment institution.[205]

Payment schemes can help promote financial inclusion even if some models (closed loop) are more efficient than others (open loop) in doing so. Pix, for example, is an open-loop or overlay system: it provides front-end services, but its end users need to hold a checking, savings, or payment account at a regulated financial or payment institution to make or receive payments.[206] Open-loop systems enable transactions even if payer and payee have accounts at different institutions; in this case, final settlement occurs between these institutions or their settlement agents, at the central bank.[207] Other examples of open-loop systems are VisaDirect, MasterCard Send, the

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[203] *See* SIMON K. ANDERSSON-MANJANG & NIKA NAGHAVI, GSMA, GSMA STATE OF THE INDUSTRY REPORT ON MOBILE MONEY 4 (2021), https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2021/03/GSMA_State-of-the-Industry-Report-on-Mobile-Money-2021_Full-report.pdf (reporting that, in 2020, the number of registered mobile money accounts grew by 12.7% globally to 1.21 billion accounts).

[204] *See* DOUGLAS W. ARNER ET AL., ALL. FOR FIN. INCLUSION, FINTECH FOR FINANCIAL INCLUSION: A FRAMEWORK FOR DIGITAL FINANCIAL TRANSFORMATION 5 (Sept. 2018), https://www.afi-global.org/wp-content/uploads/publications/2018-09/AFI_FinTech_Special%20Report_AW_digital.pdf ("Mobile money has played a major role in advancing financial inclusion, and the mobile phone is arguably the most powerful instrument of development in history."); *see also* HOWELL E. JACKSON & MARGARET E. TAHYAR, FINTECH LAW: THE CASE STUDIES 188 (2020) (noting that, in developing countries, 63% of people have access to a bank account, but 78% own a mobile phone).

[205] *See* Tillman Bruett, *The Latest Frontiers for Financial Inclusion: Using Mobile Phones to Reach the Unbanked*, CMTY. DEV. INV. REV., Mar. 2011, at 114, 117 (Fed. Rsrv. Bank of S.F.) (affirming that mobile money is the most promising solution to financial exclusion to date). *See also* Bruno L. Yawe, *The Evolution of Merchant Payments and Mobile Payments to Enable Financial Inclusion*, 12 J. OF PAYMENTS STRATEGY & SYS. 314, 314–15 (2018).

[206] The National Bank of Cambodia, in contrast, has launched the Bakong payment system, a retail payment system that does not rely on users having bank accounts for the transfer of funds. *See* Taimur Baig, *Outlook 2021: Digital Dynamism Will Fuel Asia's Outperformance*, OFF. MONETARY AND FIN. INST. F. (Dec. 21, 2020), https://www.omfif.org/2020/12/outlook-2021-digital-dynamism-will-fuel-asias-outperformance/.

[207] THE FED. RSRV., *Fast, Faster, Instant Payments: What's in a Name?*, https://www.frbservices.org/financial-services/fednow/instant-payments-education/whats-in-a-name.html (last visited Dec. 22, 2022).

RTP network, Zelle, ApplePay, Google Pay, SamsungPay, and India's Unified Payments Interface (UPI).[208]

Closed-loop systems, such as M-Pesa, Alipay, WeChat pay,[209] PayPal, Venmo and Square's Cash App, in contrast, process, clear and settle payments on the level of the accounts end users maintain with the single central provider within the system.[210] The funds in the transactions that occur in a closed-loop system come from these accounts, which can be preloaded by the end users. Therefore, in principle, end users do not need to own a transaction account at a regulated financial or payment institution to make and receive payments inside a closed-loop system, although their accounts in this system may be linked to an account at a regulated financial or payment institution, which will be used for the pass-through, upload or download of funds. However, transactions within a closed-loop system can only happen if both payer and payee keep an account with the same single central provider, in the same system.[211]

In M-Pesa, for example, the end user owns a pre-paid mobile phone account that holds electronic money, so-called the M-Pesa account.[212] Payments circulate from one M-Pesa account to the other, without the intermediation of a financial or payment institution.[213] Customers can deposit cash in the M-Pesa account through an agent of the mobile network operators that manage M-Pesa (Safaricom and Vodafone), usually an airtime reseller

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[208] BANK FOR INT'L SETTLEMENTS, ANNUAL ECONOMIC REPORT 2020, at 71 (June 2020), https://www.bis.org/publ/arpdf/ar2020e3.pdf (explaining that overlay systems "provide front-end services by using existing infrastructure to process and settle payments").

[209] Alipay and WeChat Pay rely on digital wallets in smartphone devices, associated with QR codes, instead of the Point-Of-Sale (POS) terminals used by card-based networks. *See generally* AARON KLEIN, BROOKINGS INST., CHINA'S DIGITAL PAYMENTS REVOLUTION (2020), https://www.brookings.edu/wp-content/uploads/2020/04/FP_20200427_china_digital_payments_klein.pdf.

[210] BANK FOR INT'L SETTLEMENTS, *supra* note 208. *See also* BANK FOR INT'L SETTLEMENTS COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES, CROSS-BORDER RETAIL PAYMENTS 29 (Feb. 2018), https://www.bis.org/cpmi/publ/d173.pdf (stating that closed-loop systems rely "on both payer and payee opening an account in or otherwise using the same closed-loop system, and can therefore offer services to both and control the end-to-end payment").

[211] THE FED. RSRV., *supra* note 207.

[212] *See* Michael S. Barr et al., *Building the Payment System of the Future: How Central Banks Can Improve Payments to Enhance Financial Inclusion* 26 (U. Mich. Ctr. on Fin., L. & Pol'y, Working Paper #3, 2020), https://financelawpolicy.umich.edu/sites/cflp/files/2021-07/cbotf-paper-3-future-payment-systems.pdf (stating that, in 2019, China's central bank ordered Alipay and WeChat Pay's operators to back the digital wallet account balances with deposit balance in banks).

[213] *Id.* at 27.

or a retail outlet.[214] The M-Pesa agents are part of a cash-in and cash-out network that allows users to convert physical cash into electronic money, and vice-versa.[215] Alternatively, users can transfer money from their transaction account to the M-Pesa account.[216]

A possible shortcoming of closed-loop systems is that they tend to escape financial regulation and leave consumers unprotected from crashes. In open-loop systems, transfer of funds are made between accounts kept with a regulated financial or payment institution, which reduces end-users' exposure to risk. Traditional bank deposits are usually guaranteed to a certain extent by deposit insurance schemes. Furthermore, to minimize risk and protect payment-account holders, regulators often require payment institutions to segregate consumers' funds from their institutional funds or to hold government bonds in an amount equivalent to the value of the deposits they hold.[217] On the other hand, end users that hold money in digital wallets with unregulated institutions, such as mobile phone accounts, can be exposed to these institutions' credit and liquidity risk.[218]

With the purpose of reducing such exposure to risk, the Central Bank of Kenya regulates M-Pesa, under the 2014 National Payment System Regulations.[219] Safaricom, the phone company, never receives or has access to customers' funds; these are paid directly to another firm, the M-Pesa Holding Company, which stores customers' funds in a trust account with the Commercial Bank of Africa.[220] The central bank monitors the trust account

[214] *Id.*
[215] *Id.*
[216] *Id.*
[217] *See generally* Part II.1. *See also* Dan Awrey & Kristin Van Zwieten, *The Shadow Payment System*, 43 J. CORP L. 775, 808–15 (2018) (describing strategies to regulate the shadow payment system, such as portfolio restrictions, private third-party insurance, outsourcing of the storage function to deposit-taking banks, and trusts).
[218] Awrey & Van Zwieten, *supra* note 217, at 804–06 (highlighting the risks of providing payment services outside the regulated banking system). *See also* Joseph Cotterill, *MTN Targets Valuation of at Least $5bn for Mobile Money Arm*, FIN. TIMES (Apr. 11, 2021), https://www.ft.com/content/901e9afe-4de1-47c3-96a8-54313d5d444d (mentioning regulators' concerns with financial services being wholly owned by mobile phone companies in Africa).
[219] *See generally* ALL. FOR FIN. INCLUSION, ENABLING MOBILE MONEY TRANSFER: THE CENTRAL BANK OF KENYA'S TREATMENT OF M-PESA (2010), https://www.afi-global.org/sites/default/files/publications/afi_casestudy_mpesa_en.pdf.
[220] *Id.* at 3.

and its management by the holding company.[221] This model ring-fences customers funds, preventing their distribution to Safaricom's creditors in case of bankruptcy.[222] In March 2020, the Central Bank of Kenya ordered Safaricom to remove charges on small peer-to-peer payments to address the crisis caused by the COVID-19 pandemic.[223]

Closed-loop systems can directly reach the unbanked population, promoting financial inclusion regardless of access to checking, savings, or payment accounts.[224] In countries where the number of unbanked people is significant and bankarization is not an attainable goal in the short term, a closed-loop system can have greater impact in democratizing payment services than an open-loop system.[225]

Pix and other instant payment platforms that depend on users owning transaction accounts, in turn, are only available for the already banked population. But they can also play a role in favor of bankarization.[226] The convenience of an efficient instant-payments ecosystem, coupled with facilitated access to a financial or payment institution, incentivizes users to

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[221] *Id.* at 4.

[222] *See* JONATHAN GREENACRE, PATHWAYS FOR PROSPERITY COMM'N ON TECH. AND INCLUSIVE DEV., BLAVATNIK SCHOOL OF GOV'T, OXFORD UNIV., REGULATING MOBILE MONEY: A FUNCTIONAL APPROACH 11 (Sept. 2018), https://pathwayscommission.bsg.ox.ac.uk/sites/default/files/2018-10/jonathan_greenacre-mobile_money.pdf.

[223] *Kenya's Safaricom Waives Some M-Pesa Transfer Fees Amid Virus Outbreak*, REUTERS (Mar. 16, 2020, 8:17 AM), https://www.reuters.com/article/kenya-safaricom-idINL8N2B956H.

[224] *See generally* RAFAEL BOSTIC ET AL., FED. RES. BANK OF ATLANTA, SHIFTING THE FOCUS: DIGITAL PAYMENTS AND THE PATH TO FINANCIAL INCLUSION (2020), https://www.frbatlanta.org/-/media/documents/promoting-safer-payments-innovation/publications/2020/09/30/shifting-the-focus-digital-payments-and-the-path-to-financial-inclusion/Shifting-the-Focus-Digital-Payments-and-the-Path-to-Financial-Inclusion.pdf (arguing that access to digital payment vehicles that do not require traditional bank accounts increases financial inclusion for the unbanked and underbanked).

[225] BHAVIN PATEL ET AL., OFF. MONETARY AND FIN. INST. FORUM, THE FUTURE OF PAYMENTS 15 (2020), https://www.omfif.org/wp-content/uploads/2020/12/The_Future_of_Payments.pdf ("Kenya's M-Pesa, a regional and global pioneer in this area [the area of mobile payments], had signed up 41.5m subscribers by 2019, up from just 20,000 a decade earlier. In 2019 alone, there were over 50m new registered mobile accounts in sub-Saharan Africa.").

[226] *See* FERNANDO S. MEIRELLES, FUNDAÇÃO GETULIO VARGAS, PESQUISA DO USO DA TI—TECNOLOGIA DE INFORMAÇÃO NAS EMPRESAS: USO SA TI NAS EMPRESAS—PANORAMAS E INDICADORES 2.39 [Research on the use of IT—Information Technology in Companies: Use of IT in Companies—Overview and Indicators] (33d ed. 2022), https://eaesatfgv.br/sites/eaesatfgv.br/files/u68/fgvcia_pes_ti_2022_-_relatorio.pdf (concluding, based on data about the number of Pix users and the number of transactions via internet banking, that consumers have opened accounts in digital banks to be able to use Pix).

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open transaction accounts to be able to make and receive payments faster.[227] In Brazil, the bankarization process, in the form of an increase on the share of adults holding a transaction account, got started before Pix, as a result of legislative and regulatory changes that allowed payment institutions to offer payment accounts.[228] The share of account holders in Brazil increased from 56% in 2011 to 70% of the adult population in 2017.[229]

Additionally, instant payments favor the underbanked, considering that slow settlement is translated into high costs for the low-income population.[230] Many underbanked people are harmed by delays in receiving payments in their accounts, because they do not have enough financial cushion to meet emergencies or unplanned expenses or have trouble correctly assessing their exact account balance on a given day.[231] They are then more likely to reach out to alternative financial service providers that are risky and exploitative.[232] They are also more frequently charged overdraft and non-sufficient fund

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[227] *See* Bech & Hancock, *supra* note 5, at 30 (arguing that innovations in payments can provide an incentive for bankarization, provided that financial literacy and identity issues are properly addressed).

[228] *See generally* BANK FOR INT'L SETTLEMENTS COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES, NON-BANKS IN RETAIL PAYMENTS (Sept. 2014), https://www.bis.org/cpmi/publ/d118.pdf. *See also* Bruno M. Salama, *Competência Regulatória do Banco Central sob a Lei 12.865* [The Central Bank's regulatory authority under Law 12,865], *in* 7 ANOS DA LEI DOS MEIOS DE PAGAMENTO: COMO O MARCO REGULATÓRIO TEM CONTRIBUÍDO PARA A EVOLUÇÃO DO MERCADO BRASILEIRO 26–29 [Seven Years of the Means of Payment Law: How the Regulatory Framework has Contributed to the Evolution of the Brazilian Market] (Gabriel Cohen ed., 2020), at 26–29 (pointing out that Law 12,865 of 2013 granted the BCB legal authority to regulate non-financial institutions that provide payment services, allowing for diminishing the concentration in the payments market). *See also* João M. de Mello & Ricardo T.L. Mourão, *Lei n° 12.865/2013: Nascimento, Evolução e Aplicação* [Law No. 12,865/2013: Birth, Evolution and Application], *in* 7 ANOS DA LEI DOS MEIOS DE PAGAMENTO: COMO O MARCO REGULATÓRIO TEM CONTRIBUÍDO PARA A EVOLUÇÃO DO MERCADO BRASILEIRO 50 (Gabriel Cohen ed., 2020) (acknowledging that PSPs that were not financial institutions already existed when Law 12,865 of 2013 was enacted, but the risks resulting from the lack of regulation inhibited market growth in the segment).

[229] Duarte et al., *supra* note 114, at Online Appendix.

[230] COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES, *supra* note 93, at 45.

[231] *See* Asli Demirguc-Kunt et al., *Financial Inclusion and Inclusive Growth: A Review of Recent Empirical Evidence* 8 (World Bank Grp., Policy Research Working Paper 8040, 2017), http://documents1.worldbank.org/curated/en/403611493134249446/pdf/WPS8040.pdf (registering the importance of instant digital payments for low-income populations, to whom the timely arrival of money is often essential). *See generally* MEHRSA BARADARAN, HOW THE OTHER HALF BANKS: EXCLUSION, EXPLOITATION, AND THE THREAT TO DEMOCRACY (Harv. Univ. Press 2015).

[232] *See* Nakita Q. Cuttino, *The Rise of "FringeTech": Regulatory Risks in Earned-Wage Access*, 115 NW. U. L. REV. 1505 (2021) (defending federal regulation of earned-wage access programs, which have emerged to serve as safer alternatives to payday loans but risk resulting in a mere shift from traditional payday loans to "fringe Fintech," or "FringeTech").

(NSF) fees, which could be avoided if they received payments faster.[233] The high interest rates that these last-resource funding mechanisms charge often bring financial distress to the unbanked and underbanked. The ratio of overdraft and NSF fees in banks' revenues, for example, demonstrates that the practice of charging this type of fee is a substantial part of some banks' business, and hence that this practice has had a substantially negative impact on the unbanked and underbanked.[234]

The demand for digital payment services in retail transactions, in lieu of cash, has increased with the widespread adoption of e-commerce, notably after the outbreak of COVID-19.[235] When cheap and easy to use, instant payment platforms have the potential to intensify the use of digital payments and bring financial inclusion, considering that cash payments can be cumbersome or expose users to accidental loss or theft.[236] In about one year after Pix's launching, 50.6 million people in Brazil who had not made any wire transfers via TED in the twelve months that preceded Pix's launching

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[233] Financial institutions may charge an overdraft fee when they cover the amount of a debit transaction that exceeds a deposit account balance; they may charge a Non-Sufficient Fund (NSF) fee when they return certain types of transactions unpaid because of insufficient balance in the deposit account. *See* ÉVA NAGUPÁL, CONSUMER FIN. PROT. BUREAU, DATA POINT: OVERDRAFT/NSF FEE RELIANCE SINCE 2015—EVIDENCE FROM BANK CALL REPORTS 2 (2021), https://files.consumerfinance.gov/f/documents/cfpb_overdraft-call_report_2021-12.pdf.

[234] *See generally* BROOKINGS INST., OPINION LETTER ON POTENTIAL FEDERAL RESERVE ACTIONS TO SUPPORT INTERBANK SETTLEMENT OF FASTER PAYMENTS (2018), https://www.federalreserve.gov/SECRS/2018/December/20181221/OP-1625/OP-1625_121418_133277_428769914666_1.pdf. *See also* CTR. FOR RESPONSIBLE LENDING, BANKS MUST STOP GOUGING CONSUMERS DURING THE COVID-19 CRISIS (2020), https://www.responsiblelending.org/sites/default/files/nodes/files/research-publication/crl-overdraft-covid19-jun2019.pdf; Michael J. Hsu, Acting Comptroller of the Currency, Remarks Before the Consumer Federation of America's 34th Annual Financial Services Committee (Dec. 8, 2021); NAGUPÁL, *supra* note 233.

[235] *See* THE FED. RSRV., FEDPAYMENTS IMPROVEMENT, MARKET READINESS BRIEF: BUSINESSES LOOK TO THE FUTURE WITH FASTER PAYMENTS, https://fedpaymentsimprovement.org/wp-content/uploads/pandemic-spurs-faster-payments-demand.pdf (last visited Jan. 3, 2023); THE FED. RSRV., FEDPAYMENTS IMPROVEMENT, FEDERAL RESERVE MARKET READINESS BRIEF: TODAY'S ON-DEMAND LIFESTYLE IS SPURRING GREATER DEMAND FOR FASTER PAYMENTS, https://qa.fedpaymentsimprovement.org/wp-content/uploads/Federal-Reserve-Consumer-Research-5_16_2022.pdf (last visited Jan. 3, 2023).

[236] *See* DAVID W. PERKINS, CONG. RSCH. SERV., R45716, THE POTENTIAL DECLINE OF CASH USAGE AND RELATED IMPLICATIONS (2019); Benjamin Geva, *Cryptocurrencies and the Evolution of Banking, Money and Payments*, *in* CRYPTOASSETS LEGAL, REGULATORY AND MONETARY PERSPECTIVES (Chris Brummer ed., Oxford Univ. Press 2019). *But see Pix: Safety*, BANCO CENTRAL DO BRASIL, https://www.bcb.gov.br/en/financialstability/pix_en (last visited Jan. 3, 2022) (describing the various functionalities Pix has incorporated to face public-safety threats).

made at least one Pix transaction.[237] Moreover, Pix has allowed the emergence of new e-commerce consumers: individuals who, before Pix, could not pay digitally for their purchases because they did not have debit or credit cards.

The combination of instant payments services and mobile phone technology accelerates financial inclusion in low-income countries, especially when most people own a smartphone, as is the case in Brazil.[238] Presently, approximately 242 million mobile phones are in use in Brazil—more than one smartphone per person, considering the total population in the country.[239] The use of smartphones and tablets for financial transactions reached 70% of the total number of transactions in Brazil in the second quarter of 2021.[240] Not surprisingly, mobile phone operators have been establishing partnerships with financial and payment institutions to offer credit and payment products and services.[241]

The BCB, the Brazilian Department of Communication (*Ministério das Comunicações*), and the National Telecommunications Agency (*Agência Nacional de Telecomunicações*, or *Anatel*) are legally mandated to promote financial inclusion by stimulating the telecommunication industry to offer payment services and incentivizing payment schemes using "terminals that belong to users and access telecommunication services." Payment schemes that facilitate mobile payments and the participating payment institutions are together part of the System of Payments and Monetary Transfers through

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[237] Fernanda Guardado, Diretora de Assuntos Internacionais e de Gestão de Riscos Corporativos [Director of International Affairs and Corporate Risk Management], O Papel do Banco Central do Brasil na Economia [The Role of the Central Bank of Brazil in the Economy] (Mar. 25, 2020), https://static.poder360.com.br/2022/03/FernandaGuardado-palestraPUC-25.mar_.2022.pdf.

[238] *See* Lei N° 12,865, de 9 de Outubro de 2013, Art. 8, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013, Art. 8] (Braz.). Payment schemes that discipline mobile payments and participant payment institutions form together the System of Payments and Monetary Transfers through Mobile Devices (*Sistema de Pagamentos e Transferência de Valores Monetários por meio de Dispositivos Móveis*, or STDM), which in turn is part of the Brazilian Payment System.

[239] *See generally* FERNANDO S. MEIRELLES, FUNDAÇÃO GETÚLIO VARGAS, PANORAMA DO USO DE TI NO BRASIL—2022 [Overview of the Use of IT in Brazil] (2022), https://portal.fgv.br/en/node/26027.

[240] Press Release, Banco Central do Brasil, Uso de Instrumentos de Pagamento Cresce 11% no Segundo Trimestre de 2021 [Use of Payment Instruments Grows 11% in the Second Quarter of 2021] (Dec. 27, 2021), https://www.bcb.gov.br/detalhenoticia/597/noticia.

[241] GLOB. SYS. FOR MOBILE COMMC'NS ASS'N, THE MOBILE ECONOMY LATIN AMERICA 2020, at 8, 25 (2020), https://www.gsma.com/mobileeconomy/wp-content/uploads/2020/12/GSMA_MobileEconomy2020_LATAM_Eng.pdf.

Mobile Devices (*Sistema de Pagamentos e Transferência de Valores Monetários por meio de Dispositivos Móveis*, or *STDM*), which in turn is part of the Brazilian Payment System. Pix, as seen above, was greatly conceived around smartphones, allowing payments with QR Codes, the use of cell-phone numbers to identify Pix keys, and APIs designed to offer a user-friendly experience by employing the mobile phone as a vehicle for payments.[242]

Yet, total elimination of cash can be detrimental to the resilience of the financial system and to financial inclusion.[243] First, digital money is useless if wireless communication or electronic storage and access become unavailable as a result of a natural disaster or a cybersecurity breach, for example. Second, cash remains the preferred method of payment in certain situations for reasons that go from privacy protection to insufficient or inexistent digital literacy or internet access.[244] Most central banks are aware of the dangers a cashless society may pose and accordingly have tempered their innovative drive with policies to preserve cash.[245] This is the case with Pix, which has recently incorporated two functionalities that allow users to withdraw cash using Pix (Pix Withdrawal, or *Pix Saque*) or obtain cash as change for a payment made via Pix (Pix Change, or *Pix Troco*) directly in commercial establishments and without the need of an ATM.[246] Preservation of cash is also the preference of central banks that are considering issuing a central bank digital currency (CBDC) and researching CBDC models. Most central banks have stated that they do not intend to substitute cash with a

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[242] Lobo & Brandt, *supra* note 111, at 374–75.

[243] *See generally* BRETT SCOTT, CLOUDMONEY: CASH, CARDS, CRYPTO, AND THE WAR FOR OUR WALLETS (Harper Business 2022).

[244] PERKINS, *supra* note 236, *passim*.

[245] *Id.* at 23–24.

[246] *Pix Frequently Asked Questions: 12—Understanding Pix Withdraw and Pix Change*, BANCO CENTRAL DO BRAZIL, https://www.bcb.gov.br/en/financialstability/pixfaqen (last accessed Jan. 3, 2023); *see also* Lucas A. Freire et al., Parecer Jurídico 177/2021-BCB/PGBC (Mar. 26, 2021), Governo Federal—Acesso à Informação [Federal Government—Access to Information], Legal Department of the Central Bank of Brazil, Legal Opinion (Braz.), http://www.consultaesic.cgu.gov.br/busca/dados/Lists/Pedido/Item/displayifs.aspx?List=0c839f31%2D47d7%2D4485%2Dab65%2Dab0cee9cf8fe&ID=1630380&Source=http%3A%2F%2Fwww%2Econsultaesic%2Ecgu%2Egov%2Ebr%2Fbusca%2FSitePages%2Fresultadopesquisa%2Easpx%3Fk%3DALL%28Pix%2520Parecer%29&Web=88cc5f44%2D8cfe%2D4964%2D8ff4%2D376b5ebb3bef (legal opinion concluding that cash provision in Pix Withdraw and Pix Change is not an activity exclusive to financial institutions or payment institutions, although Pix participants remain responsible for the services associated with this activity).

retail CBDC, but instead to make both physical and digital formats of central bank money available to the people.[247]

B. Competition in the Payment System

Central banks can stimulate competition in the Payment System as a means to achieve financial inclusion goals.[248] Weakening competition harms consumers because it leads to higher prices and lower quality of products and services.[249] On the other hand, as noted above, it is not unusual for central banks to operate payment systems, and they can even create and operate payment schemes, more recently in instant payments ecosystems, giving rise to the possibility of central banks competing with private market actors in the payments industry.[250]

In Brazil, the central bank is legally required to promote competition in the payments markets.[251] By fulfilling this mandate and aligning with the BCB's innovation agenda, the *Agenda BC#* Pix fosters competition among

[247] Raphael Auer et al., *Rise of Central Bank Digital Currencies: Drivers, Approaches and Technologies*, 22, 24, 26 (Bank for Int'l Settlements, BIS Working Papers No. 880, 2020) (reporting that in the Chinese, Swedish and Canadian CBDC projects, the CBDC is not intended to fully replace cash); *see also* BANK OF CANADA ET AL., BANK FOR INT'L SETTLEMENTS, CENTRAL BANK DIGITAL CURRENCIES: FOUNDATIONAL PRINCIPLES AND CORE FEATURES (2020) (Report No. 1 in a series of collaborations from a group of central banks).

[248] BANCO CENTRAL DO BRASIL, BANKING REPORT (REB) 2020 [RELATÓRIO DE ECONOMIA BANCÁRIA 2020] 196 (2021), https://www.bcb.gov.br/publicacoes/relatorioeconomiabancaria ("A dimensão Competitividade [da Agenda BC#] tem como propósito buscar a adequada precificação por meio de instrumentos de acesso competitivo aos mercados.") ([The Competitiveness Dimension [of Agenda BC#] aims at searching for adequate pricing via instruments of competitive access to markets."]).

[249] *See* Ana G. Marín & Rainer Schwabe, *Bank Competition and Financial Inclusion: Evidence from Mexico*, 55 REV. OF INDUS. ORG. 257–58 (2018) (documenting a positive relation between bank competition and the penetration of bank accounts and concluding that policies that facilitate bank competition should have a prominent role in the financial inclusion agenda). *See also* Paulo Trevisani & Jeffrey T. Lewis, *Brazil's Central Bank Uses Payment Platform to Spur Competition*, WALL ST. J. (Mar. 26, 2021), https://www.wsj.com/articles/brazils-central-bank-uses-payment-platform-to-spur-competition-11616756401 (reporting how Pix is part of the central bank's effort to fight banking concentration and pull the unbanked into the formal financial system); THOMAS PHILIPPON, THE GREAT REVERSAL: HOW AMERICA GAVE UP ON FREE MARKETS 18–20 (Belknap Press 2019).

[250] *The new TARGET Instant Payment Settlement (TIPS) service*, EUR. CENT. BANK (June 2017), https://www.ecb.europa.eu/paym/intro/mip-online/2017/html/201706_article_tips.en.html (about the various degrees of central-bank participation in the instant payments solutions implemented around the world).

[251] Lei N° 12,865, de 9 de Outubro de 2013, Arts. 7(II), 9(X), Diário Oficial da União, [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013, Arts. 7(II), 9(X)] (Braz.).

PSPs and among the providers of ancillary technological services. Having allowed and incentivized ample participation in Pix by financial and payment institutions, the BCB regulations quickly created network effects for Pix.[252] The standardization resulting from the API Pix itself enables wide integration and interoperability, fostering competition among PSPs. With SPI, Pix, and the API Pix, the BCB also provided the market with an instant payment infrastructure upon which private innovation can flourish, in the form of a variety of newly designed APIs that connect Pix payments with other business needs, such as payrolls and programed payments.[253]

Pix's undeniable success has demonstrated the existence of market demand for retail instant payments that are efficient, convenient, secure, and cheap. Yet, despite representing in part a response to a concentrated market in the credit card industry and to the private apathy toward developing an instant payment ecosystem, Pix is currently the only payment scheme dedicated to retail instant payment services in Brazil.[254] In the context of competition, originally established government monopolies often evolve to later admit the introduction of private competitors,[255] with the state-owned actor staying in the market and competing with the newly-arrived private actors.[256] Nevertheless, it is still unclear whether Pix will face competition from private payment schemes in the instant payments ecosystem anytime soon.

The first potential hurdle for competition with Pix is related to the use of SPI. SPI, the only payment system that settles retail instant payments in the country, is operated by the BCB.[257] Although Pix welcomes all financial and payment institutions that fulfill participation requirements, current BCB

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[252] *Pix Participants*, BANCO CENTRAL DO BRASIL (2022), https://www.bcb.gov.br/en/financialstability/pixparticipants ("The criteria for participating in Pix is broad and flexible, focused on the safety and efficiency of the scheme, in order to foster competition within the ecosystem. In this sense, participation in Pix is open for all financial and payment institutions licensed by BCB that offer transaction accounts. The payment institutions not authorized by BCB can also participate in Pix under specific conditions.").

[253] *See* Resolução BCB N° 1, de 12 de Agosto de 2020, Pix Rules, Art. 15-B, Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.).

[254] *See* Part II.B, *supra*.

[255] *See* Levitin, *supra* note 44, at 15.

[256] *Id.* at 16.

[257] *Instant Payment System*, BANCO CENTRAL DO BRASIL (2022), https://www.bcb.gov.br/en/financialstability/spi_en.

regulations do not authorize other payment schemes to run on SPI, apart from Pix.[258] In theory, however, private payment schemes could use an instant payments system different from SPI connected to reserve accounts at the central bank for final settlement.

That said, establishment of public-private competition parameters would enable fair competition between Pix and entrant private payment schemes in the instant payments' market.[259] These parameters could take the form of regulations designed to maintain a level playing field between Pix and private competitors, observing principles of competitive neutrality.[260] For instance, the regulatory requirement that large financial and payment institutions adhere to Pix could equally apply to payment schemes coming from the private sector.[261] Moreover, regulations could set a uniform schedule for the fees PSPs charge from customers, applying to Pix and private payment schemes alike. In this case, central-bank limitations to customer fees should be carefully balanced to avoid chilling private offers of payment services or products while, at the same time, preserving network effects.[262] Finally, the fees the PSPs owe to the BCB relative to each Pix

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[258] *See* D'SILVA ET AL., *supra* note 99, at 17 (comparing India's UPI payment system, which can be used by any regulated payment service provider to transfer funds between individuals).

[259] *See* Robert Pitofsky et al., *The Essential Facilities Doctrine Under United States Antitrust Law*, 70 ANTITRUST L.J. 443 (2002) (explaining that a denial of access of an essential facility grants immunity from competition if the facility is controlled by a monopolist and if the competitor is unable to duplicate the essential facility, which, in antitrust law, is called the "essential facilities doctrine"). *But see* James McAndrews, *Antitrust Issues in Payment Systems: Bottlenecks, Access, and Essential Facilities*, FED. RSRV. BANK OF PHILA. BUS. REV. Sept./Oct. 1995 at 11, https://www.philadelphiafed.org/-/media/frbp/assets/economy/articles/business-review/1995/brso95jm.pdf (pointing out that compelled access to a facility "can give a free ride to those allowed to join and can inhibit those who may wish to create new facilities, thereby conferring monopoly power on the owner of the nonessential facility").

[260] *See generally* ORG. FOR ECON. COOP. AND DEV., COMPETITIVE NEUTRALITY: MAINTAINING A LEVEL PLAYING FIELD BETWEEN PUBLIC AND PRIVATE BUSINESS (2012) (highlighting "existing competitive neutrality practices and current challenges faced by policy makers committed to level the playing field between public and private business"), https://www.oecd.org/corporate/50302961.pdf.

[261] *See* Lobo & Brandt, *supra* note 111, at 373.

[262] *See generally* Duncan Miriri, *Kenya's Safaricom Expects M-Pesa Price Curbs to be Lifted at Year-end*, REUTERS (Dec. 9, 2020), https://www.reuters.com/article/health-coronavirus-kenya-safaricom/kenyas-safaricom-expects-m-pesa-price-curbs-to-be-lifted-at-year-end-idUSL8N2IO2W9 (where the central bank ordered Safaricom to remove "all charges on small peer-to-peer transfers in March to facilitate cashless payments during the COVID-19 pandemic").

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transaction[263] can be a useful mechanism to make competition viable.[264] The BCB assesses these and other fees from financial and payment institutions with the purpose of recouping the costs it incurs with payment services, including those related to SPI and DICT.[265]

Indicating a trend of welcoming private competition in payments without compromising the Payment System's stability, in 2021 the BCB licensed two new payment schemes offered by Visa and Mastercard in partnership with Facebook (now Meta), allowing users to transfer funds directly through WhatsApp, a messaging service that belongs to Meta.[266] The BCB also licensed WhatsApp to function as a payment initiator for transfers of funds through a service called WhatsApp Pay, but limited to person-to-person (P2P) transactions.[267] Person-to-business (P2B) transactions via WhatsApp Pay are still unavailable, as Visa and Mastercard await BCB's approval for the payment schemes that would allow WhatsApp Pay to offer P2B features as well.[268] Moreover, potential payment partners to WhatsApp Pay, such as merchant acquirers, apparently have not found the fee structure offered by WhatsApp attractive enough.[269]

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[263] *See supra* Part II.B.

[264] *See infra* Part III.B for the cost-recovery requirements applicable to the Fed's provision of payment services.

[265] *See* Instrução Normativa BCB N° 192, de 30 de Novembro de 2021, Diário Oficial da União [D.O.U.] de 1.12.2021 [BCB Normative Instruction 192 of Nov. 30, 2021] (Braz.).

[266] *See BC Autoriza Dois Arranjos e uma Instituição de Pagamentos Relacionados ao WhatsApp* [BC Authorizes Two Schemes and One Payment Institution Related to WhatsApp], BANCO CENTRAL DO BRASIL (Mar. 30, 2021), https://www.bcb.gov.br/detalhenoticia/17359/nota; Mariella Moon, *WhatsApp Payments get Approved by Brazil's Central Bank*, YAHOO FIN. (Mar. 31, 2021), https://finance.yahoo.com/news/whatsapp-payments-brazil-approved-093500437.html.

[267] *See also* Resolução BCB Nº 80, de 25 de Março de 2021, Arts. 3(IV), 4, Diário Oficial da União [D.O.U.] de 29.3.2021 [BCB Resolution 80 of Mar. 25, 2021] (Braz.) (Article 3(IV) states that the payment transaction initiator is a payment institution that does not hold a payment account and never holds the funds that are being transferred in the transaction it initiates; Article 4 prohibits the payment initiator from storing users' data and making any use of this data but those necessary for the provision of payment initiation services).

[268] *BC Autoriza Dois Arranjos e uma Instituição de Pagamentos Relacionados ao WhatsApp* [BC Authorizes Two Schemes and One Payment Institution Related to WhatsApp], BANCO CENTRAL DO BRASIL (Mar. 30, 2021), https://www.bcb.gov.br/detalhenoticia/17359/nota; *BC Autoriza Mudança em Regulamento de Arranjo de Pagamento de Compra da Visa* [BC Authorizes Changes in Visa Payment Scheme for Purchases], BANCO CENTRAL DO BRASIL (Nov. 18, 2022), https://www.bcb.gov.br/detalhenoticia/17771/nota.

[269] Michael Pooler & Hannah Murphy, *Meta Suffers Setback with WhatsApp Business Payments in Brazil*, FIN. TIMES (Apr. 20, 2022), https://www.ft.com/content/6d32bd6e-9278-4eba-a64c-482492520ee0.

But the road that led to WhatsApp entering the Brazilian payments market was not without its bumps. On June 15, 2020, WhatsApp announced it would provide payment services in Brazil via Visa and Mastercard payment schemes, charging merchant fees of 3.99%.[270] Only eight days later, the BCB ordered the suspension of WhatsApp payment services, based on competition, privacy, and efficiency concerns.[271] The Brazilian competition authority, *Conselho Administrativo de Defesa Econômica* (*Cade*), also issued an order suspending WhatsApp's partnership with Cielo in WhatsApp Pay and the provision of WhatsApp services, through an emergency administrative decision that was soon later lifted.[272] Cielo, which is Brazil´s largest merchant acquirer, is controlled by Banco do Brasil S.A. and Banco Bradesco S.A., two big Brazilian banks.[273] BCB and Cade share the legal authority to examine concentration acts in the Brazilian financial system.[274] Only after WhatsApp became a regulated payment initiator subject to the

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[270] *Bringing Payments to WhatsApp for People and Small Businesses in Brazil*, WHATSAPP BLOG (June 15, 2020), https://blog.whatsapp.com/bringing-payments-to-whatsapp-for-people-and-small-businesses-in-brazil; Manish Singh & Ingrid Lunden, *WhatsApp Finally Launches Payments, Starting in Brazil*, TECHCRUNCH (June 15, 2020, 8:14 AM), https://techcrunch.com/2020/06/15/whatsapp-finally-launches-payments-starting-in-brazil.

[271] *Nova Solução de Pagamentos Depende de Prévia Autorização do BC* [New Payment Solution Depends on Prior Authorization from the BCB] BANCO CENTRAL DO BRASIL (June 23, 2020), https://www.bcb.gov.br/detalhenoticia/17108/nota.

[272] Ministério da Justiça e Segurança Pública, Conselho Administrativo de Defesa Econômica, Despacho SG No. 684/2020 [Ministry of Just. and Pub. Sec., Admin. Council for Econ. Def., Order 684/2020] (30.6.2020) (Braz.), https://sei.cade.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?DZ2uWeaYicbuRZEFhBt-n3BfPLlu9u7akQAh8mpB9yN-fGnJRJEVdkX3-qzJmBcz_FPGTM2BV2cXuaox4oACnz1UrsG95Ere24g4qG8SreDwpuvQ9As7PgxsYTE9zgeU; *see also* Carolina Mandl, *Brazil Antitrust Agency Revokes Decision Blocking WhatsApp, Cielo Venture*, REUTERS (June 30, 2020, 5:57 PM), https://www.reuters.com/article/us-facebook-brazil-cade/brazil-antitrust-agency-revokes-decision-blocking-whatsapp-cielo-venture-idUSKBN2413NG.

[273] Carolina Mandl & Isabel Versiani, *Brazil Suspends WhatsApp's New Payments System*, REUTERS (June 23, 2020, 9:04 PM), https://www.reuters.com/article/us-brazil-central-bank-visa-mastercard/brazil-suspends-whatsapps-new-payments-system-idUSKBN23V042. *See also* RICARDO F. PAIXÃO ET AL., INSTITUTO BRASILEIRO DE FINANÇAS DIGITAIS, O REGULADOR INOVADOR: BANCO CENTRAL E A AGENDA DE INCENTIVO À INOVAÇÃO 115, 171 [The Innovative Regulator: Central Bank and the Innovation Incentive Agenda] (2021) (noting that Banco do Brasil S.A., the second biggest bank in Brazil in total assets, is one of Cielo's controlling shareholders, and that WhatsApp would process payments via cards issued by Banco do Brasil S.A., Nubank, and Sicredi), https://institutopropague.org/wp-content/uploads/2021/06/Ebook-O-Regulador-Inovador-Banco-Central-e-a-agenda-de-incentivo-a-inovacao-Instituto-Propague-e-LIFT-Learning.pdf.

[274] *See* MEMORANDO DE ENTENDIMENTOS BCB/CADE OF 2018 [MEMORANDUM OF UNDERSTANDING BCB/CADE OF 2018] (Braz.) (establishing that requests involving concentration acts shall be examined by both the Central Bank of Brazil and Cade, the federal antitrust authority).

BCB regulations and supervision, and Visa and Mastercard had their P2P payment schemes that would enable WhatsApp Pay regularly approved by the BCB, the initial BCB restriction was lifted and WhatsApp began processing payments in Brazil.

Brazil is currently WhatsApp's second-largest market in the world, only behind India.[275] WhatsApp is installed in 99% of smartphones in Brazil,[276] amounting to around 120 million active users.[277] The use of WhatsApp for fast payments could be groundbreaking in Brazil, given the enormous potential of big tech to rapidly achieve network effects and big tech's capability to combine data and payments.[278] Network effects can be positive for customers if the platform translates the advantage of catering for a higher number of users into lower costs and better products and services. But these same network effects can create market dominance, reducing competition and exposing customers to the deleterious effects of monopolistic markets, not to mention the data privacy concerns associated with big tech's entry into financial services.[279]

In the United States, competition in the banking industry is often associated with fragmentation, in the sense that many financial institutions

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[275] L. Ceci, *Number of WhatsApp Users in Selected Countries Worldwide as of June 2021*, STATISTA (May 25, 2022), https://www.statista.com/statistics/289778/countries-with-the-most-facebook-users/.

[276] Latin American Business Stories, *Two Third of Brazilians Would Like to Make Payments on WhatsApp, Says Survey*, LATIN AMERICA BUSINESS STORIES (Sept. 8, 2020), https://labsnews.com/en/news/technology/two-thirds-of-brazilians-would-like-to-make-payments-on-whatsapp-says-survey/ (study was conducted by Mobile Time and Opinion Box).

[277] Carolina Mandl, *Facebook Messaging Service Gets Delayed Brazil Nod for Payments*, REUTERS (Mar. 30, 2021, 5:46 PM), https://www.reuters.com/article/us-facebook-brazil-payments/facebook-messaging-service-gets-delayed-brazil-nod-for-payments-idUSKBN2BM37H.

[278] Juan C. Crisanto & Johannes Ehrentraud, *The Big Tech Risk in Finance*, IMF (May 2021), https://www.imf.org/external/pubs/ft/fandd/2021/05/big-tech-fintech-and-financial-regulation-crisanto-ehrentraud.htm. *See also* BIS, ANNUAL ECONOMIC REPORT 2019, at 55–76 (2019).

[279] Hyun Song Shin, Econ. Adviser and Head of Rsch., BIS, Central Banks and the New World of Payments 3 (June 30, 2020) (transcript available at https://www.bis.org/speeches/sp200630b.pdf). *See also* ESWAR S. PRASAD, THE FUTURE OF MONEY: HOW THE DIGITAL REVOLUTION IS TRANSFORMING CURRENCIES AND FINANCE (2021); Rohit Chopra, *Statement Regarding the CFPB's Inquiry into Big Tech Payment Platforms*, CONSUMER FIN. PROT. BUREAU (Oct. 21, 2021), https://www.consumerfinance.gov/about-us/newsroom/statement-regarding-the-cfpbs-inquiry-into-big-tech-payment-platforms/ (about the Consumer Financial Protection Bureau (CFPB)'s orders directing Google, Apple, Facebook, Amazon, Square, and PayPal to turn over information on their payments products, as part of the Bureau's efforts to monitor the impact of Big Tech's payment platforms on market concentration and data monetization).

of different sizes and types operate in the country.[280] For decades, regulation restricting bank branching, interstate banking, and bank mergers led to fragmentation and, arguably, diminished concentration.[281] These regulatory restrictions were later reversed, but the banking industry in the United States is still less concentrated than in most parts of the world.[282]

Fragmentation in the U.S. banking system is at least in part a consequence of the country's "dual banking system." Differently to what happens in most other jurisdictions, U.S. banks and other financial institutions are regulated and supervised by a complex web of institutions organized in two layers—the federal government and the relevant state governments.[283] The U.S. dual banking system led also to the decentralized component of the Fed's governance structure, the Reserve banks.[284] And this decentralized characteristic of the Fed's governance structure influenced, in turn, the development and operation of the U.S. Payment System, where private-public competition is the norm.[285]

The Reserve banks, albeit now less powerful relative to the Board than they were at the time of the Fed's creation, are still a hybrid of public and

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[280] In 2021, there were 4,236 commercial banks with deposits insured by the FDIC. *See Number of FDIC-insured Commercial Banks in the United Sates from 2000 to 2021*, STATISTA (May 24, 2022), https://www.statista.com/statistics/184536/number-of-fdic-insured-us-commercial-bank-institutions/. *See* Dan Awrey & Joshua Macey, *The Promise and Perils of Open Finance* 31 (European Corp. Governance Inst., Working Paper No. 632/2022, 2022).

[281] See, for example, the McFadden Act of 1927, Pub. L. No. 69-639, 44 Stat. 1224 (codified as amended in scattered sections of 12 U.S.C.), the Bank Holding Company Act of 1956, 12 U.S.C. § 1841, et seq., the Bank Merger Act of 1960, Pub. L. No. 86-463, 74 Stat. 129 (1960) (current version at 12 U.S.C. § 1828).

[282] *See* Francisco Covas & Paul Calem, *Five Important Facts About the Competitiveness of the U.S. Banking Industry*, BANK POL'Y INST. (Feb. 24, 2022), https://bpi.com/five-important-facts-about-the-competitiveness-of-the-u-s-banking-industry; Diego Zuluaga, *Why There Has Been No Great Reversal in U.S. Banking*, CATO INSTITUTE (Dec. 10, 2019), https://www.cato.org/blog/why-there-has-been-no-great-reversal-us-banking. *But see* Jeremy C. Kress, *Reviving Bank Antitrust*, 72 DUKE L.J. 3, 29 (forthcoming 2022–2023) (contending that the resurgence of bank consolidation has produced historically high concentration, with five biggest commercial banks accounting for nearly 50% of U.S. banking system assets in 2020).

[283] *See* Christopher K. Odinet, *Predatory Fintech and the Politics of Banking*, 106 IOWA L. REV. 1739, 1743 (2021) (describing the "modern dual banking wars" and their impact on fintech lending regulation). *See also* JAY B. SYKES, FEDERAL PREEMPTION IN THE DUAL BANKING SYSTEM: AN OVERVIEW AND ISSUES FOR THE 116TH CONGRESS, R45726 (2019), https://crsreports.congress.gov/product/pdf/R/R45726 (on the history of the "dual banking system" and the resulting regulatory complexities for state banks and national banks).

[284] SYKES, *supra* note 283, at 6.

[285] *Id.*

private entities.[286] For example, the Reserve banks have their stock owned by the private member banks, pay dividends on stock, and have their boards partially composed by members elected by the private member banks. Moreover, the Reserve Banks maintain that the Freedom of Information Act (FOIA)[287] does not apply to them because they are not federal agencies under the statute.[288] Nevertheless, the stock private member banks hold in the Reserve banks does not award the former control and financial interest over the latter. Furthermore, the Reserve banks are not operated for profit and are subject to the Board's supervision.[289]

Turning to the payment sector, the workings of the Automated Clearing House (ACH) network, one of the two most important U.S. payment infrastructures, illustrate the amount of influence private financial institutions, especially big banks, have over the operation and regulation of the U.S. Payment System.[290] The ACH is a network that processes large volumes of lower-value payments and transfer of funds made through direct debit and credit orders, cash dispensers or ATMs, and internet-banking platforms.[291] It was developed jointly by the private sector and the Fed as an electronic network for credit and debit transfers among financial institutions.[292] The ACH network has two operators: the Reserve banks, which operate the FedACH service, and a private-sector operator, the Clearing House Payments Company L.L.C. (TCH), which operates the

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[286] *Id.*

[287] 5 U.S.C. § 552 (2018).

[288] *See* Letter from Michel Taylor Fennell, Deputy Associate Secretary of the Board, Federal Reserve System, to Michael Kaszuba, Public Record Media (Aug. 2, 2021), https://www.publicrecordmedia.org/wp-content/uploads/2021/08/FRBMPLS2021_pd_022.pdf. *But see* Kara Karlson, *Checks and Balances: Using the Freedom of Information Act to Evaluate the Federal Reserve Banks*, 60 AM. U. L. REV. 214, 233 (arguing that the Federal Reserve Banks are government agencies, and therefore subject to FOIA).

[289] Section 11(j) of the FRA. 12 U.S.C. § 248(j) (2018).

[290] Bech & Hancock, *supra* note 5, at 25.

[291] Regulation GG, jointly promulgated by the Board and the Secretary of the Department of the Treasury, defines the ACH system as "a funds transfer system, primarily governed by the ACH Rules [issued by the National Automated Clearing House Association], which provides for the clearing and settlement of batched electronic entries for participating financial institutions." 12 C.F.R. § 233.2(b) (2017).

[292] *Automated Clearinghouse Services*, BD. OF GOVERNORS OF THE FED. RSRV. SYS. (last updated Sept. 28, 2020), https://www.federalreserve.gov/paymentsystems/fedach_about.htm.

Electronic Payments Network (EPN) service.[293] In 2021, more than 29 billion payments with a total volume of close to 73 trillion U.S. dollars were transmitted via the ACH network.[294] ACH transactions are processed in batches and usually settle on a net basis using the Fed's National Settlement Service (NSS), usually in one or two business days, with the possibility of same-day settlement.[295]

The ACH network is governed by the rules of the ACH operators, which generally incorporate the NACHA Operating Rules and Guidelines, adopted by the National Automated Clearing House Association (NACHA)'s members.[296] NACHA, in turn, is a not-for-profit organization whose main direct members are the largest American banks. NACHA is the entity responsible for proposing, submitting to the members' consideration, and issuing the rules that will ultimately govern the ACH network.[297] As only NACHA's members can directly influence the rulemaking process and vote on the operating rules ballots organized by NACHA, the big commercial banks have the final word on "the governance and direction of the ACH network."[298]

The Fed's participation in the ETN side of the ACH network is limited to receiving, through the Reserve banks, the batches of payments orders for final settlement, sorting them out by banks, and crediting or debiting the

[293] Modifications to the Federal Reserve Banks' National Settlement Service and Fedwire Funds Service to Support Enhancements to the Same-Day ACH Service and Corresponding Changes to the Federal Reserve Policy on Payment System Risk, 84 Fed. Reg. 71940 (proposed Dec. 20, 2019).

[294] *About Us*, NACHA, https://www.nacha.org/content/about-us (last visited Oct. 21, 2022).

[295] *National Settlement Service*, THE FED. RSRV., https://www.frbservices.org/financial-services/national-settlement-service (last visited Oct. 21, 2022) (stating that the NSS is owned and operated by the Reserve banks). *See Operating Circular 12*, THE FED. RSRV. (effective Mar. 8, 2021) (establishing the terms under which the Federal Reserve Banks provide settlement services to the entities that established an account with a Reserve bank, through the NSS).

[296] *See* Mark E. Burge, *Apple Pay, Bitcoin, and Consumers: The ABCs of Future Public Payments Law*, 67 HASTINGS L.J. 1493, 1514 (2016) (stating that Nacha's rulemaking and governance process is formally private, but that the ACH may be characterized as a public-private partnership).

[297] *History of Nacha and the ACH Network*, NACHA (Apr. 20, 2019), https://www.nacha.org/content/history-nacha-and-ach-network ("As the administrator, Nacha sets and enforces the Rules for ACH and educates people about the network. What it doesn't do is operate the physical network. That's up to the ACH Operators: The Federal Reserve and The Clearing House. They do the actual processing and routing of transactions—'moving the money,' if you will.").

[298] *What are Nacha Direct Member Benefits?*, NACHA (2022), https://www.nacha.org/content/nacha-direct-member-0 (last visited Oct. 19, 2022) (listing Nacha's members and describing their powers). *See also* Burge, *supra* note 296, at 1512–17, for an overview of the evolution of Nacha and its main characteristics.

banks' master accounts accordingly, using the NSS—all for a price, under Section 11A of the FRA.[299] Under the Board's limited legal authority to regulate the Payment System, however, it is unclear whether the Fed has the regulatory power to impose certain obligations on the portion of the ACH network that is privately operated, determining, for example, pricing, participation criteria and processing and settlement times and conditions.[300]

Given this significant presence of private payments infrastructure providers in the U.S. Payment System, it is unsurprising that the imminent arrival of FedNow has generated disagreement.[301] FedNow, the U.S. instant payments service being developed by the Fed, will compete with an already operational private instant payments platform called RTP,[302] both dedicated to retail transactions and based on RTGS.[303] According to the Board's rules, FedNow Service "means the funds-transfer system owned and operated by the Federal Reserve Banks" to support instant payments.[304] RTP, in turn, is owned and operated by TCH, the private entity who also operates ETN, at the ACH platform, and CHIPS, a large-value payment system.[305] The RTP network settles transactions in a joint account at the Federal Reserve Bank of

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[299] *See* 12 U.S.C. § 248a (2018) (pricing of services). *See also* THE FED. RSRV., *supra* note 295.

[300] *See* discussion *infra* Part I.A. *See also* Levitin, *supra* note 103, at 5 (noting that the Board's Regulation E, issued pursuant to the Electronic Fund Transfer Act, applies to ACH transactions to the extent individual consumers' rights are affected—but ACH is primarily regulated by the Nacha rules for commercial payments, and by Treasury regulations for Treasury payments).

[301] *See* Conti-Brown & Wishnick, *supra* note 44, at 402–05 (summarizing the arguments casted by FedNow's opponents). *See also Facilitating Faster Payments in the United States: Hearing Before the Subcomm. on Banking, Hous., and Urb. Affs.*, 116 Cong. 93 (2019) (statement of George Selgin, Director, Center for Monetary and Financial Alternatives, Cato Institute) (arguing that Fed's entry into the fast payments business may postpone necessary reforms in the Fed settlement system, such as the expansion of the operating hours of Fedwire and the establishment of an alternative 24/7/365 liquidity management tool).

[302] *RTP Network*, THE CLEARING HOUSE (2022), https://www.theclearinghouse.org/payment-systems/rtp (last visited Nov. 12, 2022).

[303] *Unpacking Clearing and Settlement*, THE FED. RSRV. (2022), https://www.frbservices.org/financial-services/fednow/instant-payments-education/unpacking-clearing-and-settlement.html ("In a real-time gross settlement, a payer's financial institution pays the payee's financial institution at the time and for the amount of each of its customers' individual transactions. (. . .) By contrast, in deferred net settlement, participating financial institutions settle their net obligations to one another periodically.").

[304] 12 C.F.R. § 210.40 (2022).

[305] *About Us—Owner Banks*, THE CLEARING HOUSE (2022), https://www.theclearinghouse.org/about/owner-banks (last visited Nov. 12, 2022) (stating that TCH is owned by the "world's largest commercial banks").

New York, and participating banks must prefund the joint account, so that it can meet RTP's liquidity needs.[306]

U.S. legislation establishes the contours of the public-private competition in payments, imposing conditions and limitations under which the Fed shall play its role as an operator in the Payment System.[307] The Monetary Control Act of 1980, which amended the FRA, requires the Board to adopt and publish a set of pricing principles and schedules of fees for Fed's services, applicable equally to all depository institutions.[308] Importantly, the Act also determines that:

> over the long run, fees shall be established on the basis of all direct and indirect costs actually incurred in providing the Federal Reserve services priced, including interest on items credited prior to actual collection, overhead, and an allocation of imputed costs which takes into account the taxes that would have been paid and the return on capital that would have been provided had the services been furnished by a private business firm, except that the pricing principles shall give due regard to competitive factors and the provision of an adequate level of such services nationwide.[309]

With this provision, the Act has established a cost-recovery objective to the provision of payment services by the Fed: aggregate revenues should match costs in the long run.

The pricing policy established on Section 11A of the FRA covers any service provided by the Fed, "including but not limited to payment services to effectuate the electronic transfer of funds."[310] Despite determining that the fees charged from the depository institutions must be high enough to enable private competition with the Fed in provision of payment services, Section

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[306] Margaret Tahyar et al., *FedNow: The Federal Reserve's Planned Instant Payment Service*, HARV. L. SCH. F. ON CORP. GOVERNANCE (Aug. 31, 2020). *See also* Federal Reserve Actions to Support Interbank Settlement of Faster Payments, 84 Fed. Reg. 39297 (notice made Aug. 9, 2019) (explaining that "in an arrangement using a joint account, real-time settlement occurs on an internal ledger maintained by a private-sector operator, supported by funds that are held in an account at a Reserve Bank for the joint benefit of the service's participants").

[307] *See* Anatoli Kuprianov, *The Monetary Control Act and the Role of the Federal Reserve in the Interbank Clearing Market*, 71 ECON. Q. (FED. RESERVE BANK OF RICH.) 23, 34 (July–Aug. 1985) (remarking that the Federal Reserve's involvement in the development and operation of automated clearinghouses, in the 1970s, raised concerns that a large-scale expansion of Federal Reserve service offerings could preempt private sector initiatives).

[308] 12 U.S.C. § 248a (2018).

[309] 12 U.S.C. § 248a(c)(3).

[310] 12 U.S.C. § 248a(b).

11A(b) grants the Fed wide discretion to define which payments services it will offer.[311] The statutory provision presents an open list of payment services covered by the schedule of fees, including currency and coin services, check clearing and collection services, wire transfer services, automated clearinghouse services, and payment services to effectuate the electronic transfer of funds.[312] Because it contains a non-exclusive list, Section 11A(b) of the FRA provides the Fed with legal authority to offer any kind of payment service to "effectuate the electronic transfer of funds." Therefore, Section 11A(b) reinforces the Fed's legal authority to develop, launch, and operate FedNow[313] and, arguably, even to issue a retail CBDC distributed by PSPs, much as banknotes are distributed by banks, although the Fed has indicated that it does not plan to issue the digital dollar absent "specific authorizing law."[314]

To implement the Monetary Control Act of 1980, the Board issued a set of pricing principles that seek to balance two objectives: competition and adequate level of Reserve banks' services nationwide.[315] In the principles, the Board interpreted that the statutory cost-recovery objective requires the recovery of the full cost of the services, including operating and float costs, interest on items credited prior to collection, imputed taxes, and return on

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[311] *See id.*

[312] *Id.*

[313] The Board cites to 12 U.S.C. §§ 248: (i), (j), 1, 342, 360, 464, 4001–10, and 5001–18 as legal authority to amend Regulation J to govern funds transfers through the new FedNow Service. Collection of Checks and Other Items by Federal Reserve Banks and Funds Transfers Through Fedwire, § IV, 87 Fed. Reg. 34350 (2022) (codified as amended at 12 C.F.R. § 210).

[314] BD. OF GOVERNORS OF THE FED. RSRV. SYS., MONEY AND PAYMENTS: THE U.S. DOLLAR IN THE AGE OF DIGITAL TRANSFORMATION 3 (Jan. 2022), https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf. There is not a uniform definition for "central bank digital currency (CBDC)." For the purposes of this Article, a CBDC is a central bank liability issued in digital form and distributed to the general public—in other words, a CBDC is a digital equivalent of cash. The focus here, therefore, is on what has been called "retail CBDC." "Wholesale CBDC," as defined in the literature, is not a novel concept, as central banks already provide digital money to financial institutions in the form of bank reserves. *See* COMM. ON PAYMENTS AND MKT. INFRASTRUCTURES & MKT. COMM., CENTRAL BANK DIGITAL CURRENCIES 3–4 (Bank for Int'l Settlements 2006), https://www.bis.org/cpmi/publ/d174.pdf; PRASAD, *supra* note 279, at 195 (maintaining that a wholesale CBDC does not fundamentally change the nature of the asset, representing essentially a technological improvement in the deployment of central bank reserves used by banks for payment clearing and settlement).

[315] BD. OF GOVERNORS OF THE FED. RSRV. SYS., *Federal Reserve's Key Policies for the Provision of Financial Services*, Policies, Principles for the Pricing of Federal Reserve Bank Services (Nov. 20, 2008).

capital, incorporating then a "private-sector markup."[316] However, the Fed's general policy regarding its role in the Payment System clarifies that public interest reasons recommending that the Fed continues to provide a certain service may trump the cost-recovery objective in the short term.[317]

Also according to the Fed's general policy regarding new services and service enhancements, the Fed will provide payment services that yield a "clear public benefit" and that cannot be offered "with reasonable effectiveness, scope, and equity" by other providers alone.[318] Additionally, before making an operational or legal change regarding the Payment System, the Board will conduct a competitive impact analysis to find if the change can produce "a direct and material adverse effect on the ability of other service providers to compete effectively" with the Fed.[319] The Board has conducted a competitive impact analysis considering the amendments to the rules that are necessary to create and operate the FedNow Service, after which it concluded that FedNow would not affect "the competitive position of private-sector providers vis-à-vis the Reserve Banks."[320]

The pricing principles indicate that the design of the fees and service arrangements should not aim at protecting public-private competition in payments for its own sake, but as a means to enhance efficiency and stimulate longer-run improvements in the U.S. Payment System.[321] In 1981, the Board elaborated on the pricing principles when it issued guidelines for the provision of financial services, which state that the Fed will operate in the Payment System when the Fed's presence in the market contributes to economic efficiency—as a result of cost advantages—or where other public interest considerations so require.[322] Moreover, a different guideline declares

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[316] *Id.*, at Principles 3 to 5.

[317] BD. OF GOVERNORS OF THE FED. RSRV. SYS., *Federal Reserve's Key Policies for the Provision of Financial Services*, Policies, The Federal Reserve in the Payment System (Aug. 11, 2020), Issued 1984, revised 1990 and Jan. 2001.

[318] *Id.*

[319] *Id.*

[320] *Collection of Checks and Other Items by Federal Reserve Banks and Funds Transfers Through Fedwire*, 87 FR 34350, 12 C.F.R. 210, Document Number 2022-11090, Section IV, Publication Date June 6, 2022, Effective Date Oct. 1, 2022.

[321] BD. OF GOVERNORS OF THE FED. RSRV. SYS., *supra* note 317, at Pricing Principles.

[322] BD. OF GOVERNORS OF THE FED. RSRV. SYS., *Federal Reserve's Key Policies for the Provision of Financial Services*, Policies, Federal Reserve System Guidelines for the Provision of Financial Services, Guideline 1 (Nov. 20, 2008).

that the Fed "should be prepared to remove itself from the provision of those services that can be supplied more efficiently by the private sector," but provided that public interest considerations do not recommend the Fed's operational presence in the market.[323] Guideline 6 reinforces the Reserve banks' obligation of attending the Fed´s responsibility to serve the public interest.[324] Finally, indicating its role as an innovator and a catalyst of innovation in payments, the Fed declares that it will "continue to encourage innovation across the range of financial services."[325]

To avoid internal conflict of interests, the Fed issued organization and operation standards insulating the Reserve banks' responsibilities related to the provision of priced payment services from their other responsibilities.[326] The standards prohibit the personnel in charge of priced services from being responsible for monetary policy, bank supervision, or lending.[327] In addition, it restricts the exchange of information between the personnel in charge of priced payment services and the personnel in other areas of the Reserve bank, allowing the disclosure of confidential information in limited circumstances.[328]

The parameters established in the Monetary Control Act of 1980 and in the policies, standards and guidelines issued by the Fed aim to attenuate structural and legal constraints to public-private competition. Nevertheless, considering that final settlement can only occur at the central bank and that the central bank holds regulatory powers over its possible competitors, there cannot be perfect competition between a central bank and private providers in payments.[329] These characteristics are at the very core of what a central

[323] *Id.* at Guideline 2.

[324] *Id.* at Guideline 6. *See also* the Fed's standard establishing that the provision of priced services will be "fully consistent with the public role and responsibilities of the Federal Reserve." BD. OF GOVERNORS OF THE FED. RSRV. SYS., *Federal Reserve's Key Policies for the Provision of Financial Services*, Policies, Standards Related to Priced-Service Activities of the Federal Reserve Banks, Standards—Business Practices, Standard 1, Policy statement of Aug. 14, 1984; 1984 Fed. Res. Bull. 712 (Nov. 20, 2008).

[325] BD. OF GOVERNORS OF THE FED. RSRV. SYS., *supra* note 322, Guideline 5.

[326] BD. OF GOVERNORS OF THE FED. RSRV. SYS., *Federal Reserve's Key Policies for the Provision of Financial Services*, Policies, Standards Related to Priced-Service Activities of the Federal Reserve Banks, Standards—Organizations and Operations, Policy statement of Aug. 14, 1984; 1984 Fed. Res. Bull. 712 (Nov. 20, 2008).

[327] *Id.*, Standard 1.

[328] *Id.*, Standards 4 and 5.

[329] *See* Selgin, *supra* note 301.

bank is and does, so a real level playing field with respect to payment services provided by the central bank and private payment services providers would require a total revamp of the monetary and financial systems.

C. Enhancing Central Banks' Legitimacy

Reshaping the roles of public and private actors in the payment system, central bank-owned payment schemes, such as Pix, are an example of central banks innovative use of technology to achieve financial inclusion and competition goals in payments.[330] The BCB is acting as an innovative regulator: a regulator that promotes innovation and responds to the impact of new technologies on the financial system and the Payment System not only by making rules and exercising soft power over the financial industry but also by actively engaging in payments markets.[331]

The dual role of central banks, as operators and regulators, appears in many functions typically performed by central banks[332] and is not a novelty with respect to payment systems.[333] For example, check clearing and wire transfers were conceived privately in the United States, and later the Fed started providing these services in competition with private clearing houses, bilateral arrangements, and private wire transfer services.[334] In its early years, the Fed had the competitive advantage of being the only nationwide banking organization, with the Reserve banks' head offices and branches situated

[330] CPMI & WORLD BANK GROUP, *Payment Aspects of Financial Inclusion in the Fintech Era* 2 (Apr. 2020) (highlighting the importance of transaction accounts and payments for financial inclusion, considering their initial step to improve other financial services, such as savings, credit, and insurance).

[331] *See* Conti-Brown & Wishnick, *supra* note 44, at 406 (identifying promoting innovation, promoting access, and providing resilient interbank platforms as justifications for central banks' offering payment options). *See also* Egon B. Moreira, *Qual É o Futuro do Direito da Regulação no Brasil?* [What is the Future of Regulation Law in Brazil?], *in* DIREITO DA REGULAÇÃO E POLÍTICAS PÚBLICAS [REGULATION LAW AND PUBLIC POLICY] (Carlos A. Sundfeld & André Rosilho eds., 2014), https://edisciplinas.usp.br/pluginfile.php/4239755/mod_resource/content/1/moreira%2C%20egon%20bockmann%20-%20qual%20é%20o%20futuro%20do%20direito%20da% 20regulação%20no%20brasil .pdf (arguing that contemporary government regulation does not emerge exclusively from "legal rules;" government regulation can also derive from "legal action," where the regulator is an operator in the economy, exercising what the author calls "endo-regulation").

[332] Hockett & Omarova, *supra* note 6, at 122–34.

[333] Levitin, *supra* note 44, at 4.

[334] *Id.* at 8. *See also* R. Alton Gilbert, *The Advent of the Federal Reserve and the Efficiency of the Payment System: The Collection of Checks, 1915–1930*, 37 EXPLORATIONS IN ECON. HIST. 121, 129–30 (2000).

across the country.[335] At the same time, the Fed regulates check clearing and wire transfers, through rules like Regulation J and Regulation CC.[336]

Moreover, national Payment Systems require public and private coordination, which in many situations lead the central bank to act as a government-led PSP to the regulated institutions, if not directly to the public.[337] At a minimum, private PSPs need the central bank to complete the final settlement of digital payments, which in the traditional financial system can only occur with central-bank money, by crediting and debiting accounts held at the central bank. In addition, and as a result of being the bank of banks, central banks are well-situated to act as clearers, liquidity providers, and infrastructure providers, ensuring efficiency, safety and interoperability in payments.[338] On the other hand, because today's Payment Systems operate upon a two-tier structure of central banks and private financial institutions working in collaboration, the central bank counts on these financial institutions and other PSPs to bring innovation to the system and ensure that the related infrastructures and platforms meet the public's needs and expectations.

Yet, statutes are generally silent on whether the central bank is allowed to act as a market actor in payment systems.[339] To function as the creator, owner, and manager of Pix, the BCB has relied on its ample authority to

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[335] Gilbert, *supra* note 334, at 129, 131.

[336] Levitin, *supra* note 44, at 4–5 (mentioning the Fed's dual role in remittance transfers, where the Fed competes with private money transfer companies and regulates them through Regulation E).

[337] WORLD BANK GRP., GLOBAL FINANCIAL DEVELOPMENT REPORT 2014: FINANCIAL INCLUSION 88 (2014) ("On the payment side, governments can play a crucial role in retail payment systems by addressing the potential market failures arising from coordination problems. Streamlining these systems and facilitating their interoperability can improve their efficiency and affordability."). For an appreciation of the difficulties in coordinating payment innovations and achieving ubiquity in the United States, resulting from the breadth and complexity of the country's payments industry, *see generally* THE FEDERAL RESERVE BANKS, PAYMENT SYSTEM IMPROVEMENT—PUBLIC CONSULTATION PAPER (2013).

[338] BANK OF INT'L SETTLEMENTS, *III. Central Banks and Payments in the Digital Age*, *in* BIS ANNUAL ECONOMIC REPORT 2020, at 81 (2020) (pointing out that true interoperability may require public intervention and defending the role of central banks in defining the standards for interoperability, by operating the core of the infrastructure). *See also* PERRY MEHRLING, THE NEW LOMBARD STREET: HOW THE FED BECAME THE DEALER OF LAST RESORT 5–7 (2011) (for a "money view" perspective of the 2008 global financial crisis, describing the Fed's role as a dealer of last resort and focusing on the central bank's "historical mission to manage the balance between discipline and elasticity in the interbank payments system").

[339] *See* Lobo, *supra* note 154 (showing the role moral suasion played in BCB's efforts to modernize the Brazilian retail payment systems, especially prior to the advent of the statute that enabled the BCB to regulate and supervise payment schemes and institutions).

regulate the Payment System, according to the guidelines established by the National Monetary Council, which in turn have the objective of improving financial institutions and instruments to attain a more efficient payment system.[340] Although Brazilian law does not grant the BCB explicit powers to act as a payment scheme creator, owner, and manager, it clearly gives BCB the authority to regulate all aspects of Brazil's Payment System, in contrast with the Fed's regulatory authority over payment systems.[341] Moreover, Law 12,865 of 2013 entrusts the central bank with promoting financial inclusion, competition, and innovation in payments, and Complementary Law 179 of 2021 determines that fostering the efficiency of the financial system is one of the central bank's objectives.[342] The breadth of this statutory authority is the legal basis for the BCB to operate payment systems and provide payment services, including creating and managing payment schemes such as Pix.[343]

Apart from providing services to Pix participants, the BCB does exercise over Pix the authority of a typical payment-system and payment-scheme regulator. As such, the BCB requires certain financial institutions to join the payment scheme,[344] coordinates Pix participants by setting standardized procedures for payment services provision and payment processing,[345] sets limitations on Pix-related fees, and enforces Pix rules, including imposing penalties in response to violations of these rules.[346]

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[340] *See* Lei N° 4,595, de 31 de Dezembro de 1964, Diário Oficial da União [D.O.U.] de 31.12.1964; Lei N° 10,214, de 27 de Março de 2001, Diário Oficial da União [D.O.U.] de 28.03.2001; Lei N° 12,865, de 9 de Outubro de 2013, Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 4,595 of Dec. 31, 1964; Law 10,214 of Mar. 27, 2001; Law 12,865 of Oct. 9, 2013] (Braz.). *See also supra* Part I.A.

[341] *See supra* Part I.A. In the United States, however, the central bank's authority to provide payment services is explicit in the Monetary Control Act of 1980, while in Brazil this authority is implicit. *See supra* Part III.B.

[342] *See* Law 12,865 of 2013; *see also* Complementary Law N° 179, de 24 de Fevereiro de 2021, Diário Oficial da União [D.O.U.] de 25.02.2021 [Law 179 of Feb. 24, 2021] (Braz.).

[343] *See* Lucas A. Freire et al., Parecer Jurídico 482/2020-BCB/PGBC (Aug. 6, 2020), Governo Federal—Acesso à Informação [Federal Government—Access to Information], Legal Department of the Central Bank of Brazil, Legal Opinion (Braz.), http://www.consultaesic.cgu.gov.br/busca/dados/Lists/Pedido/Item/displayifs.aspx?List=0c839f31%2D47d7%2D4485%2Dab65%2Dab0cee9cf8fe&ID=1630380&Source=http%3A%2F%2Fwww%2Econsultaesic%2Ecgu%2Egov%2Ebr%2Fbusca%2FSitePages%2Fresultadopesquisa%2Easpx%3Fk%3DALL%28Pix%2520Parecer%29&Web=88cc5f44%2D8cfe%2D4964%2D8ff4%2D376b5ebb3bef.

[344] *See* Resolução BCB N° 1, de 12 de Agosto de 2020, Art. 3, Diário Oficial da União [D.O.U.] de 13.08.2020 [BCB Resolution 1 of Aug. 12, 2020] (Braz.).

[345] *See* Law 10,214 of 2001.

[346] *See* Law 12,865 of 2013.

Nevertheless, due to the central bank's ownership of Pix and management responsibilities, Pix's legal framework has components that coincide with those found in private payment schemes' frameworks, such as patent and trademark rights relative to the technology and the Pix brand name,[347] and privacy rights and personal data protection relative to the database kept inside DICT, the system that holds the Pix keys and links them to the transaction accounts.

Central banks' legitimacy to act as innovators depends on laws providing clarity to consumers and market participants on how state-owned-and-operated payment schemes and systems shall interact with private payment schemes and systems. Legislators should start by granting the central bank explicit authority to create and operate payment systems and payment schemes, where necessary to fill market gaps and in the public interest.[348] Enabling statutes should also be clear about whether, and under which conditions, the central bank must allow private payment schemes to run on the payment systems operated by the central bank.

Clear statutory rules can enhance central banks' legitimacy as innovators and provide guidance for administrative rulemaking that promotes financial inclusion, stimulates private competition, and regulates public-private competition. Statutory rules can also protect central banks and other financial regulators from having their actions deemed illegal in court, a peril that is real in jurisdictions that embrace legal theories curbing government agencies' administrative discretion. Consider theories such as the "major questions doctrine" or the "nondelegation doctrine," currently in favor with the U.S. Supreme Court.[349] Furthermore, consider the German federal

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[347] BANCO CENTRAL DO BRASIL, MANUAL DE USO DA MARCA [Brand Use Manual] (2021), https://www.bcb.gov.br/content/estabilidadefinanceira/pix/Regulamento_Pix/I_manual_uso_marca_pix .pdf (dictating how Pix participants can use the Pix brand).

[348] The identification of a market failure itself, however, is often disputable, as is the case with FedNow. *See, e.g.*, Norbert Michel, *The Federal Reserve Should Not Compete with Private Firms*, FORBES (Dec. 16, 2018), https://www.forbes.com/sites/norbertmichel/2018/12/16/the-federal-reserve-should-not-compete-with-private-firms/?sh=26c9b4457f42.

[349] *See* West Virginia v. EPA, 142 S. Ct. 2587 (2022) (finding that the Environmental Protection Agency (EPA) exceeded its statutory authority, and that Congress must provide clear direction to the agency to regulate greenhouse gas emissions); Nat'l Fed'n of Indep. Bus. v. DOL, OSHA, 142 S. Ct. 661 (2022) (ruling that the statute did not authorize the agency to require large employers to impose vaccinating or frequent testing on employees); Ala. Ass'n of Realtors v. HHS, 141 S. Ct. 2485 (2021) (deciding that the Centers for Disease Control exceeded its legal authority by imposing a moratorium on evictions to avoid the spread of the COVID-19 virus); Gundy v. United States, 139 S. Ct. 2116 (2019)

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constitutional court's 2020 verdict invoking the "proportionality principle" to rule that the ECB failed "to conduct the necessary balancing of the monetary policy objective against the economic policy effects" arising from a program for the purchase of government bonds.[350]

Allowing private and public payment service providers to coexist and compete in payments is ultimately a political decision about the optimal degree of state intervention in private markets.[351] Instead of a level playing field for public-private competition, for example, legislators could consider that instant payments are an essential service that should be offered by the government, and thus assign to the central bank the responsibility of providing services in the instant payments ecosystem without assessing fees on the PSPs, as both the payment-system operator and the payment-scheme creator and manager. At the same time, upon legal authorization, the central bank could mandate PSPs to offer their services for free, as a means to achieve network effects and financial inclusion.[352] This approach, however, would find slim legal support in a general statutory authorization for regulating the country's payment system, like the ones prevalent in existing central banks' laws. It would also conflict with other statutory provisions that empower financial and payments institutions to charge reasonable expenses incurred with fund transfers, such as Section 13(1) and Section 16(3) of the FRA.[353]

(Gorsuch, J., dissenting) (considering that the Court should abandon the "intelligible principle" test and uphold delegations from Congress to agencies only in limited circumstances). *See also* Stefania Palma & Kiran Stacey, *Supreme Court Ruling Casts Doubt on Powers of US Regulators*, FIN. TIMES (July 4, 2022), https://www.ft.com/content/6f832b0c-7a9d-4fd0-b190-d668602d520a?desktop=true&segmentId=d8d3e364-5197-20eb-17cf-2437841d178a#myft:notification:instant-email:content.

[350] BVerfG [Federal Constitutional Court], 2 BvR 859/15, May 5, 2020, https://www.bundesverfassungsgericht.de/SharedDocs/Pressemitteilungen/EN/2020/bvg20-032.html.

[351] *See, e.g.*, JOHN WEINBERG, NETWORK EXTERNALITIES AND PUBLIC GOODS IN PAYMENT SYSTEMS (1996) (explaining why the network and public-good features of payment-system markets could create an essential role for the Fed in providing services but defending that market institutions and market behavior can adapt to a form that yields efficient outcomes). *See also* LEVITIN, *supra* note 44, at 18 (arguing that Congress has delegated to the Fed the decision on whether public-private competition is appropriate in the case of payments).

[352] Brazilian law provides the central bank with such specific legal authority, empowering it to regulate the fees assessed by PSPs for payment services. *See* Lei N° 12,865, de 9 de Outubro de 2013, Art. 9(XIII), Diário Oficial da União [D.O.U.] de 10.10.2013 [Law 12,865 of Oct. 9, 2013, Art. 9(XIII)] (Braz.).

[353] 12 U.S.C. §§ 342, 360 (2018).

Moreover, a legal mandate for central banks to intervene in Payment Systems as innovative regulators can go beyond instant payment services to allow the central bank to be more proactive in other areas of money and payments in favor of financial inclusion. The possibility of central banks issuing a CBDC, for instance, is part of the discussion on how central banks can themselves use technology to better perform their duties and serve the public interest.[354] The ability to have a CBDC account at the central bank, defended in the boldest CBDC proposals, could enable the unbanked to have direct access to instant payment systems and payment schemes owned and operated by the central bank, without intermediaries.[355] Other CBDC design models consider an offline version of the digital money issued by the central bank with the objective of reaching those without internet access or transaction accounts.[356]

In the United States, for example, the so-called FedAccount proposal, brought forward by legal scholars John Crawford, Lev Menand and Morgan Ricks, envisions the Fed directly providing deposit accounts to citizens, residents and non-financial businesses.[357] FedAccounts' advocates emphasize the model's potential to advance financial inclusion by allowing the unbanked to hold their money in digital wallets operated by the Fed, the

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[354] "Making digital payments infrastructure publicly available through a CBDC would offer a cost-efficient alternative and, by increasing competition in the retail payments market, potentially reduce the price banks charge for their services." OMFIF-IBM, RETAIL CBDCS: THE NEXT PAYMENTS FRONTIER 20 (2019), https://www.omfif.org/wp-content/uploads/2019/11/Retail-CBDCs-The-next-payments-frontier.pdf.

[355] *See* Kathryn Judge, *Intermediary Influence*, 82 U. CHI. L. REV. 573, 628–30 (2015) (discussing the welfare implications of intermediation and arguing that financial intermediaries retain a great portion of the value created in a financial transaction and may create inefficiencies and fragilities in the financial system). *But see* Tom C.W. Lin, *Infinite Financial Intermediation*, 50 WAKE FOREST L. REV. 643 (2015) (explaining the strong adhesiveness of financial intermediation and claiming that many attempts at financial disintermediation create additional, new intermediaries).

[356] *See* BANK OF GHANA, DESIGN PAPER OF THE DIGITAL CEDI (ECEDI) 19 (2022), https://www.bog.gov.gh/wp-content/uploads/2022/03/eCedi-Design-Paper.pdf (proposing two types of wallets for the CBDC in Ghana: hosted wallets, which are server-based storage systems managed by financial institutions and requiring internet access, and hardware wallets, which are secured portable storage devices held by individuals and working in offline mode).

[357] John Crawford, Lev Menand & Morgan Ricks, *FedAccounts: Digital Dollars*, 89 GEO. WASH. L. REV. 113, 122 (2021). *See also* Robert Hockett, *The Democratic Digital Dollar: A Digital Savings & Payments Platform for Fully Inclusive State, Local, and National Money & Banking Systems*, 10 HARV. BUS. L. REV. ONLINE 1 (2020) (defending a "Digital Dollar Plan" to supply people with a publicly administered or overseen digital payments platform and an associated system of digital wallets or transactional accounts).

post office, or a community bank, and have free access to all services a typical commercial account offers (debit cards, ATM access, direct deposit, and online bill payment services, for example), except for credit. Under the FedAccount proposal, the Fed would not charge interchange fees for card payments or interbank transfers.[358] Once connected to the upcoming FedNow, this CBDC model would allow the implementation of a retail instant payments system that could in theory be combined with a payment scheme run by the Fed, such as Pix in Brazil, but using money issued and distributed by the central bank, instead of commercial bank money, which comes in the form of deposits in transaction accounts.[359]

Public-private monetary competition, therefore, intersects with public-private competition in payments.[360] According to surveys conducted by the BIS, payment safety and robustness is considered an important motivation for issuing a CBDC in both advanced and emerging market economies, as is payment efficiency in emerging market economies.[361] Central banks who serve as retail payment operators are uniquely positioned to undertake a CBDC project, given the abilities they have already developed when leading, coordinating, and interacting with different stakeholders.[362]

Unlike the provision of payment services such as FedNow, legislative action would probably be necessary for the creation of retail CBDC accounts held at the central bank, or for the creation of a retail CBDC held in custody by private PSPs but still a direct claim on the central bank, as proposed in

[358] Crawford, Menand & Ricks, *supra* note 357, at 139.

[359] *See Building a Stronger Financial System: Opportunities of a Central Bank Digital Currency: Hearing Before the Subcomm. on Econ. Pol'y of the S. Comm. on Banking, Hous., & Urb. Affs.*, 117th Cong. (2021) (written testimony of Lev Menand, Academic Fellow and Lecturer in Law, Columbia Law School).

[360] *See* Jess Cheng & Joseph Torregrossa, *A Lawyer's Perspective on U.S. Payment System Evolution and Money in the Digital Age*, BD. OF GOV.'S OF THE FED. RSRV. SYS.: FEDS NOTES (Feb. 4, 2022), https://doi.org/10.17016/2380-7172.2964. *See also* Stephen Cecchetti & Kim Schoenholtz, *Central bank digital currency: The battle for the soul of the financial system*, CTR. FOR ECON. & POL'Y RSCH.: VOXEU (July 8, 2021), https://voxeu.org/article/central-bank-digital-currency-battle-soul-financial-system (maintaining that cheaper, faster and more reliable retail payment systems may mute CBDC's defenders financial inclusion claims).

[361] AUER ET AL., *supra* note 58, at 9.

[362] WORLD BANK GRP., CENTRAL BANK DIGITAL CURRENCY: A PAYMENTS PERSPECTIVE 16–17 (2021), https://documents1.worldbank.org/curated/en/965451638867832702/pdf/Central-Bank-Digital-Currency-A-Payments-Perspective.pdf.

most two-tiered CBDC models.[363] One of the legal impediments new legislation would need to overcome is the prohibition on the central bank transacting with individuals and non-financial institutions.[364] In many jurisdictions, the law usually prevents central banks from transacting directly with the public and grants access to accounts at the central bank only to financial institutions, the Treasury, foreign central banks, international organizations, and government instrumentalities.[365] Accordingly, express legal authorization for the central bank to transact directly with the public would be essential in these jurisdictions.

CONCLUSION

The Brazilian Pix is an example of central-bank intervention in the Payment System where the central bank acts not only as a regulator, but also as an endogenous force overcoming market failures. Recent data on Pix's impact in the Brazilian payments market has indicated that the BCB's direct participation in instant payments services has been effective in advancing financial inclusion. The ability of Pix to serve as a catalyst for innovation in payments, stimulating competition and the development of new market solutions, is also promising.

Authorizing central banks to directly operate payment systems and payment schemes is a public policy decision related to providing central banks with additional tools to fulfill their goal of preserving monetary and financial stability. Consequently, empowering central banks in Payment Systems should be part of a well-thought project of treating payment innovation as "a force of social progress"[366] within a legal framework that situates financial inclusion as a core objective of the digital revolution.

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[363] *See* Agustín Carstens, Gen. Manager, Bank for Int'l Settlements, Digital currencies and the future of the monetary system, Remarks at the Hoover Institution Policy Seminar (Jan. 21, 2001), https://www.bis.org/speeches/sp210127.pdf. *See also FAQs: Does the Federal Reserve maintain accounts for individuals? Can individuals use such accounts to pay bills and get money?*, BD. OF GOV.'S OF THE FED. RSRV. SYS., https://www.federalreserve.gov/faqs/does-the-federal-reserve-maintain-accounts-for-individuals-can-individuals-use-such-accounts-to-pay-bills-and-get-money.htm (last updated Sept. 11, 2020) (stating that "the Federal Reserve Banks provide financial services to banks and governments entities only" and "individuals cannot, by law, have accounts at the Federal Reserve").

[364] *See supra* Part I.B.

[365] *Id.*

[366] Saule T. Omarova, *Technology v Technocracy: Fintech as a Regulatory Challenge*, 6 J. OF FIN. REG. 75, 75 (2020), https://doi.org/10.1093/jfr/fjaa004.

Central banks' proactivity in the digital revolution would democratize money and payments, ensuring that transformational technologies benefit all.

The legitimacy of central banks' protagonism in payments, however, relies on central banks being granted clear legal authority to act as innovators. Express statutory instructions for central banks to play a market-actor role in payments would help legitimize central banks' pursuit of financial inclusion objectives and provide guideposts to competition in the Payment System. Enhanced legitimacy, in turn, would assuage concerns about central banks' politicization or overreach, preserving the justification for central-bank independence.

Building on this conclusion, future research can explore other accountability mechanisms capable of enhancing the legitimacy of central banks' powers to innovate in payments and beyond. In that regard, participatory decision-making structures,[367] such as the advisory committee the BCB has created with Pix Forum, have the potential to enable dialogue between central banks, intermediaries, and end users to help decide the best way forward to deal with and use technology and innovation in favor of broader social ideals and the public at large.[368] By embedding public deliberation in central banks' decisions, participatory decision-making structures strengthen the connection between experts and citizens, which can contribute to making central banks more democratic, albeit unelected, institutions.[369]

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[367] Reeve T. Bull, *Making the Administrative State "Safe for Democracy": A Theoretical and Practical Analysis of Citizen Participation in Agency Decisionmaking*, 65 ADMIN. L. REV. 611 (2013).

[368] *But see* Alan S. Blinder et al., *Central Bank Communication with the General Public: Promise or False Hope?* (Nat'l Bureau of Econ. Rsch., Working Paper No. 30277, 2022) (discussing why and how central-bank communication with the public is more challenging than it is with expert audiences).

[369] *See* ANNELISE RILES, FINANCIAL CITIZENSHIP: EXPERTS, PUBLICS, AND THE POLITICS OF CENTRAL BANKING (2018) (defending that a dialogue with the public at large can assuage the clash of cultures between central-bank experts and publics and proposing to devise a structure that enables participatory discussions on specific policy issues). *See also* Simone Chambers, *Deliberative Democratic Theory*, 6 ANN. REV. OF POL. SCI. 307, 311 (2003) (noting that "deliberative democratic theory moves the heart of democracy away from the vote and into the public sphere and practices of accountability and justification").