Payments and the Evolution of Stablecoins and CBDCs in the Global Economy

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Executive Summary – Why Payments Matter & the Potential for Reform

The COVID-19 pandemic has transformed our lives, including how we pay for goods and services. For the first time since it began collecting the data, the Federal Reserve’s annual Payments Study recorded a sharp decline in the number of in-person, card-based payments made in 2020 – those where customers are physically present to hand their card over to the teller. This drop is remarkable because in-person card-based payments had actually increased by five billion transactions in 2018-2019, in line with historical trends.

But with lockdowns and social distancing taking effect in early 2020, customers and businesses radically shifted how they interacted with one another, moving away from in-person and toward remote payments. From 2019 to 2020, the volume of in-person payments plunged, with 11.7 billion fewer transactions recorded. In contrast, the number of “remote” payments surged by 8.7 billion – the largest one-year increase ever recorded. In 2020, the value of remote payments surpassed that of in-person payments for the very first time – reaching $3.85 trillion compared to $3.20 trillion for in-person transactions.

Yet even as the COVID-19 pandemic has promoted cashless ways of paying, these effects have not been experienced across U.S. society uniformly. Most notably, lower-income Americans and those from Black and Latinx communities continue to use cash frequently. For example, according to one 2022 survey, 30% of Americans with a household income under $30,000 reported making all or almost all of their weekly purchases in cash. 26% of Black and 21% of Latinx adults said that they did the same, compared to 12% of White adults.

In other words, payments matter and how we pay is revealing about the ways in which people engage with the economy and the financial marketplace. On the one hand, as the pandemic shows, the U.S. payments system is vibrant and adaptable. People and businesses can now access a range of digital,
user-friendly payment tools that enable them to make payments online, using personal devices like smartphones. On the other, it still falls short of achieving its potential. Many from lower income communities and communities of color lack access to affordable banking services and to a full range of payment options. This can limit their ability to participate in an increasingly digitizing economy, fostering reliance on often expensive payment choices like prepaid cards or check cashing services. Using cash can also be time-consuming and unsafe, where people must wait in line to take out money and to pay, as well as to carry around sums of money that can expose their person to physical risk. In addition, the U.S. payment system struggles to provide speed and efficiency even for those that do enjoy access to a range of payment tools. Despite the shift to digital payments, the underlying infrastructure for processing payments remains slow, unwieldy, and expensive. Sending money from one person’s bank account to another (e.g., using checks) routinely takes at least one, if not often multiple business days to finalize. During these lengthy processing periods, those entitled to money cannot use it – resulting in loss of economic value. These problems are amplified within the international payments system for U.S. dollars. Notwithstanding being home to the preeminent global reserve currency, deployed around the world to facilitate trade and finance, the United States lacks a fast, cheap, and effective cross-border payments network. Businesses and people looking to send money abroad often contend with high costs, delays and uncertainties as payments navigate the complex system of international correspondent banking.

With the U.S. payments system at an inflection point – modernizing to adapt to new technologies while also still dependent on inefficient structural settlement practices – this Report examines the potential for reform and details the opportunities and risks presented by emerging innovations. It highlights key areas for improvement within U.S. payments – financial exclusion, inefficiencies, and expense in domestic and international U.S. dollar payments architecture – and analyzes whether digital asset technologies, notably stablecoins and central bank digital currencies (CBDC) hold out the possibility for enhancing the functionality of U.S. dollar payments. As part of its analysis, it explores legislative and policy changes to enable these new payment technologies to be safely introduced into the existing U.S. payments system, enhancing its usability without compromising consumer protection and market integrity.

This Report addresses these themes across three Chapters. In its first part, it describes the basic features of the U.S. payment system and how users make transactions and receive funds. This Chapter describes how the payment system has evolved to support the U.S. economy for both individuals and businesses – and the ways in which the U.S. approach compares with (and lags behind) that of other major countries that have dedicated policy focus toward improving their payments environment. It emphasizes the following key features of the U.S. payments system:

- Payments broadly consist of two layers: (i) user-facing, where users engage with different types of instruments to make and receive payments, and (ii) bank-to-bank, where infrastructure enables money to flow between user accounts and to finally settle.
• From the users’ perspective, the United States is home to different types of payment tools, like cash, checks, cards, wire transfers, direct deposits, remittances, recurring automated clearinghouse (ACH) payments, peer-to-peer (P2P) mechanisms, and others. Digital innovations frequently enable users to make transactions more easily and conveniently. For example, card readers have become more mobile, allowing small businesses and solo entrepreneurs to accept a variety of card payments – and not just cash or checks. P2P payment tools have been widely adopted, with Cash App, Venmo, and Zelle allowing people to enjoy more flexibility when looking to send money directly to one another.

• The settlement layer in the United States depends on banks to move money between different user accounts and to settle transactions with finality. Major payments settlement infrastructure (or rails), such as the ACH system or Fedwire, is typically populated by banks and not directly accessible to non-bank players like credit card firms, money remitters, or large e-commerce sites. This means that payment services offered by non-banks must contract with a bank in order to enable payments that are conducted on non-bank networks to settle. Payment rails like the ACH network or check clearing normally require at least one business day, if not longer, for payments to finalize and settle.

• The U.S. payments system imposes a number of economic costs on its users. It remains underinclusive, with people from lower-income communities and communities of color accessing a disproportionately smaller and more expensive range of payments options owing to historic underrepresentation within the traditional banking system. Even for those with fuller access, the U.S. payments system still creates inefficiencies and costs. Domestic payment rails come with delays and expense. International U.S. dollar payment networks are also costly and slow.

• The U.S. system, therefore, represents a mix of innovation and legacy schemes. While user-facing innovations are increasingly showcasing rapid digitization and innovation, core payment rails operate on legacy bank-dominated settlement systems that often subject payments to lengthy, expensive finalization processes.

The key goal of this Chapter lies in identifying what is working well in the U.S. payments system and what features need improving to ensure that the system is at least competitive globally and capable of delivering benefits to Americans that are available to, indeed taken for granted by, people in other countries.

Chapter 2 reflects on the future – and explores the possibilities offered by emerging digital asset technologies – notably, stablecoins and CBDCs. As digitally-native tokens, stablecoins promise their holders a one-token-to-one-dollar (typically) correspondence. Generally issued on and settled rapidly using decentralized, international computer networks (blockchains), stablecoins look to
differentiate themselves from cryptocurrencies like Bitcoin by aiming to hold a stable value relative to a national currency, like the U.S. dollar, or, less commonly, other reference assets (e.g., a cryptocurrency). To maintain this stability, issuers generally commit to hold a corresponding amount of high quality liquid assets (e.g., cash/U.S. Treasuries) to be able to honor redemption requests, such that all outstanding stablecoins can be paid out quickly and reliably at par.

CBDCs, by contrast, are digitally issued liabilities owed by a country’s central bank – not by a private company. For everyday people, physical cash provides the main way by which they can hold ultra-safe central bank-issued money. Yet, as cash’s popularity wanes, central banks around the world are considering whether they ought to issue CBDCs – digitally-denominated central bank liabilities that provide a complement to physical cash.

In exploring the possibilities presented by stablecoins and CBDCs, this Report sets out some possible use cases that allow stablecoins and CBDCs to work alongside one another as part of a unified and diverse payments ecosystem. For example:

- Both technologies might be implemented in ways that could address issues of financial exclusion and under-inclusion. CBDC-based retail payment schemes can look to provide a publicly-backed, safe payments option that can be used by a population for little or no fee. CBDC accounts – even if distributed by private actors – can offer the basis for a low-frills deposit and payments service that allows people to access basic financial services. Because CBDCs are central bank-backed liabilities, they do not generally carry the risk of private-bank issued money claims. This can help them to be distributed by a range of payment service providers to reach customers that are otherwise unbanked or underbanked but who may be regularly using other kinds of payment provider (e.g., money remitters). When CBDC accounts are widely held by a country’s population, governments can consider implementing policy interventions using digital central bank money (e.g., sending stimulus payments, social security benefits, or collecting taxes).

- CBDCs that are designed to be programmable can also offer domestic policymakers a range of potential use cases. This Report explores ways in which this programmability might be harnessed to enable a variety of functions, such as rapid automated settlement between financial firms, using so-called “settlement CBDCs.” Here, CBDCs may be programmed to instantly adjust their value in an account to reflect the changing balances of settlement firms. Money would not have to flow from one firm’s account to another. Rather digitization and programmability within the currency itself could enable account balances to adjust quickly, continuously, and accurately.

- Stablecoins might also be able to improve financial inclusion. Those seeking to use stablecoins as payments tools do not always have to possess a bank account to do so. They can open a wallet on a public blockchain network and use this digital wallet address in order
to make and receive payments in stablecoins. To the extent that they might wish to take out their money, a CBDC-based conversion could offer one option - or simply changing stablecoins into physical cash could provide another.

- Stablecoin networks also offer potential uses for U.S. dollars to flow internationally. Where stablecoins are transferred between users, value can move much faster than it does presently. This can make it cheaper and faster to send money abroad, offering gains for both businesses as well as everyday people (e.g., migrant workers) that routinely transfer cash abroad and currently experience high costs and long delays when doing so.

- Domestic payments, too, could achieve enhanced efficiencies when processed using stablecoins. Business-to-business (B2B) payments, for example, might seek out faster settlement, where suppliers, customers, and funders all engage on common stablecoin networks. When combined with automated contracts and programmability, payments might be made in a “smart” way using stablecoins, where money is sent automatically upon receipt of an invoice. Fast processing would result in businesses sending payments only when needed, with rapidly-settling automated payments helping reduce late payments and fees.

Chapter 3 concludes by setting out questions and considerations for policymakers seeking to design a robust and well-regulated payments system, one primed to safely take advantage of potential utilities in innovations like CBDCs and stablecoins. A number of policy inquiries are emerging as important when seeking to oversee payments-orientated digital assets:

- Policymakers in the United States inhabit a complex regulatory ecosystem that divides authority between state and federal regulators. In the context of payments, state regulation has been dominant, with federal oversight focused on ensuring control of money laundering and illicit financing. Non-bank payment services providers generally operate under state-issued money transmission licenses that regulate key parts of their business, such as capital regulation, asset safekeeping and customer disclosures. Looking ahead to the emergence of stablecoins and CBDC-distribution, policymakers will have to determine how regulatory authority will be allocated between state and federal regulators, and whether such oversight is to be triggered based on certain kinds of activities (e.g., stablecoin issuance, wallet provision, etc.) or based on licensing entities for digital asset businesses generally.

- A further critical consideration lies in determining which kinds of firms are able to engage in stablecoin issuance and CBDC wallet distribution. One model looks to a bank-only issuance system, where stablecoin issuance/CBDC distribution is maintained within the banking system. On the other hand, non-banks might also be authorized, subject to robust oversight of their activities. In the context of stablecoins for example, federal authorities in the U.S. have in the past expressed support for banks to be the main issuers. The U.S. House of
Representatives Financial Services Committee’s proposal on stablecoin regulation, however, envisions both bank as well as non-bank issuers. Other relevant approaches, including those set by state regulators like the New York State Department of Financial Services as well as foreign regimes like that in the European Union’s Market in CryptoAssets Regulation (MiCA), permit non-banks to issue stablecoins.

- To ensure that stablecoins can be used safely and effectively, policy has to develop regulatory responses to numerous questions surrounding their operation. For example, what quality of assets qualify as sufficiently robust to ensure that stablecoins can always be redeemed quickly at par? Should stablecoin issuers be permitted to have specific master accounts at the Federal Reserve designed to hold supporting assets, including where issuers are non-bank firms? What custody rules for stablecoin reserve assets can ensure that the value in these assets is maintained for the benefit of stablecoin holders – such that when an issuer is bankrupt, reserve assets remain excluded from the bankrupt issuer’s estate (i.e., for the benefit of token holders rather than the issuer’s general creditors)?

- As other countries focus on payments-related reform, including taking steps to build regulatory frameworks for stablecoins and CBDC, what lessons can be learned from their efforts? The European Union, for example, has crafted a detailed legislative proposal, the MiCA Regulation, designed to generally oversee digital assets, including stablecoins. With the United States engaged in policy debates to develop its own approaches to digital asset and stablecoin technologies, surveying the policy decisions taken by other countries can be instructive and helpful.

With this eye toward the future, this final Chapter sets out some key policy questions important to modernize payments for an increasingly sophisticated digital payments economy. Ultimately, its analysis looks to further a core purpose of this Report: to explore ideas that can help ensure that the United States is home to an efficient, inclusive, and leading payments architecture, capable of anchoring the country’s essential economic role within the global financial and monetary system.
Chapter 1: A Primer on Payments

A. Why Payments Matter for People and the Economy

When it came time for Frank McNamara to pay the bill for a date-night dinner with his wife at the Major’s Cabin Grill eatery in New York City in 1949, he found himself in an embarrassing bind: he had forgotten his wallet at home.¹ And without cash, Frank was stuck. Vowing to find a way to avoid being left red-faced in this way again, Frank returned to the restaurant a year later with a brand new innovation in his pocket.² When the bill came, he didn’t reach for cash: instead, he handed over a cardboard card. The restaurant, prepared in advance, returned with three copies of the bill for him to sign: one for the newly-established “Diner’s Club;” the second for the restaurant; and a final copy for Frank. The Diner’s Club card, then looking to make it easier for well-to-do diners to visit participating eateries, ended up being the first-ever credit card in print. Diner’s charged a fee, plus interest, on the credit extended to customers. At the end of each month, members were expected to pay the tab for all of their purchases on the card in full.³

Frank McNamara’s forgetfulness helped transform how people make payments. Instead of paying in full and on the spot, customers could wait to pay. Rather than carrying cash with them wherever they went, they could move around Main Street with just a card in their pocket.⁴ And customers who otherwise ran lines of credit at businesses where they were known could broaden their horizons and transact within a more fluid and competitive marketplace for goods and services.⁵

As the transformative effects of Frank McNamara’s innovation make clear, payments matter. Economies and financial markets are built on the ways in which people pay, the tools they use, the technologies supporting these payments, and the ways in which the payment system is regulated. In other words, payment systems are essential to the overall experience of an economy. They create an interface through which people actively engage with it: after all, every adult must pay for things during their lives. With payments organizing the flow of money within a marketplace, their design affects

² The First Electronic Payment Systems, Medium (Mar. 28, 2020), https://medium.com/proof-of-value/the-first-electronic-payment-systems-6a9b1e108f3d (as reported, the bill was paid by Frank’s wife).
³ Matty Simmons, The First Credit Card Ever, Saturday Evening Post (Apr. 4, 2016), https://www.saturdayeveningpost.com/2016/04/day-cash-died (Mr. Simmons accompanied Frank McNamara to the lunch and later worked to promote uptake of the Diner’s Club card).
⁴ The regulatory and macroeconomic issues surrounding consumer credit card use are extensive and not the subject matter of this Report. For an overview of basic characteristics of credit cards and key terms, Federal Trade Commission, Credit, Debit and Charge Cards (Dec. 2021), https://consumer.ftc.gov/articles/0332-credit-debit-charge-cards.
B. Money and Payments: Some Basics

What Is Money Supposed to Do?

Using money to pay seems like a simple act. But to analyze how payments work and why they matter, it’s important to begin by looking at what money is and what functions it is supposed to achieve. In technical terms, economists describe money as possessing three key features. It acts as: (i) a unit of account; (ii) a medium of exchange; and (iii) a store of value.

The first attribute seems straightforward: as a “unit of account,” money offers a way to represent value. It means we can all agree on what an asset is worth and how to pay for it. Rather than haggling over what measure to use to pay for an asset and then debate how much of that measure an asset is worth, money clears the way for all actors to quickly and cheaply agree on how to display and reference value. This feature helps money become a universally understood reference point which eases the costs involved in building and navigating an economy.

The ease of coordination that money facilitates is reflected in the dominance of the U.S. dollar as a unit of account in the international trading system. Rather than repeatedly negotiating over which currencies to use when trading across borders, the global economic system has come to rely on the U.S. dollar as the main “reserve” currency of choice. The dollar is the currency most commonly held by other countries, comprising around 62% of all global foreign exchange reserves. Many critical commodities like oil are priced in U.S. dollars. Because the U.S. dollar serves as the preeminent

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**Matthias Doepke & Martin Schneider, *Money as a Unit of Account*, NBER Working Paper 19537, 1-5 (Apr. 2017) (detailing the coordination functions of currencies as units of account and noting that this can vary from the same money being used as a medium of exchange).

**Doepke & Schneider, supra note [11], 2-5.


**Siripurapu, supra note [13] (noting also that the IMF recognizes eight major reserve currencies but highlighting the dominance of the U.S. dollar).
unit of account in international trade, parties have a common measure when it comes to deciding questions of price and value. Businesses need to monitor only one country’s legal, economic, and financial system when determining the worth of the unit of account being used for their trading. And dependence on one dominant unit of account means that trading parties avoid the need to change funds into any number of different currencies to ensure payment for cross-border goods and services.\footnote{Doepke & Schneider, supra note [11], 2-5.}

Money benefits from being easily exchangeable. This means that a bill reflecting a certain unit of account must be indistinguishable from another representing the same unit of account. A $10.00 bill must be the same as all other $10.00 bills. In other words, units of account must be “fungible.” To be freely exchangeable, money must also be easy to obtain: it must possess the elasticity needed for the medium to expand (or contract) to meet the economic needs of the moment.

To consider its second attribute, money must also be widely accepted as a way to discharge economic promises.\footnote{See, e.g., Federal Reserve Bank of St. Louis, Functions of Money; The Economic Lowdown Podcast Series (Sept. 2012), https://www.stlouisfed.org/education/economic-lowdown-podcast-series/episode-9-functions-of-money.} This might happen by social convention, norms, and repeated interactions.\footnote{For example, the U.S. dollar is accepted in a number of countries even if is not, technically, legal tender within that jurisdiction. For example, Alexa Erikson, 12 Countries You Can Visit That Will Accept the US Dollar, Business Insider (May 7, 2018), https://www.businessinsider.com/countries-you-can-visit-that-will-accept-the-us-dollar-2018-5.} The legal backing of a government is the strongest spur for acceptance: because federally-backed notes and coins are declared by law to be legal tender, the law makes sure that fungible units of exchange are acceptable as money throughout the economy.\footnote{See, e.g., Federal Reserve Bank of St. Louis, supra note [16].}

Money, then, combines the capacity to represent a unit of account with the ability to be deployed as a medium of exchange. These dual qualities allow money to create “network effects.” The more widely used a currency becomes, the more it is accepted; and as more people in a given community come to rely on the currency, it becomes increasingly useful, motivating even more users to join the network.\footnote{Jess Cheng and Joseph Torregrossa, A Lawyer’s Perspective on U.S. Payment System Evolution and Money in the Digital Age, FEDS Notes, (Feb. 4, 2022), https://www.federalreserve.gov/ecohippnotes/notes/leds-notes/a-lawyers-perspective-on-us-payment-system-evolution-and-money-in-the-digital-age-20220204.html (on network effects with respect to money).}

Finally, each exchangeable unit of account must also represent a store of value. To underscore this function, money long took the form of actual commodities: each unit of account held some inherent value, often delineated by the quality and amount of gold or silver in a given coin.\footnote{See generally Christine Desan, Making Money: Coin, Currency, and the Coming of Capitalism, Oxford University Press (2015) (detailing the historical evolution from commodity money to fiat money and highlighting the important role played by law and institutions); Dan Awrey, Bad Money, 106 Cornell Law Review, 1, 10-18 (2020) (detailing the era of the free banking system).} Later, in the United States, the Federal Reserve would maintain gold and silver reserves to match the value of currency in circulation.\footnote{Cheng & Torregrossa, supra note [19].} But, over time, this notion of commodity money has given way to money being a store of value as a matter of faith, trust, convention, and law. This form of fiat (rather than
commodity) money is a formalistic store of value, not an intrinsic one. Fiat money comes with many advantages. Unlike gold or silver, the form chosen for the fiat money – paper or electronic entries in a bank account – is secure and flexible enough to circulate widely. It can also be converted easily into smaller denominations.\(^2\)

By ensuring that money can exist in paper and electronic form, policy has chosen to embrace a form of stored value that is highly mobile and able to be exchanged over long distances. This, in turn, has created space for the creation of sophisticated and adaptable payment systems that can match broader technological and financial innovations within the economy. With the proliferation of such systems and schemes, it is important to understand how reliably they represent money and enable it to be transferred from one person to another.

**How Money is Your Money?**

At its core, money represents a public promise to pay out value understood as being equal to a particular sum. How moneyish the money you hold is a question that ultimately depends on who makes you that promise. The safer the maker of the promise, the more moneyish your money is.\(^2\)

For example, is the promise being made by the state, in the form of the central bank?\(^2\) Or is it being offered by a private entity like the bank where you opened a checking account?

When you have U.S. dollars physically in hand, you are carrying paper representing a promise made by the Federal Reserve to pay you an amount equal to the face value of the bills.\(^2\) Physical cash, in other words, is a direct liability on the books of the central bank. Because dollar IOUs are fully backed by the economic power of the United States, they are, essentially, the most secure and stable form of money circulating in the world today.\(^2\) By statute, the Fed’s dollar notes are recognized as legal tender backed by the full faith and credit of the U.S. government, formally capable of satisfying money obligations within the United States.\(^2\)

In addition to issuing physical notes for circulation, the Fed also permits banks to keep their money at the Fed: that is, it serves as the bank for banks.\(^2\) Banks holding money in accounts issued by the Fed – so called “master accounts” – enjoy the assurance that their funds are held in the safest vaults.

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\(^{1}\) Federal Reserve Bank of St. Louis, *supra* note [16]. For example, fiat money avoids issues like having to manually divide precious metals in ways that exactly match a specific value.

\(^{2}\) Joseph Sommer, *Where is a Bank Account?*, 57 Maryland Law Review 1, 15-19 (1998), (acknowledging this view as traditionally accepted, but also viewing it as functionally out-of-step with the practical and social consensus around money); See also, Herman Oliphant, *The Theory of Money in the Law of Commercial*, 29 Yale Law Journal 606, 610-616 (1920) (noting the limits of dogma surrounding “currency fundamentalism”).

\(^{3}\) Cheng and Torregrossa, *supra* note [19].


\(^{6}\) But see, Sommer, *supra* note [23], 15-17 (highlighting that declaration of a currency as being legal tender does not always carry much importance either in courts, or in practice, referencing the example of Federal Reserve notes that were freely circulating and being used well before they were declared by statute as being legal tender).

\(^{7}\) Section 13(1), Federal Reserve Act 1913, 12 U.S.C. 221.

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anywhere. Funds held by the Fed on behalf of commercial banks count as liabilities on the Fed’s balance sheets – meaning that this money carries the same unshakable status as cash. The fact that the Fed acts as the guardian of bank funds signifies that master accounts also contain the most moneyish of money. Historically, only banks and some other select entities have been afforded this privilege: individuals and non-banks generally do not hold master accounts.19 Master accounts come with yet another advantage. Banks holding master accounts can have direct access to the most essential U.S. dollar payment systems. This proximity to the Fed’s infrastructure for moving money across the economy positions banks as the critical private pathway into the payments system for other businesses and for individuals that do not possess master accounts for themselves.20

The singular importance of master accounts explains the intense efforts being made by less conventional banking firms and non-banks to acquire them.21 Heated debates have arisen, for example, about whether a credit union which processes funds for marijuana businesses should hold an account.22 Applications by crypto-focused banks like Kraken and Custodia have prompted years of ongoing deliberations. In January 2023, Custodia Bank – a Wyoming-chartered bank specializing in crypto-related activities – lost in its bid to become a member of the Federal Reserve System. Its application for a master account, filed in October 2020, continues to be reviewed and litigated.23 The Fed has issued guidelines to provide greater clarity concerning decision-making for master account eligibility,24 but the fundamental situation remains unchanged: master accounts are most easily

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19 Some specialized entities, like the U.S. Treasury, and certain non-governmental organizations do also have access to master accounts. On the importance of master accounts for access to the payments infrastructure, see generally, Dan Ayrey, Unbundling Money, Banking and Payments, 110 Georgetown Law Journal 715, 716-718 (2022) (detailing the “bundling” function performed by law in enabling banks to have this unique access to the payments system); John Crawford, Lev Menand & Morgan Ricks, Fed Accounts: Digital Dollars, 89 George Washington Law Review 113 (2021) (advocating for individuals to gain access to accounts at the Fed); Saule Omarova, The People’s Ledger: How to Democratize Money and Finance the Economy, 74 Vanderbilt Law Review 1301 (2021).

20 For a detailed history and analysis of master accounts and the shifting intensity of scrutiny applied to banks applying for master accounts see generally, Julie Hill, Opening a Federal Reserve Account, Yale Journal of Regulation (forthcoming).

21 Julie Hill, supra note [30], 27-33 (noting controversies surrounding the extension of master accounts to banks without deposit insurance).

22 Fourth Corner Credit Union v. Fed. Rsrv. Bank of Kansas City, 861 F.3d 1052 (10th Cir. 2017); Hill, supra note [30], 3. The credit union was not granted an account.


24 In August 2022, the Fed finalized guidance on the principles that its regional federal reserve banks would use to determine which institutions gain access to a master account. While these criteria seek to respond to a chorus of questions on whether banks with novel kinds of charter (e.g., those specializing in digital asset business) and non-bank fintech payment services providers could qualify for a master account. Commentators note that the August guidelines remain unclear on how exactly they will apply to non-traditional banks and non-bank payment firms. For discussion, Perkins Coie, Federal Reserve Issues Final Guidelines for Master Account Access (Sept. 22, 2022), https://www.perkinsoncoie.com/en/news-insights/federal-reserve-issues-final-guidelines-for-master-account-access.html; Board of Governors of the Federal Reserve System, Guidelines for Evaluating Account and Services Requests, 87 FR 51099 (Aug. 19, 2022); Board of Governors of the Federal Reserve, Federal Reserve Board Announces Final Guidelines that Establish a Transparent, Risk-based, and Consistent Set of Factors for Reserve Banks to Use in Reviewing Requests to Access Federal Reserve Accounts and Payment Services, Press Release (Aug. 15, 2022), https://www.federalreserve.gov/newsevents/pressreleases/other20220815a.htm.

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available to traditional banks. Less conventional banks and non-banks face unclear and seemingly long odds in gaining access.\textsuperscript{35}

The moneyness of money changes when it is held at a commercial bank.\textsuperscript{36} When an individual has an account at a bank, their funds are really a dollar IOU promised to them by the bank, not by the Fed. The fact that the money claim is being issued by a commercial bank - rather than by the Fed - means that this money is less safe. A customer is exposed to the risk that the bank can fail, whereas there is obviously no comparable risk with respect to the Fed. In light of what they do (e.g., make loans), banks can be risky institutions, and some do routinely fail.\textsuperscript{37} With a contractual claim to sue the bank for the amount of money they deposit if the bank fails, each customer is a creditor against the general pool of a bank’s assets.\textsuperscript{38} This inherently higher risk means that money held by a private bank is considered to be less moneyish than physical cash or money deposited in Fed master accounts.\textsuperscript{39}

Because customers might not feel their money is completely safe in a bank, the Fed faces a policy problem to ensure that money can be used reliably within the economy. To shore up the moneyness of private bank deposits, policymakers have developed tools to protect customer savings and bolster confidence in the quality of the private dollar IOUs issued by banks.\textsuperscript{40} Perhaps the most tangible

\textsuperscript{35} The Federal Reserve Act also opens up master accounts to certain other kinds of firms, including international organizations and entities that are responsible for clearing trades. On non-banks, it is worth noting that the Reserve Trust, a non-bank fintech company, was briefly awarded a reserve account by the Kansas City Fed. However, this decision was later reversed and the Reserve Trust lost its account. On the decision to grant and then revoke access to the master account, Steven Dennis, GOP Senators Want Fed Overhaul After Reserve Trust Stonewall, Bloomberg (Jun. 29, 2022), https://www.bloomberg.com/news/articles/2022-06-29/gop-senators-want-fed-overhaul-after-reserve-trust-stonewall.

\textsuperscript{36} Cheng & Torregrossa, supra note [19]; But see, Sommer, supra note [23].

\textsuperscript{37} It is important to note that, as discussed in Chapter 3, banks engage in fractional reserve banking - where they are implicated in the process of money creation. In fractional reserve banking, banks lend out a portion of the deposits that they receive. This results in the creation of money and an expansion in the money supply. A bank receiving $100 in deposits, might keep $10 in the account, and lend out $90. This means that the borrower now has $90 in its bank account. In addition to the $100 deposit, fractional reserve banking has generated an additional $90 of money in the economy. If the depositor decides to withdraw their money, then there is a risk that the bank may not have it because of fractional reserve banking. For further discussion, see infra, Chapter 3. On bank failures generally, see, Federal Deposit Trust Corporation, Bank Failures in Brief - Summary 2001 through 2022 (Mar. 14, 2023), https://www.fdic.gov/bank/historical/bank/; According to traditional bank theory, banks are structurally vulnerable to the risk of failure. This arises, for example, owing to their funding structure that relies in part on demand deposits, that may be redeemed anytime, versus making longer-term loans that can be much less liquid. If loans falter, depositors may all try and redeem their funds en masse. The bank cannot call in its loans as quickly, leading to a run and subsequent weakening of the bank’s balance sheet as asset values fall. For the classic account, Douglas Diamond & Philip Dybvig, Bank Runs, Deposit Insurance & Liquidity, 19 Journal of Political Economy 401 (1983). For detailed discussion of a modern bank run, see the case of the United Kingdom’s Northern Rock bank, The Run on the Rock: Fifth report of session 2007-08, Vol. 1 (Jan. 24, 2008), http://www.publications.parliament.uk/pa/cm200708/cmselect/cmtrasy/56/56i.pdf; In the United States, on the March 2023 bank run at Silicon Valley Bank, for example, see Ben Foldy, Rachel Louise Ensign & Justin Baer, How Silicon Valley Turned on Silicon Valley Bank, The Wall Street Journal (March 12, 2023).

\textsuperscript{38} Cheng & Torregrossa, supra note [19].

\textsuperscript{39} Cheng & Torregrossa, supra note [19].

shield, from the customer’s standpoint, is the availability of federal deposit insurance. Should a bank fail, bank deposits up to the sum of $250,000 per account will be guaranteed by the federal government. Banks must also comply with a host of regulatory requirements to boost their capacity to make good on their promises to their depositors. These rules are extensive and complex. They are also far from perfect. And if a bank finds itself in distress, the Fed provides emergency funds that can help tide it over. In this multiplicity of ways, policy shores up the quality of money claims owed to depositors. Customers can feel more comfortable entrusting their savings to the private banking system, despite its risks, helping make bank money much more moneyish than it would be without such public support.

So that the experience of everyday money can feel uniform, reliable, and stress-free, banks are typically afforded flexibility in shifting money from customer deposits into money held on their behalf at the Fed. When customers put savings into a bank, the bank can move these funds into its master account (and so earn interest for itself). Banks can also use funds held in master accounts to pay their depositors: if customers want to withdraw their money en masse, for example, a bank can access its master account to pay out on obligations. In other words, even though central bank IOUs and private bank IOUs represent different qualities of money claims, they can be interchangeable between banks and the Fed. Broadly speaking, in this way, banks and the Fed collaborate to create a flexible, adaptable system for managing the money supply smoothly, ensuring that the technicalities of banking law and the economics of money do not disturb the experience of enjoying money as a highly secure public good within society.

C. How We Pay: A Brief Overview

Centered around banks holding Fed master accounts, the core payments infrastructure has provided a stable anchor for U.S. money flows. But, on many measures, the current payments system in the United States is also slow, expensive, underinclusive, and lacking efficiency.

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2 Cheng & Torregrossa, supra note [19]. The March 2023 bank run impacting the U.S. banking system has highlighted various shortcomings within the regulatory toolkit. For example, banks issuing mostly uninsured deposits (such as where depositors entrust more than $250,000 with their account with the bank – as was the case with Silicon Valley Bank, for example), they can make themselves especially vulnerable to a run. Bank capital and other prudential rules may also be insufficiently protective, alongside weakly implemented supervisory practices. For discussion of vulnerabilities seen in the context of the March 2023 banking crisis, see, Andrew Ackerman, Angel Au-Yeung & Hannah Miao, How Bank Oversight Failed: The Economy Changed, Regulators Didn’t, The Wall Street Journal (March 24, 2023), https://www.wsj.com/articles/how-bank-oversight-failed-the-economy-changed-regulators-didnt-ed37db6842d.
4 Committee on Payment and Settlement Systems, supra note [10], 1-4 (highlighting the interchangeability between commercial bank money and central bank money).
5 Cheng & Torregrossa, supra note [19] (describing interchangeability between central bank money and commercial bank money as the operation of two interoperable systems).
6 Sommer, supra note [23], 15-18 (highlighting the importance of the social consensus around money); Committee on Payment and Settlement Systems, supra note [10], 1-2 (noting the significance of money being built on a system of trust in order to be safe and usable).
The United States has become home to a rapidly changing and innovating payments economy.\(^7\) Payments that were unimaginable not so long ago — for online shopping, trading stocks on smartphones, splitting the rent using apps, taking cabs home without cash — are now commonplace and, for the most part, feel effortless. At the same time, as much as these innovations are being developed by a range of different kinds of entrepreneurial firms, both bank and non-banks, they ultimately rest on core payment processing systems founded on long-established, bank-centric infrastructure. This mismatch between a nimble and creative payments industry and an unchanging base processing infrastructure invites exploration of whether the U.S. payments system is working as effectively and efficiently as it can, with this analysis setting the stage for considering possible ideas for reform where the current base state of the payments system is found wanting.

*What Is a Payment?*

To understand the performance of the U.S. payment system, it helps to first understand how payments work. Cash payments are the easiest place to start. When we have cash in hand, it is our property: that is, we have the right to make a claim against the central bank for the full value represented by the dollar bill. Cash is, therefore, a bearer instrument: the person who holds it owns it can transfer it to another person by the act of handing over possession. Cash is also anonymous. A supermarket teller does not first check whether their customer has title to the cash before accepting it in return for groceries. The fact that cash is a bearer asset also means that it can be stolen or lost, meaning that the holder no longer has possession of the physical asset.\(^a\)

*Some Bank-Based Payment Methods*

As noted above, money held in a bank is different from cash in-hand. The bank becomes a custodian of the money, and its customer has a contractual — rather than property-based — claim to collect it.\(^o\) Bank money is not anonymous: a customer must be identifiable as the bank’s counterparty. It is not possible for the customer to “hand over” bank money to someone else. It does not sit with the customer. Rather, it is held by the bank as a debt owed by the bank to the customer and the bank must be instructed on what to do with it.

Bank transfers represent a way to move a payor’s money from the payor’s bank to that of the payee.\(^o\) A basic bank transfer works like this:

- A payor tells their bank to transfer $100 to a payee. When the payor does this, they are asking for the liability owed to them by the bank to be decreased by $100.

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\(^{a}\) See generally, Awrey, *Unbundling Money, Banking and Payments*, supra note [29].
\(^{o}\) Cheng & Torregrossa, *supra note* [19].
\(^{o}\) Sommer, *supra note* [23].
\(^{a}\) Sommer, *supra note* [23], 7; Cheng & Torregrossa, *supra note* [19].
• The payor’s bank tells the payee’s bank that it will be sending $100 for the payee. It debits the payor’s account, extinguishing that liability to the payor.
• The payee’s bank receives the $100. It credits the account of the payee with $100.
• The payee’s bank now has an additional $100 liability to the payee.

Some of the most well-known payment innovations are intended to streamline the process of transferring a payor’s claim against a bank to another person. Rather than instructing their bank each time they want to send some money to someone else – with all the inconvenience that can entail – a payor hands over an actual or virtual instrument giving the payee the right to redeem a claim against the payor’s bank.

Banks have long offered a number of commonly-known innovations to aid this process, including checks, travelers’ checks, and direct payments. A brief description of each method is set out in the Glossary. While offering numerous conveniences, these methods are also showing inefficiencies that have become readily apparent in the digital era. For example, processing checks generally involves time. Even with modern image-submission and clearing methods, checks can take multiple business days to be processed after being submitted by the payee to their bank. Travelers’ checks require cumbersome by-hand vetting processes and can entail high fees. And direct payments – such as those involved in making recurring bill payments – often also take multiple days to be processed and to land in the payee’s account. Moreover, once set up, direct payments can often be administratively unwieldy, necessitating sometimes complex and slow methods to unwind them. This can leave a consumer vulnerable to making a slew of unintentional payments or being exposed to unscrupulous vendors looking to take advantage of tricky processes that can take time to undo.

Some Non-Bank Payment Methods

Non-banks have also come to play a pivotal role in providing payment services and driving innovation in their delivery. Certain non-banks, like credit cards network providers (e.g., Visa/Mastercard) or international money remitters (e.g., Western Union) are deeply rooted historically within the payments ecosystem and a part of people’s everyday economic lives. More recent innovations – like digital wallets on smartphones or peer-to-peer payment technologies (e.g., Cash App, Venmo) have seen rapid adoption, enabling convenience and speed in payments delivery and offering services that have enlarged those offered by the banking system. Yet, despite their popularity and widespread use, technologies offered by non-bank payment providers still rely on traditional bank-centered payment settlement infrastructure to be finally processed and settled. This can mean that using these technologies can take on higher costs in the form of fees and delays where money must be finally moved off a non-bank payment service (e.g., a digital wallet) and to a customer’s bank account.

Payment Card Networks
Payment card networks are some of the most commonly-used and visible non-bank innovations in the economy. Cards constitute a fast, convenient, and generally secure method of payment that is widely accepted by merchants around the world, both in-person and over the internet. A quick glance at the numbers makes clear just how popular payment cards have become. In 2015, 66.5% of all American households owned a credit card; by 2019, this number had grown to 71.3%. In 2015, credit cards enabled 29.7 billion payments to occur in the United States, with a value of $1.6 trillion. Just three years later, 131.2 billion such payments were being made with a total value of $7.1 trillion. Credit card payments comprised around 34% of all card payments in 2018. By the second quarter of 2022, the United States was home to a record 500 million general-purpose credit cards. In the course of a single year, from 2021 to 2022, adoption of credit cards by members of Gen-Z rose by 31.7%. Debit cards represented around 55% of all card payments in 2018, and prepaid cards were used to make 10.5% of all card payments in that year.

To be sure, despite this expansive use, there can also be downsides to card payments. By reducing the “pain of paying” in the moment, for example, customers can risk accumulating excessive levels of personal debt. While credit cards are fast and convenient, merchants routinely pay fees for using card networks, which can become a meaningful cost of doing business especially for smaller businesses and start-ups. Merchants often pay anywhere from 1.5% to 3.5% for credit card transactions. Prepaid cards, though convenient for many, can also often be costly for their holders, requiring regular payments of use and maintenance fees.

Peer-to-Peer Payment Networks

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Digital P2P payment services fill the gap left by the difficulties of sending bank transfers between people, as well as the inability of everyday people to accept payment cards for things like shared expenses (e.g., a taxi ride). These services rely on digital wallets, accessible on smartphones and laptops, for storing and transmitting value. Services like Cash App, Venmo, and Zelle (a bank-owned service) provide wallets and messaging networks that enable the transmission of payment orders directly from one person to another, usually by connecting to the customer’s bank account or payment card. By using such P2P services, users can send payments by reference to each other’s user handle, emails, or phone numbers without the need to share sensitive bank or card information. Payments between users are processed quickly. If a user receives $100 on a P2P service, this sum is immediately reflected in the user’s P2P account as a credit. This balance can then be used straightaway, in whole or in part, and the user’s balance is generally updated in real time.\(^7\)

This functionality has shifted the ways in which people organize their economic relationships. Friends can easily and immediately split a restaurant bill or divide rent payments and household expenses, for instance.\(^6\) Perhaps unsurprisingly, given this convenience, mobile P2P payment apps have enjoyed broad uptake. According to one survey conducted prior to the COVID-19 pandemic, 94% of millennials reported using mobile payment apps, such as the various P2P payment apps, compared to around 87% of Gen-Z, 88% of Gen X, and 65% of consumers aged 56 and older.\(^9\)

While users can maintain an ongoing balance on P2P services, cashing out requires the service to post the money to a bank account. This means that, despite being a popular digital innovation, non-bank P2P services (e.g., Cash App, Venmo), which lack Fed master accounts, must send money to customers’ bank accounts by using the usual bank-based settlement infrastructure.\(^7\) That is, when customers want to extract the money in their Cash App or Venmo wallet, a bank transfer is needed from Cash App’s or Venmo’s bank account to that of the customer. Using normal settlement rails means that customers usually have to wait multiple days to see money land in their bank account.

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\(^7\) See, e.g., Ellen Sheng, Peer-to-Peer Payment Apps like Venmo, Cash, PayPal are Booming. Do You Still Need a Bank? CNBC (Apr. 11, 2022), https://www.cnbc.com/2022/04/11/how-to-use-peer-to-peer-payment-apps-like-venmo-cash-paypal-zelle.html. As detailed below, these payment orders are ultimately settled using bank-based settlement systems, mainly the ACH network.

\(^6\) See generally, Amelia Acker & Dhiraj Murthy, What is Venmo? A Descriptive Analysis of Social Features in the Mobile Payment Platform, 52 Telematics & Informatics (2020) (detailing the use of the social media features embedded within Venmo as well as highlighting the growth of social media influence as part of payments).


\(^9\) It is possible for customers to keep a cash balance on the app itself, which can be cashed out by transferring it to a person’s bank account. In the case of Cash App and Venmo, for example, a customer may qualify to have payments from employers sent through direct deposit to their Cash App/Venmo account. Funds sent through direct deposit to Venmo, for example, are maintained at a bank account with FDIC pass-through insurance, Venmo, User Agreement: Receiving Money Into Your Venmo Account: Direct Deposit (Sept. 14, 2022), https://venmo.com/legal/us-user-agreement; Cash App, Direct Deposit, https://cash.app/help/us/en/us/1113-direct-deposit.
To instantly post money to a bank account, however, non-bank P2P services create partnerships with specific banks capable of sending and settling payments instantly. But such upgraded intermediation invariably means expense. This fast-payments service costs customers a fee of 0.5%-1.75% of their total transfer, the minimum charge being $0.25 and the maximum being $25. As noted above, users who do not wish to pay such fees must wait the standard one to three business days for their money to post to their bank account using the usual settlement rails.

As detailed above, the reason why non-banks like P2P payment services providers or card networks must construct multi-step processes to transfer and settle money lies in the fundamental design of U.S. payments infrastructure. That is, only banks can issue deposits; and only banks typically gain access to Fed master accounts, benefitting from the direct entry this enables into essential payment settlement networks. It follows that non-banks must adapt their internal businesses to manage the costs associated with lacking access to Fed accounts and to the large-value payment settlement systems that finalize money transfers between user accounts.

Bank-Based Settlement Rails for Payments

With exclusive power to issue deposits and to also hold master accounts, banks have come to provide the structural rails on which payments are cleared and settled. In other words, the banking system must be engaged in the final legs of most payment transactions to process and settle by transferring money from one bank account to another.

In the United States, a few large-value payment systems exist to verify and settle payments. Two systems carry particular importance and are distinctive in the kinds of payments they process and the settlement mechanisms that they use: (i) the Automated Clearing House (ACH) system, a critical network for processing payments for multiple retail-facing payment schemes (e.g., direct payments, credit card bills.); and (ii) Fedwire, a system for processing large-value payments between financial institutions. Both systems depend on banks using their master accounts for final settlement. Further details on these payment mechanisms can be found in the Glossary.

The Automated Clearing House

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63 Awrey, Unbundling Money, Banking and Payments, supra note [29], 720-723 (noting the exclusion of non-bank companies from Fed master accounts).
64 See, e.g., Awrey, Unbundling Money, Banking and Payments, supra note [29], 716-717.
The ACH network comprises a nationwide network of banks that clear and settle payments using a net-settlement model (on net settlement, see Glossary). The ACH network relies on two sub-networks that operate in parallel. The first is run and overseen by the Fed – the FedACH. The other is operated privately by The Electronic Payments Network (EPN), a service that is owned by the Clearing House – an organization run by major banks. The ACH network is the mainstay for clearing and settling payments such as repeating direct payments, payroll, payments for utility bills, mortgages, Social Security, and other government benefits (e.g., tax refunds) as well as for certain one-time payments like check-based transfers. In 2022, the ACH network processed 30 billion transactions totaling around $77 trillion in value.

The ACH network plays an essential role in processing the everyday payment needs of consumers and businesses – such that it is reasonable to imagine that most adult Americans have some direct and regular connection with the service. It is essential to making certain that people, businesses, and government agencies can participate efficiently within the real economy.

ACH processing relies on each participating bank sending batches of payment messages to the Fed at regular intervals throughout the day. Once the Fed receives these files, it sets about processing them, verifying payment details and determining the relative credits and debits accruing to each bank within the network. After this checking is completed, the Fed knows the net payments that are owing between various banks and can simply adjust the master accounts of the firms to reflect their new and updated balances. In the case of the private EPN network, once clearing is completed by the EPN, settlement instructions are sent to the Fed to progress reconciliation of participating master accounts.

ACH payments can take at least one business day to finalize and settle, if not usually longer. Exactly how long payments take to settle depends on a number of factors, with the consequence that settlement times can vary from as short as same-day settlement to as long as three to five days.

Three factors are key when it comes to working out settlement times. Firstly, deadlines governing the batching process determine when the customer’s order is sent to the Fed/EPN and how quickly it is cleared. Secondy, processing times depend on the opening hours of the Fed. Because master accounts must be debited and credited, the ultimate capacity of the ACH system to release funds depends on when the Fed is open. As a general rule, the Fed does not open on weekends or public holidays. Even if the EPN clears a batch of transactions over the weekend, final payments cannot

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66 Cooper, Labonte & Perkins, supra note [65], 12.
67 Cooper, Labonte & Perkins, supra note [65], Table A-1; Committee on Payment and Settlement Systems, United States, Red Book, 493 (2012).
68 NACHA, About Us, https://www.nacha.org/content/about-us, NACHA represents the overarching governance body for both ACH services. As part of its role, it sets rules and standards for the operation of the services, as well as conducts enforcement and adjudication to give effect to this oversight framework.
69 NACHA, What is ACH?, https://www.nacha.org/content/what-is-ach (noting that, “ACH Almost Certainly Touches Your Life”).
70 When referencing the Fed, it reflects the fact that banks send their files to one of the twelve regional Federal Reserve Banks.
move to settlement until the Fed opens. Thirdly, the ACH system affords choice. In addition to a “standard” cycle, customers can choose a “same-day” option, which aims to ensure settlement within the same business day.

The exact time at which the customer submits an instruction is critically important. If they miss the cut-off time for a particular batch, then their order will only be processed in the next one. A customer that misses the deadline for submitting orders on a Friday afternoon and holding an account with a bank that is closed on weekends, will only see their order start to be processed on the following Monday. This means that a customer requesting a same-day settlement on a Friday cannot actually enjoy same-day service if they happen to have missed the deadline for their bank’s final Friday batch. For standard (not same-day) ACH orders, payments can take one to two business days to process and settle. For businesses looking to ensure that their employees are paid on time and using a standard service, instructions to their paying bank must be dispatched with enough time in advance to allow settlement to finalize. Finally, it is worth noting that even same-day service can come with limiting conditions. It generally involves higher fees. Also, not all banks offer to originate a same-day transaction (though all have to accept one). Dollar ceilings apply – such that no single payment instruction can exceed $25,000.

Fedwire. Fedwire showcases a different model of settlement (for more, see Glossary). Again, it centers on banks and is operated by the Fed. Unlike the ACH network, that specializes in retail-based payments to process bills or salary payments, Fedwire differentiates itself by working to process large-value payments between financial institutions (e.g., to ensure that a Bank receives the $100 million its client is owed for selling a portfolio of securities). Its sheer scale highlights the foundational role it plays for financial markets. In 2022, Fedwire processed transactions exceeding a dollar value in excess of $100 trillion. The average dollar value of a Fedwire transfer in 2022 was $5.41 million.

Importantly, this service only provides banks with a system to perform “push” credit transfers. Unlike the versatility of the ACH network that permits originating banks to “pull” money as well as push it, the Fedwire model represents a one-way payments highway. With funds aiming to move as close to real-time as possible while also settling in central bank money, payments are final and irrevocable as soon as their value is credited to master accounts.

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Electronic copy available at: https://ssrn.com/abstract=4425922
It is easy to see why Fedwire ranks as arguably the most vital payments system for global finance. It accommodates soaring payment volumes and carries enormous monetary values. In facilitating such high-dollar transactions rapidly and with certainty, it anchors sophisticated and efficient capital markets, international trade, and monetary policy. Moreover, it offers an operational thoroughfare to protect financial markets by enabling the time-critical movement of money to meet demands for cash liquidity in times of crisis. Because payments are settled in real-time, on a gross basis and with finality, banks know that the money is fully theirs as soon as it lands in their master account. This helps them manage their cash needs without their money wastefully languishing within lengthy settlement processes.

But this system can also make steep financial demands of participants. In order to prevent liquidity crashes where the system seizes up because firms lack cash during the day (e.g., because they have to make a large payment before they can receive one in return), the Fed provides participants with intraday credit. Such overdraft facilities are neither cheap, nor unlimited. Efforts at avoiding them can prompt institutions to alter their behavior in ways that can be damaging for the system as a whole (e.g., by seeking to schedule payments toward the end of the day, when banks may have more cash-on-hand). The Fed is legally required to try and shield itself from credit risks by charging banks for the service, imposing caps and setting out guidelines on collateral. That being said, the Fed’s available financing does assure that they can smooth over their cash needs as part of running a payments business for their own accounts as well as for those of their clients.

D. Some Critical Perspectives on the U.S. Payments System

For many users, payments in the United States are neither direct nor simple. As a result of its current design and functioning, the U.S. system falls short of its potential in a number of key areas: (i) financial and economic inclusion; (ii) speed and efficiency; and (iii) providing cost-effective, reliable and nimble U.S. dollar international payments. The persistence of these problems in the U.S. dollar payment system looks especially acute when viewed against the backdrop of innovations being embraced in other countries—a pressing strategic problem for a country that boasts the preeminent financial market and reserve currency within the global economic system.

Financial and Economic Inclusion

Because banks are so central to the U.S. payments system, it is important for everyone to have access to a core set of banking services in order to participate fully in the economy. In reality, however,

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9 Board of Governors of the Federal Reserve System, Payment System Risk Policy, supra note [78],18-21 (detailing the procedures and processes that the Fed puts in place in order to try and mitigate the credit and liquidity risks faced as part of running the Fedwire payments system).
U.S. banking suffers from chronic underachievement in ensuring that everyone has access to basic, affordable banking and payments products. Approximately 4.5% of U.S. households are unbanked—meaning that no one in the household has access to a checking or savings account at either a bank or a credit union. While this figure is the lowest it has been since tracking began, rates of financial exclusion are much higher among communities of color, for those without a high school education, and low-income households. In 2021, the unbanked included 11.3% of Black households, 9.3% of Hispanic households, and 6.9% of Native American and Alaskan Native households (down from 16.3% in 2019). Measuring by income, 19.8% of households with annual income below $15,000 were unbanked. In households where members did not have a high school diploma, rates of being unbanked stood at 19.2%. 14.8% of households with disabled members between the ages of 25-64 were unbanked.

Underbanking is also most common among poor households, for those without a high school diploma and people of color. This term refers to the phenomenon where households have access to a bank account but still have to use high-cost alternative, non-bank services (like payday lending, pawn shop loans, check cashing, or tax refund advances) to meet their immediate liquidity needs. In 2021, around 14.1% of U.S. households were underbanked. While the number of people who are unbanked and underbanked has been falling, the United States lags noticeably behind other developed countries on measures of financial inclusion and shows a clear gap in the quality of banking available to richer relative to poorer households.

Without frequent access to a bank account and related services, the un-and-underbanked frequently rely on cash and prepaid cards, despite the overall secular decline in the use of cash as a medium of payment. In the case of cash, in 2020, unbanked consumers used cash in 60% of their payment transactions, compared to 19% for those who were banked. This reliance on cash has the effect of further distancing people in underserved communities from the conveniences being promised by digital, non-cash payment mechanisms (e.g., portability, safety, and security).

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"Federal Deposit Insurance Corporation, supra note [80], 1, 13 (the FDIC notes that this figure is the lowest since 2009, when the survey officially began).

"Federal Deposit Insurance Corporation, supra note [80], 13-15.


"Board of Governors of the Federal Reserve System, Economic Well-Being of U.S. Households, supra note [83].


"Board of Governors of the Federal Reserve System, Economic Well-Being of U.S. Households, supra note [83].


"Boel & Zimmerman, supra note [87].
Prepaid cards also function as a go-to payments solution for those that lack adequate banking services. These kinds of cards allow holders to pay bills, use ATMs, and make everyday purchases. But pre-paid cards are often more expensive than checking accounts, requiring sign-up and maintenance fees as well as incremental fees for every purchase. Moreover, they do not generally offer individuals opportunities to build savings or create a relationship with a financial institution that can open up future possibilities to obtain credit and other financial services on affordable and productive terms. In 2021, for example, 12.6% of Black households transacted using pre-paid cards relative to 5.8% of White households. Prepaid card use was common among the unbanked, with 32.8% of unbanked households relying on them, compared to 5.7% of banked households.

There are many complex reasons why underserved communities remain outside of, or on the periphery of, the banking system. Banks frequently impose minimum balance requirements, charge high fees, and typically levy charges for using facilities like overdrafts or obtaining checkbooks. According to one study conducted by researchers at the Federal Reserve Bank of Boston, the likelihood that bank customers end up paying fees is correlated with their demographic characteristics. Notably, the authors found that Black customers are “significantly” more likely to pay low-balance or overdraft fees than White customers, controlling for the amount of money that customers held in the account. According to the study, 17.3% of Black customers were subject to overdraft fees, compared to 10% of White customers. Looking at income, overdraft fees were common for those that had some of the lowest credit scores (under 600) compared to those in the highest credit score bracket (over 800), with 32% of those with low credit scores paying such fees, compared to 2% of those with high scores. In addition to various kinds of fees, people from economically vulnerable communities may be paid relatively more frequently in cash relative to those from higher income households; they may lack the documentation banks require to open and maintain an account. A lack of trust in the banking system is also widespread.

The banking sector has faced criticism for lacking sufficient urgency to alleviate the problem of financial exclusion. A number of studies point to persistent disparities in lending to Black and Latinx customers relative to those who are White, despite legislation designed not only to prohibit discrimination but to expand access to financial services in underserved communities. Black and Latinx borrowers are denied loans at higher rates than White applicants despite similar incomes.

80 Boel & Zimmerman, supra note [87].
82 Boel & Zimmerman, supra note [87].
83 Federal Deposit Insurance Corporation, supra note [80], 30-32 (the 2021 survey also notes that pre-paid cards serve to provide access to a variety of services for the unbanked, such as paying bills and receiving income).
84 Oz Shy & Joanna Stavins, Who Is Paying All These Fees? An Empirical Analysis of Bank Account and Credit Card Fees, Federal Reserve Bank of Boston Working Paper Number 22-18, 67 (Aug. 2022) (the study also noted a similar pattern for credit card fees).
85 Boel & Zimmerman, supra note [87]; Federal Deposit Insurance Corporation, supra note [80], 2-3.
The emphasis on credit scoring and on collateral for loans has led to the exclusion of minority communities that have historically struggled to accumulate intergenerational wealth and a deep base of assets. The use of local bank branches has generally been shown to improve a borrower’s ability to get a loan. But lower-income and inner-city neighborhoods have experienced a sharp decline in branch numbers – and banks compete less to sell financial services in Black and Latinx neighborhoods compared to efforts made in zip codes without majority Black or Latinx populations. Online banking solutions might appear to offer a solution to the problem of shuttered local branches – but limited internet connectivity and a lack of connected devices create hurdles for people in lower income communities. And despite the overall expansion in digital banking, lower income and households with lower levels of formal education are twice as likely to use bank branches.

Taken as a whole, these observations point to a nuanced reality in which a person’s payments options reflect the dynamics of a wider economic system that compounds the consequences of financial access and also exclusion. By relying heavily on the banking system to offer fullest enjoyment of payment choices, policy’s effects are to leave many on the outside or on the periphery, where the availability of banking services is limited or overly expensive.

**Speed and Efficiency**

Fully-banked Americans also experience economic difficulties because of a relatively slow and economically costly payments settlement infrastructure. At first glance, the speed of payment processing might seem like an issue of convenience. But it has real economic effects, particularly for those people and businesses struggling to manage their liquidity needs and trying to ensure that they can get the most value out of their money.

While much of the U.S. financial system aims to move at lightning-fast speeds, the infrastructure for processing payments tolerates delays of multiple days for funds to be received and credited to customer bank accounts. This is arguably most true for payments that are retail-facing. Check-
clearing, the ACH network, and even credit card settlement assume that money will take at least one (if not, often, multiple more) days to reach the beneficiary’s account and be ready for use -even when instant-seeming P2P payment apps and digital wallets are used. The base-level payments infrastructure, then, necessarily limits the speed, costs, and efficiency involved in settling payments that are made using innovations and technologies built on top of these underlying rails.

These delays can hurt a person’s capacity to make a full living - a factor that has taken on special importance in the context of the growing U.S. gig economy. According to a 2021 survey, 16% of Americans reported having worked a job in the gig economy - driving for a ride-hailing app, for example, shopping for and delivering groceries, or doing general household tasks. Gig workers are more likely to come from communities of color, with 30% of surveyed Latinx adults and 20% of Black adults reporting participation compared to 12% of White survey respondents. Gig-work, non-contract based and often driven by volume, underscores the importance of speed of payment. Efficient payments are critical for gig workers who need to pay bills quickly. Those working for ride-hailing apps or delivering food and groceries, for example, must be able to cover the costs of fuel on a daily basis - otherwise, their very ability to work is at risk. Yet for the most part, the U.S. gig economy pays its workers using ACH direct deposits, adding day(s) of delay to their ability to access earnings and undermining their capacity to maximize their working potential.

For many people, such delays can be financially devastating. A gap in time between when bills are due and when money arrives in a bank account can lead to expensive bridge financing. Individuals might look to payday lenders, check cashers, or overdrafts; and the fees associated with these stopgap methods erodes the savings people are able to accrue. Between 2010-2020, lower-income Americans are said to have lost around $100 billion in payouts for check cashing, pay-day lending, and other fees. According to one estimate, lower-income Americans could save around $7 billion annually if they are able to receive payments in real-time.

Lengthy settlement times also impact the cost of providing payment services within the larger financial system. Payment services providers have to account for the fact that the movement of funds from sender to recipient takes time. The gap in time between a payment being sent out and being received can mean that accounts end up lacking sufficient cash to make payments, creating credit

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64 Faster options are available at added cost. For discussion see sources cited supra note [61].


67 Aaron Klein & George Selgin, We Shouldn’t Have to Wait for FedNow to Have Faster Payments, Brookings (Mar. 3, 2020), https://www.brookings.edu/opinions/we-shouldnt-have-to-wait-for-fednow-to-have-faster-payments/.

68 Klein, supra note [104] (this reflects the costs saved in paying for expensive bridge financing).
risk for a payment service provider. Providers must make accommodations and provisions, like extending short-term credit, providing a running overdraft facility, or constantly monitoring for situations when such credit might be needed. A faster payments processing system can reduce gaps and limit the credit exposure routinely expected to be shouldered by payment providers.

Risks can also arise while funds are traveling between accounts. Most dramatically, of course, a bank might fail. As banks tend to be put into insolvency on a Friday evening, an ACH payment sent by a sender on Friday afternoon will most likely be received by the failed banking entity early in the following week. While the federal government’s bank insolvency processes (administered by the Federal Deposit Insurance Corporation or FDIC) should work to ensure that customers finally do receive their money, the extra administrative hurdle and customer stress involved would be much less likely to arise in a world of faster or more real-time payments. Money sent on the Friday afternoon would be received and credited to the recipient’s account a few seconds or minutes later. In this hypothetical scenario, the payee would have their funds in hand before its bank fell into insolvency and be in a much more confident position knowing that their money is protected (e.g., under FDIC deposit insurance).

**E. International Comparisons: How Other Countries Structure Their Payment Systems**

As the United States contends with these structural drawbacks, it is worth taking a brief look at approaches taken by other countries seeking to tackle inefficiencies and a lack of access within their domestic payment markets. Nations around the world have witnessed the rise of digital innovation, smartphone adoption, the growth of social media, and efforts to develop creative, inviting interfaces between users and technology-savvy payment services providers. Policy responses to these developments offer some lessons in merging emerging innovations into existing payment services, while also seeking to preserve the safety and integrity of the overall system.

Many countries have sought to institute faster payments as a way of increasing the economic productivity of money. These countries have also focused systematically and ambitiously on innovating in the payments system as a means of mitigating financial exclusion. By developing new ways to make and receive payments, payments policy has sought to foster channels that can bring people and businesses much more fully into the formal economy - or at least into a financial environment where money can move safely, securely, cheaply, and quickly.

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*Infrastructure Development*

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Perhaps the most visible demonstration of a concerted policy emphasis on upgrading domestic payments systems can be seen in the development of instant, or real-time payment schemes around the world – a trend that has experienced added momentum in the wake of the COVID-19 pandemic. Many countries and regions have sought to create new payment rails capable of enabling user-friendly, digital, cheap, instant or very quick, and person-to-person/account-to-account payments as a critical part of their domestic financial infrastructure. In a 2021 study surveying 53 countries, India has led the way in transaction volumes, with China, Thailand, Brazil, and South Korea, completing the top five of the most active countries for real-time payments in 2021. Some of the fastest growth rates for real-time payments have been seen in Brazil, Oman, India, Phillipines, and Malaysia. In 2021, over 118.3 billion real-time payment transactions were processed around the world. This marked a year-on-year growth rate of 64.5%, arguably also reflecting COVID-19’s contribution as a transformative shock for shifting payment habits away from physical cash and toward digital payments. The popularity of mobile wallets has also soared alongside adoption of real-time payments, with use becoming widespread in historically cash-driven economies.

India, for example, rolled out its Unified Payments Interface (UPI) in 2016. This scheme for making instant payments was designed to be user-friendly, cheap, and interoperable with a range of devices and applications, including commonly used apps like WhatsApp. In 2021, 48.6 billion real-time transactions took place on UPI, far ahead of other countries, including China, and exceeding projected forecasts for uptake and use. Innovations are underway to make UPI usable in a range of contexts, including in international remittances. Reports suggest that, in 2021, real-time payments resulted in cost savings to Indian consumers and businesses of around $12.6 billion, alongside estimated economic output of $16.4 billion. Indian businesses like the ride-hailing app Ola use UPI to enable instant payments to drivers. Economic productivity from speedier payments ranks as a specific policy rationale in its design.

The case of the Pix system in Brazil is perhaps the most striking recent example of policy innovation in real-time digital payments. In the years prior to its launch, the Brazilian payments market suffered from high fees and extensive reliance on cash: almost 77% of all retail transactions were conducted in cash. Consumers would routinely have to find ways to pay cash/cash substitutes even for online purchases because the expense involved in making electronic payments was too high. Payments

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112 Deloitte, supra note 109, 35-36.
115 The Economist, *Digital Payments Have Gone Viral in Brazil* (May 14, 2022).
made through cards accrued high fees and sometimes took 30 days to become available to merchants. And though Brazil has historically led Latin America in banking its citizens - with around 70% of Brazilians having a transaction account in 2017 - its payment system remained stubbornly under-inclusive.

With a legal mandate to increase financial inclusion and help citizens achieve “financial citizenship,” Brazil’s Central Bank has worked to rapidly transform its domestic payment infrastructure. The Central Bank began working on the concept in 2018; and by November 2020, it had launched “Pix” as a fast, P2P electronic payment settlement system for the country. In just two years, Pix has entirely remade Brazil’s monetary architecture - and empowered some of the country’s most economically vulnerable citizens. A few features have been recognized as being particularly effective. For a start, the payments system does not require a bank account. The system is designed to be user-friendly, employing a quick set-up with easy handles or addresses for transmitting money. QR-codes allow users to send payments to and from one another without giving away personal data. Crucially, the system is free for retail participants. Finally, to ensure rapid uptake, Brazil opened the scheme to non-bank payment service providers. This has helped grow the scheme’s utility and network profile quickly, as well as its appeal to merchant businesses. Seeing a popular scheme evolve rapidly, even smaller payment services providers have had incentives to join.

By February 2022, 67% of Brazil’s population (114 million individuals) had made or received a Pix-based payment. 12.4 billion transactions have been processed, valued at $1.2 trillion. And 9.1 million companies have signed up, or 60% of all companies that are members of the national financial system. Perhaps most strikingly, Pix has brought people into the formal financial system who had never been there before. Because COVID-19 government support payments were made using Pix, 30 million unbanked Brazilians received a digital payment for the first time. 50 million people who had not made any kind of account-to-account payments a year before the scheme’s launch used Pix to make digitally-based transactions. Pix is even being used by those working in Brazil’s street

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110 Brandt, supra note [117].
114 Though in its period of operation over the COVID-19 pandemic, Brazil has reduced the number of its unbanked citizens by 7%.
115 The Economist, supra note [118].
116 The Economist, supra note [118]; Duarte et al., supra note [120], 5-6.
117 The Economist, supra note [118].
118 Central Banking, Payments and Infrastructure, supra note [122].
119 Duarte et al., supra note [120], 5-6; The Economist, supra note [118].
120 The Economist, supra note [118].
121 Duarte et al., supra note [120], 5-6; The Economist, supra note [118].
economy. These trends point to the broad inclusion of those who had not previously used digital payment mechanisms and engaged formally within the real economy.130

To be sure, Pix is not perfect. Security issues have been raised: for example, robbers have forced victims to transfer money over Pix.131 But the rapid, remarkable gains of the scheme are also self-evident, as is the potential for future innovation to take place on Pix-based payment rails.

It is perhaps understandable why emerging economies have come to comprise some of the most active and enthusiastic adopters of real-time payment schemes – and why domestic policies have focused heavily on prioritizing their growth. The historic prevalence of cash, low penetration of payment cards, and expensive banking services in marketplaces where large numbers of people are engaged in the informal economy, create urgency for accessible real-time payment schemes.132 Thailand’s PromptPay scheme, for example, was launched in 2017, and promoted itself to the underbanked and unbanked with a convenient onboarding process and a free service for low-value retail payments. Like Pix, PromptPay, too, has experienced eye-catching gains, with an average annual growth rate of 116%, reaching 43 million subscribers by 2019.133

But more developed economies are also investing in the creation of real-time payments infrastructure, with adoption often impacting domestic economies in important ways, and spurring the production of previously unavailable economic efficiencies.

Take Singapore. The city-state’s real-time payments ecosystem forms part of its Smart Financial Center policy, which seeks to create a digitized economy.134 Prior to the introduction of real-time payments, bank-based transfers could take up to three business days to settle. Payments were heavily dependent on cash and checks.135 In response, a real-time payments system – known as Fast and Secure Transfers (FAST) – was introduced in 2014 as a scheme involving 20 banks, promising to enable payments to move virtually instantly 24/7/365. FAST facilitates transfers between bank accounts. It also allows customers to move money to fund credit and debit cards. Importantly, FAST has provided a payment rail on which other types of services are being constructed as a means of advancing Singapore’s transition to a digitized marketplace. The rapid and expansive adoption,
However – as seen in Brazil or India, for example – proved to be more elusive. Singaporeans continued to use checks – and businesses were slow to migrate.\textsuperscript{136}

But FAST provided the rail on which Singapore launched PayNow in 2017 – a P2P, instant-settlement, user-friendly, money transfer service. PayNow allows users to send money using easy identifiers like a QR-code. It also comes with a newer, business-focused version – PayNow Corporate – allowing any company to receive PayNow instant payments and to send B2B payments quickly. PayNow Corporate also allows businesses to offer customers new kinds of service, including rapid refunds, convenient collections and online payments.\textsuperscript{137} And, crucially, in a bid to widen adoption and improve FAST/PayNow’s capacity to solve for the “last mile” problem, Singapore opened the schemes to licensed non-bank financial institutions, whose customers could then also access real-time payments. Authorized non-banks (e.g., e-wallet providers) received permission to directly access FAST/PayNow, with policy looking to include customers of non-bank payment firms (e.g., e-wallet providers) within a digitizing payments ecosystem and to decisively untether the economy from cash and checks.\textsuperscript{138}

The United Kingdom has looked to its Faster Payments service since 2008 to offer real-time payments. Prior to the introduction of the service, the U.K. payment system was similar to that of the U.S. currently. Cash and checks were common, and large-value payments were settled through services resembling Fedwire and ACH.\textsuperscript{139} But Faster Payments has shifted payment habits and created a wider set of choices.\textsuperscript{140} The scheme allows payments between accounts, with confirmations exchanged in seconds.\textsuperscript{141} Participating institutions settle up with each other three times during the day.\textsuperscript{142} Faster Payments operates around the clock. And the scheme includes non-bank financial institutions as direct participants. To enable this, the Bank of England permits non-banks to hold settlement accounts.\textsuperscript{143} This broader access into the central bank’s monetary system has opened Faster Payments to a more diverse and tech-focused group of payment providers. As with Pix and UPI, the service is free for retail customers.\textsuperscript{144} Perhaps unsurprisingly, its popularity has grown sharply and consistently, with volume surging from around 422 million payments in 2011 to 3.6 billion in 2021.\textsuperscript{145}

\textsuperscript{134} FIS Global, \textit{Flavors supra} note [134].
\textsuperscript{138} Greene \textit{et al.}, \textit{supra} note [139], 3-4. Other kinds of payment options (e.g., payment cards, direct payments (or direct debits as they are known in the U.K.) remain available and widely used. The use of checks, however, has rapidly declined. But note that the Faster Payment scheme is only for credit transfers, meaning that “pull” transactions must be made through other schemes.
\textsuperscript{139} Greene \textit{et al.}, \textit{supra} note [139], 14-16.
\textsuperscript{140} Greene \textit{et al.}, \textit{supra} note [139], 14-16.
\textsuperscript{141} The money remittance firm, TransferWise (now Wise) was the first non-bank to join the scheme. Lea Nonninger, \textit{TransferWise is Now a Part of the UK’s Faster Payments Scheme}, Business Insider (Apr. 19, 2018), https://www.businessinsider.com/transferwise-is-now-a-part-of-the-uk-s-faster-payments-scheme-2018-4.
\textsuperscript{142} Greene \textit{et al.}, \textit{supra} note [139], 37.
\textsuperscript{143} UK Finance, \textit{UK Payments Market Summary 2022, 5} (Aug. 2022).
From the standpoint of promoting economic gains, Faster Payments has encouraged innovation in delivery of payment services. It has also not crowded out more established types of payments, like credit or debit cards. Instead, its infrastructure has come to act as a new payment rail for various payment schemes. For example, payroll services market instant payments as a way to avoid the three-day settlement period for disbursing wages. The Request to Pay service provides an overlay of messaging capability on the Faster Payments network, allowing payors and payees to communicate about a range of decisions about when and how much and to pay. As bill payments migrate to Faster Payments, Request to Pay is seen as a way to provide a responsive mode for invoicing. By enabling greater discussion about invoice payments (e.g., to give struggling customers more time), the service can potentially make the collection process smoother, more interactive, and efficient. One study estimates savings of 8% for businesses as a result of cheaper invoicing.

Sweden also is home to a scheme that has grown deep roots within a sophisticated economy – and generated a variety of use cases for people and businesses. Sweden’s national payment ecosystem stands out for its cashlessness. Cards and online payments have become the norm. The country’s major real-time payments scheme, Swish, grew out of a demand for rapid, electronic payments that could enable funds to flow between people far more quickly than the seven days that it took for bank transfers to settle. Launched in 2012 by a consortium of Sweden’s largest banks, with the support of the country’s monetary authorities, it took off quickly. The Swedish population has rapidly replaced cash with digitally-based payments. Swish is now used by around two-thirds of all Swedes and is embedded in their everyday lives. These sharp network effects and economic benefits have led businesses to opt in, with banks offering additional services to help businesses digitally monitor and allocate funds in light of real-time transfers. Swish is being piloted for in-shop purchases, acting as a proxy for a contactless card. And the scheme is being experimentally tested for cross-border payments by linking with other schemes within Europe.

It is unsurprising that so many countries are embracing inclusive, retail-facing, fast, and low-cost payment schemes. Real-time payment systems have enhanced the ability of local economies to produce additional output. According to one measure, by 2026, real-time payment systems are

18 UK Finance, supra note [14], 54; Greene et al., supra note [139], 4, 14-17.
19 See, e.g., Iris, Faster Payments for Payroll, https://www.iris.co.uk/products/payroll-faster-payments/.
20 Pay.UK, Request to Pay, https://www.requesttopay.co.uk/.
21 Deloitte, supra note [103], 40
23 This digital transformation has left some behind, however. The elderly, refugees, and people with disabilities have faced particular struggles as access to common services like public toilets has become digitized.

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projected to facilitate additional GDP output of around $131 billion in the five largest global real-time payment markets (India, China, Thailand, Brazil, and South Korea).  

F. Beyond Traditional Banking

Non-banks have also become an integral element of most domestic payment systems. In one survey, 73 out of 75 countries noted that non-bank providers of payment services were a part of their national systems. The services and innovations that non-banks provide have proven to be popular in fostering access, convenience, and adaptability within a number of payment systems. Non-banks are performing a variety of activities like issuing electronic money (e.g., pre-paid cards), processing payments, providing digital wallets, and transmitting messaging in relation to money transfers.

Broadly speaking, national policymakers have followed two main approaches to incorporating non-bank institutions within their payment schemes. Some countries use licensing regimes to bring non-banks into the banking system, by authorizing them to narrowly act as “payments-focused banks.” By giving them a type of banking license, former non-bank firms are allowed to directly access payments and settlement schemes that have otherwise been available only to traditional banks. Other countries provide a licensing framework for non-banks, designed to regulate non-banks by granting them permission to engage in a variety of payments-related services and, in some cases, to access settlement infrastructure directly.

Payment Focused Banks

Under a “payments focused bank” approach, a payment firm gets a license to operate as a kind of narrow bank, with the power to issue deposits but not to extend credit. This approach has advantages for policymakers. Payments-related functions remain within a regulated bank-based environment. Regulators can assert oversight to ensure that payments firms are well-resourced, capitalized, and safe. A limited license affords policymakers the opportunity to tailor permissions and rules for a core set of activities relating to payments. The designation of a payment firm as a kind of narrow bank can assure customers that their money is protected (e.g., through deposit insurance), and that the institution can be trusted – potentially enhancing its commercial power and network effects. This kind of bank-lite regime also has advantages for payment firms: compliance costs can be kept relatively manageable (as payments-focused banks are authorized on a much more limited basis), and firms can focus on integrating their primary services - e-wallets, money remittance, P2P payments - into the financial system without taking on the more cumbersome responsibilities that come with holding the status of a traditional bank.

\[154\] ACI Worldwide, Prime-Time for Real-Time, supra note [108], 3.
\[156\] See, e.g., Ehrentraud et al., supra note [155], 15-17.
India’s payment system offers an illustration of this kind of approach, looking to bring former non-bank payment providers into the banking periphery. In 2014/2015, India launched a licensing regime for “payments banks.” A payments bank license enables firms like e-wallet providers to hold customer deposits and to intermediate payments. Such banks can issue limited deposits, including interest-bearing savings products; allow customers to make payments; and offer ATM and debit cards. Credit products - such as credit cards and loans - are prohibited. By virtue of being a bank, such firms fall within the purview of banking regulation, overseen by the Reserve Bank of India (RBI), India’s central bank. They are also allowed to directly enter payment schemes like the UPI, and the RBI’s real-time gross settlement facility – that is open only to banks.137

By ensuring that payments banks can directly access national payment schemes like UPI, Indian policymakers have sought to intertwine payments policies and infrastructure development, with the goal of advancing financial inclusion.138 Payment banks have broadened the availability of formal financial services to a wide cross-section of the economy. For example, mobile e-wallet provider PayTM operates a payment bank serving around 400 million customers.139 India Post, the country’s national postal service, has created a subsidiary, the India Post Payments Bank, that provides a widely networked, public option for no-frills banking across the country.140

The payment bank concept comes with drawbacks. It raises concerns about whether these narrow banks can make enough money to be resilient and profitable. Without the ability to make loans or offer a range of financial services, they may struggle to remain viable and to attract future innovators. Some of India’s payments banks have found that regulatory and logistical challenges have hampered their initial efforts to enroll new customers.161 But the roll-out remains in its early days. At least presently, it appears that the payment bank approach is creating valuable optionality in the banking sector, providing a flexible and potentially scalable model to promote financial services across India’s large and diverse population and economy.

**General Licensing Regimes for E-Money & Payment Services**

A second approach focuses on the development of new licensing frameworks for non-banks that perform payment services. Non-bank firms can be authorized to perform a broad range of payment services, bringing them within a regulated framework while clarifying what services the licensed firms can perform and under what conditions. The model can entail the creation of a specific regime for certain activities (i.e., issuing e-money) as well as a larger, broader framework regulating a wide range of services like payments processing, card issuance, or the provision of digital wallets. This approach

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138 Ray, supra note [137].
can create opportunities to diversify the composition of national payment schemes, while also creating more comprehensive regulatory regimes for firms that might have fallen within a light or even non-existent regulatory perimeter. For example, specific regimes for e-money are commonplace across many countries. A study by the International Monetary Fund (IMF) found that 73 countries had put legal frameworks in place to guide the regulation of e-money issued by non-bank financial institutions. Numerous international regulatory bodies, including the IMF, the World Bank and the Organization for Economic Cooperation and Development (OECD), have engaged in promoting guidance for overseeing e-money and their issuers.

The European Union’s approach to payments oversight offers an instructive example of a policy focus designed to both create discrete regimes for certain activities like e-money issuance as well as more general regulation for non-bank payment providers. Payments have long represented a core pillar of the European economic project – the creation of a Single Market where capital, goods, and services flow freely across the borders of European Union member countries. This goal has led to a concerted policy effort to eliminate national rules and technical standards that hamper a unified and harmonized pan-European payments ecosystem and to encourage the creation of pan-European payments initiatives. This focus has led to at least two major, long-running regulatory projects: the legal regime to regulate e-money; and a wide-ranging oversight model to license non-banks to perform a number of payment-related services.

The European Union implemented its E-Money Directive as early as 2002, with a revised version coming into force in 2011. Under these rules, non-banks can issue e-money, in the form of prepaid cards, for example. Firms licensed in one jurisdiction can passport their services across all countries in the European Union. E-money rules seek to ensure that firms are able to operate safely and to pay out when called on to do so by users, and in ways that their customers anticipate (e.g., paying out in physical cash, rather than through an in-kind distribution). Each issuer must have a system for keeping itself safe (e.g., through adequate and liquid capital buffers), as well as for safeguarding user funds (e.g., by segregating customer funds away from its own). It must engage in careful risk management (e.g., by not giving out big loans from the funds that it receives). A firm must also establish mechanisms to comply with its legal promises (e.g., by giving customers rights to redress). Where a firm can adhere to these and other conditions set out in the law, it gets a chance to do

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163 Dobler et al., supra note [162].
business across the E.U.’s Single Market. E-money firms can operate within a designated regulatory regime, without having to take on the heavier compliance burden of becoming a bank.

The E.U.’s Payment Services Directive (and the revised Payment Services Directive II) exemplifies a more general licensing regime for non-banks, covering a broad range of payment services, including payments processing, remittance, and money transmission. By registering as a payment institution within a member state, and following rules such as those attaching to a firm’s safety and soundness, a firm can passport its services across the entire Single Market. Under the law, a licensed payment services provider based in France, for example, can sell its services to customers in Poland without having to comply with local Polish stipulations. This legal standardization has helped lay the groundwork for E.U.-wide cross-border payments schemes, like those for credit transfers, direct debits, and instant credit transfers.

In addition to the European Union, a number of countries have implemented similar, broad licensing schemes. In 2021, for example, Canada’s Retail Payment Activities Act brought electronic non-bank payment services providers under a federal regime supervised by the Bank of Canada. Rather than have payment services be overseen by Canada’s different provinces and states – with central government only supervising money laundering-related compliance – the new law federalizes supervision generally. As with aspects of the the European Union’s regime, it requires payment firms to register and to deploy standardized risk management procedures.

Japan and Singapore have implemented regimes designed to impose calibrated compliance requirements on payment firms that are tailored to the levels of risk a firm poses. Singapore’s Payment Services Act (2020) covers firms performing any of seven categories of activity. The rules applying to a given firm vary depending on which of the activities it is performing and on what scale. For example, while all licensees must address technological risks, those performing low-risk activities do not need to show compliance with anti-money-laundering rules. The Act sets up a more risk-based model and imposes higher regulatory requirements on those with a larger footprint in the payments system. Like Singapore, Japan supervises firms in accordance with the risks they pose. In 2021, it updated its Payment Services Act, which had earlier offered non-banks a highly circumscribed permission to perform fund transfers, to give non-banks expanded room to offer

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37 Directive 2000/46/EC (e.g., the Directive states that e-money issuers, under the Directive, are not issuing bank deposits).
42 These services comprise: (i) account issuance; (ii) domestic transfers; (iii) merchant acquisition; (iv) digital payment token/exchange; (v) money changing; (vi) e-money issuance; and (vii) cross-border transfers. For discussion, Yap Wai Ming and Joel Seo, Singapore Fintech Updates and the Payment Services Act, Morgan Lewis (May 2020).
43 Ming & Seow, supra note [174].
payment services. Low-value transfers face far fewer compliance requirements, designed to allow smaller non-bank firms to compete and enter the market for digital payments.176

G. Some Innovations in U.S. Payments Infrastructure

The United States has also begun to address infrastructural reform for payments, focused primarily on leveraging the banking system to drive upgrades. Two initiatives are important to highlight.

The first initiative – already in place – is industry-led, piloted by The Clearing House, a consortium of leading banks. The Clearing House’s “Real Time Payments” network was launched in 2017 to offer a system of payments processing available 24 hours a day, seven days a week – without the need to adhere to the Federal Reserve’s working schedule. Its aim lies in ensuring that money is made immediately available and credited to bank customers as soon as funds are received by the payee’s bank. Transactions are processed individually, rather than on a net basis, with a transaction dollar limit of $1 million. By funding accounts rapidly – far faster than the multiple days it might take in the ACH system – the real-time payments network provides users with an intermediated service that makes money available on a more predictable schedule. The system is open to federally insured banks and currently covers roughly 60% of all U.S. deposits.177 RTP costs between one cent and two U.S. dollars and has the capability to process 100,000 or more transaction per minute.178 In Q2 of 2022, the RTP network processed around 40 million transactions, equal to approximately $18 billion.179 But despite its growth, RTP has not seen wide acceptance by smaller banks and credit unions.180

The Federal Reserve is also working to introduce a new payments settlement system, FedNow, by mid-2023. FedNow will serve as a real-time payments service open to banks, designed to make funds rapidly available to bank customers. Whereas Fedwire is meant for financial firms sending large amounts of money to one another, and the ACH network processes a variety of retail payment types that take at least one business day to settle, FedNow is intended to allow bank customers to send payments to one another with rapid settlement. It will remain operational at all times, and it will be supported by the Fed’s ability to provide credit to the system.181

Whether these services can provide the kind of national coverage visible in Brazil, India, Sweden, or the United Kingdom remains to be seen. Much will depend on how much users will have to pay

to use the new schemes. If the expense is too high, network effects will be weak. Other countries have opted for very low-cost or mostly free access to retail customers to quickly boost uptake. Adoption will also depend on which institutions are able to take part in the scheme. Unlike Pix or Faster Payments, which have opened access by including non-bank firms, the U.S. appears to be proposing a more bank-centric path forward. Within the bank-based model, some banks may choose to remain outside the schemes, particularly if they are small, rural, or unable to muster a customer base to use the scheme. Even if non-banks are permitted, participation may end up limited as a practical matter if the costs to such payment service providers to integrate their systems into the network are high. In the case of United Kingdom’s Faster Payments service, estimates suggest that the overall costs to U.K. banks of building and joining the network were relatively affordable: around $307 million to build, install, and maintain the network over seven years; and approximately $77 million for each participant to connect to the service. Finally, if RTP and FedNow are not interoperable with one another, there is a risk that payments volume fragments across networks, meaning that people may operate within one or other network to the exclusion of the other. Without such interoperability and the user volumes it can tap into, the ability of a new network to incentivize innovation as a base payment rail may be heavily circumscribed.

**Faultlines in International Payments**

The shortcomings seen in U.S. dollar payment systems are not limited to the domestic arena. Despite the dominance of the U.S. dollar in international trade and a thriving globalized marketplace for capital, cross-border U.S. dollar payments remain slow and expensive. The system of global remittances exemplifies the high costs facing those seeking to send money abroad.

Domestic and cross-border remittances provide a source of economic sustenance for families and national economies. Workers in one location or country remit money to their families and friends in another as a way to help their loved ones create economic betterment. These flows - usually originating in wealthier regions like the U.S. and sent to more developing economies - have come to constitute a critical source of funding for some countries and regions. The U.S. represents a leading origin point for remittances, with Latin America and the Caribbean being particularly active destinations for payments. According to one report, 200 million people were expected to remit money to support 800 million family members in 2022. Estimates suggest that remittances can represent a significant portion of a country’s gross domestic product. For example, in 2021, remittances comprised approximately 28% and 24% of the respective GDPs of Honduras and

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183 Greene *et al.*, supra note [139], 3.
185 Harris & Maldonado, supra note [184].
Jamaica. In Lebanon, remittances accounted for 54% of GDP in 2021. Money sent to families back home is often seen as being more reliable and impactful than formal foreign assistance.

The remittance business has come to be dominated by a group of specialist companies with strong networks and a base of repeat customers. Western Union and MoneyGram have grown sprawling global businesses, offering both in-person and digitally-based transfers. Remitly, Wise, Xoom, and Zepz represent newer, digitally savvy entrants, with high market share among those sending money electronically, using mobile apps and other digital interfaces.

Like P2P payment providers or credit card networks, remitters must rely on existing bank-centric payment rails, so that even apparently rapid remittances are subject to the costs and delays created by the need for interbank settlement. Crucially, remitters must deal with this issue on an international level. Sending money across borders requires firms to build partnerships with banks around the world. Whereas banks in the U.S. are linked to one another through systems like Fedwire, global payments networks lack this kind of systematization. Remitters need to be creative, while also ensuring that money can be sent safely to its destination. In some cases, a remitter might have a relationship with a global bank with a transnational system of branches and subsidiaries. Some transactions move smoothly, from one bank to another; while others move through a series of subsidiaries; and some, in cases where banks are remote, require the creation of complicated relationships between a series of internationally active, highly-branched banks. The more layers of transmission required for a transaction, the slower and more expensive the payment becomes.

Payment service providers thus confront a host of difficulties. Delays mount with the need to locate these “correspondent” banks. Currency exchange risks are endemic – and lengthy execution times exacerbate the danger of foreign exchange volatility. The complex logistics of international money transmission mean that transfers can come with high costs that can end up falling heavily on people least able to bear them. Fees for cross-border payments vary according to a number of factors. The

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190 Martin et al., supra note [100], 9, 22 (showing that Western Union represented the most popular choice for 31% of survey participants originating money in cash, while Xoom was the choice for 61% of those originating remittances electronically). Other popular options among those surveyed as part of this study included MoneyGram, Ria, La Nacional for cash-based transfers.
191 Martin et al., supra note [100], 9, 22 (showing that Western Union represented the most popular choice for 31% of survey participants originating money in cash, while Xoom was the choice for 61% of those originating remittances electronically). Other popular options among those surveyed as part of this study included MoneyGram, Ria, La Nacional for cash-based transfers. On the emergence of highly digitally orientated entrants, Nina Roberts, Remitly Secures a Foothold in the $700 Billion Global Money Transfer Market with its $300 Million IPO, The Business of Business (Sept. 9, 2021), https://www.businessofbusiness.com/articles/remitly-secures-a-foothold-in-the-700-billion-global-money-transfer-market-with-its-300-million-ipo/.
destination, the route money might take, the length of time for the transfer, the payor’s payment method, and currency fluctuations, are all factors that can add to the final tab. For the fourth quarter of 2021, the World Bank estimated that the average global cost of sending a remittance of $200 came to around 6% of the total transfer ($12).\textsuperscript{192} Outside of the remittance context, the cost of sending and receiving a dollar wire transfer can be high and unpredictable. The charge for an outgoing transfer can be anywhere between $25-50 per transfer and around $15 to receive one.\textsuperscript{193}

The problems faced by the remittance business are echoed across the larger world of international U.S. dollar money transfers. Expensive money transfers pose a special problem for U.S. policymakers: the dominance of the dollar as a global reserve currency for trade and international finance means that inefficiencies affecting the U.S. payment system also affect the rest of the world.

Despite some debate about its resilience, the U.S. dollar overwhelmingly remains the supporting currency for international commerce and finance. Between 1999 and 2019, the share of the dollar as the denominated currency in trade invoicing was 96% in the Americas, 74% in the Asia-Pacific Region and 79% in other parts of the world (excepting the Euro-dominated Europe).\textsuperscript{194} In international finance, 60% of all foreign currency deposits and loans are denominated in US dollars. And at the end of Q2 in 2021, foreign persons held over $950 billion in paper banknotes, then totaling around half of all banknotes in circulation.\textsuperscript{195}

The payment rails for dollar distribution, however, are not keeping up with the need for international efficiencies. To be sure, because the currency is so important, interests around the world appear willing to tolerate high fees to transact in U.S. dollar markets. This affords the dollar a cushion by which to continue operations on expensive and slow infrastructure, blunting the urgency to solve the problem of an increasingly unworkable cross-border USD payments system.

Other regions and countries are working to build instant payment systems to move money quickly across borders and to bolster their geopolitical strength as economic anchors for global trading and capital markets. The U.S. dollar’s closest competitor as a reserve currency – the Euro – constitutes a high-profile example. Detailed earlier, the European Union has been working to create a cross-border payments zone for euro payments designed to create a seamless payments experience across member countries. This Single Euro Payments Area began in 2008 as a way to connect euro payment systems across the European Economic Area and Switzerland, introducing harmonized rules for

\textsuperscript{192} The World Bank, supra note [188]. The highest costs were for transfers to Sub-Saharan Africa (7.8%) and the cheapest for those going to South Asia (4.3%).


\textsuperscript{195} Bertaut, von Beschwitz & Curcuru, supra note [194].
making cross-border credit, debit, card, and mobile payments. SEPA has sought to pursue digital innovations and, recently, in 2014, the Euro Retail Payments Board, chaired by the European Central Bank, highlighted the need for at least one instant, pan-European euro credit transfer scheme. In 2017, the SEPA Instant Credit Transfer Scheme got its start. The scheme seeks to enable instant credit transfers around the clock. The scheme is open to banks as well as non-bank payment services providers licensed within SEPA or by an EEA regulator. Since its launch, it has attracted almost 60% of European payment service providers.

The system is not, of course, truly international: it is limited to the Eurozone itself. And implementation has not been entirely smooth. Only about 13% of all SEPA credit transfers were processed as instant payments in Q2, 2022 - a full three years after launch. Participation in the scheme is optional for payment service providers. Some may choose to take part only as recipient firms, rather than also handling transfers. Instant payments sent to a non-participant simply end up processed as a normal credit transfer. Two other factors are important. First, domestic schemes have achieved considerable successes, with the result that some volume of demand for instant payments is already captured by local networks. Secondly, payment providers can levy a fee for SEPA Instant. Unlike Faster Payments, UPI or Pix, SEPA Instant can, therefore, look more like a premium add-on service than a normal one. This might be discouraging users and resulting in different countries embracing the scheme to varying degrees depending on cost and appetite.

Nevertheless, the effort for policy to pursue fast, cross-border payments is visible. The European Union is not the only bloc looking to increase efficiencies within its international instant payments framework. Citing growth in faster payments platforms, harmonization of standards and continuing failures in international payments infrastructure, global regulators are promoting more rough-and-ready but workable solutions to building global payments. The Asia-Pacific region is a rich environment for the exploration of interlinking domestic payment schemes which function across borders, with around eleven countries operating domestic real-time domestic payments networks. Nascent efforts are underway: Australia’s instant payment scheme, the New Payments Platform, is seeking to introduce facilities for increasing the velocity and convenience of cross-border payments.

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198 European Payments Council, SEPA Instant Credit Transfer, supra note [197].
200 European Payments Council, SEPA Instant Credit Transfer, supra note [197].
201 European Payments Council, SEPA Instant Credit Transfer, supra note [197].
India and Singapore are also seeking to interlink their home fast-payments schemes - UPI and FAST - as a step to enabling cross-border, payments between markets.

Put simply, failure to keep pace with international innovation risks harming the reputational profile and international usability of the U.S. dollar payments system. While the currency’s prominence is not in doubt, staleness, inconvenience, and expense within its payment infrastructure can open it up to questions about its future standing relative to competing economies.

Global policy experiences offer many lessons to U.S. policymakers in seeking to make the country’s payments system more efficient, effective, accessible, and inclusive. As other economic powers also look to build their leadership position within the global monetary architecture, it is worth asking how long the United States can afford to leave its cross-border, U.S. dollar payment infrastructure in a persistent state of chronic and costly neglect.

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Chapter 2: Central Bank Digital Currencies and Stablecoins

A. Innovating the Future of Money

Innovation has always affected the look and feel of money – even the money issued by central banks. In 1991, the Bank of Finland took the decision to issue central bank money for everyday people in electronic form – and it did so with a vision for what money would look and feel like in the decades ahead. It issued Avenue – a smart card that would encode electronic representations of Finland’s national currency. Unlike commercial debit or prepaid cards, Avenue stood for central bank money. It was the most money of money. And, for the first time ever, it was set to circulate not as a bank note, but instead in the form of a card, a first-of-its-kind smart card, that was supposed to be accepted around the country like paper notes and metal coins.

Finnish central bankers sought to create a novel method of payment – but not necessarily a new kind of money. Surprisingly for a smart-card, its use was entirely anonymous. The central bank would track how much currency it issued in aggregate. But it would not monitor the use of funds on any single card. This being the early 1990s, the card did not work online. Rather, information was embedded in a chip. Once the card’s money was spent, its balance decreased. In turn, the value held on terminals used to handle Avenue increased. The merchant’s terminals would be regularly processed by the issuer, and funds transferred to the business’ bank account.

The Bank of Finland believed that, after some time, Avenue would replace around 50% of the low-value coins and notes in circulation. But this never happened. There was a flaw in its design. Initially, the card was not designed to be reloaded. Once it was used up, it would be thrown away. Later, as Avenue’s adoption grew, it could be refilled using normal ATMs. The problem, however, was that reloading cost money. Holders paid a fee every time they put money on Avenue even as other bank services offered free use of ATMs. Users became unhappy. Merchant acceptance dwindled. And after a few years, the Bank of Finland sold Avenue to a group of banks where it became just another private card product.

This Finnish experiment offers important lessons for the present and the future. Even as the idea behind digitally-issued central bank money – central bank digital currency (CBDC) as it is widely known – seems novel, it reflects a familiar drive to innovate in the delivery of even the most money

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207 Grym, supra note [205].
208 Grym, supra note [205], 3.
209 Grym, supra note [205], 5.
211 Gerard, supra note [210].
212 Grym, supra note [205].
makes sense, then, to explore how recent developments in digitally tokenizing money claims, encryption, and programming will affect how money can be issued and circulated by the state and also privately. Within private markets, notably, a number of firms have issued “stablecoins” – digitally tokenized private money claims, where each token is meant to represent the value of one U.S. dollar (or another currency). Often processed using new kinds of settlement rails (e.g., blockchains), stablecoins have garnered particular visibility within cryptocurrency markets as payment mechanisms. Their recent entry into non-crypto, real-world uses (e.g., to make payments to displaced persons) adds to the urgency of exploring how effectively digitally tokenized innovations like CBDCs and stablecoins might come to address the shortcomings visible with within the U.S. payments system.

This Chapter looks to the future to examine the potential of digitally tokenized money claims – CBDCs and stablecoins – to address current deficiencies in the U.S. payments system: (i) financial exclusion; (ii) inefficiencies in speed and cost; and (iii) an unwieldy cross-border U.S. dollar payments system. It suggests that, with proper regulation, these new innovations hold out potential for progress, highlighting use cases that can contribute to a more efficient and accessible U.S. dollar payments system. Importantly, stablecoins and CBDCs do not have to exist in a state of conflict – where CBDCs undermine the use cases for stablecoins, and vice versa. In describing these use cases, this Chapter sets the stage for considering specific ways in which regulation and policy might be adapted to make the most of the potential offered by these new technologies.

B. The Future of Central Bank Money

Central bank digital currencies are being widely considered as the next iteration of central bank money. In the United States, policymakers have signaled openness to the concept and studies are underway to determine how viable it might be. In other countries and regions, pilot projects are being launched to deliver digital bank notes into digital wallets. According to the Atlantic Council, 115 countries, representing 95% of global GDP, are actively exploring the possibility of introducing

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11 Desan, supra note [20], 2-20 (detailing various forms that money has taken historically and policy experimentation in the design of money). For example, Fedwire and its precursors, have transformed from the days when morse code would signal how much money to transfer between banks holding accounts at the Fed. Now, Fedwire represents a hyper-fast, digitized, and sophisticated service capable of handling trillions in payment volume daily. Board of Governors of the Federal Reserve, Fedwire Funds Service, supra note [77], 7-10 (detailing a history of FedWire and its technological transformations over the last century).


14 Out of the 81 central banks surveyed by the Bank of International Settlements in 2021, 90% reported ongoing exploration into CBDCs – and 62% pointed to live experiments, pilots, studies and concrete proofs-of-concept being put in place to move beyond the theory and toward real life. For example, the Bahamas launched the Sand Dollar in 2020, with Nigeria launching the e-Naira in 2021. The Eastern Caribbean, comprising eight member countries, has piloted D-Cash and China has been testing out a digital Yuan – the e-CNY. Anneke Kosse and Ilaria Mattei, Gaining Momentum – Results of the 2021 BIS Survey on Central Bank Digital Currencies, Bank of International Settlements Paper No. 125, 1 (May 2022).
a CBDC, with 60 countries already in an “advanced” phase of the process, having started development or undertaken either a pilot or an actual launch.\textsuperscript{217}

It is first helpful to identify the features that give CBDC conceptual firepower, distinguishing them from existing forms of central bank money and online banking.\textsuperscript{219} At its most basic, a CBDC is liability of a central bank in digitally-issued form.\textsuperscript{219} But, instead of just being an electronic book entry on the central bank’s balance sheet, a CBDC has the potential to also exist in the form of programmable computerized code. This gives CBDCs a much more flexible quality than simple entries in an online master account or physical cash. CBDCs can be made “smart” depending on the central bank’s policy preferences.\textsuperscript{220}

Crucially, because the central bank issues the money, a CBDC ranks as the safest form of money. In the United States, this means that the money would come free of any credit risk. It should also have no liquidity risk either – meaning that it can be used anywhere to pay. This makes a CBDC akin to Fed-backed banknotes. This feature contrasts with online commercial banking, that offers a private claim to the funds held at the bank. Because of this ultimate in safety, those holding a CBDC do not have to worry about ensuring that it is guaranteed by deposit insurance. The CBDC, like cash, comes protected by the fact that it is backed by the credit of the Federal Reserve.

But the CBDC also offers novel attributes that distinguish it from physical cash – adding choice for consumers within the economy. Perhaps most obvious is that its form is entirely digital. The CBDC must be hosted within a digital wallet. This shift in look and portability is important. For one, the CBDC captures the general trend away from physical cash that has gained traction in the wake of the COVID-19 pandemic.\textsuperscript{221} By turning the publicly-backed nature of physical cash into digital form, CBDCs tap into and respond to popular preferences.

CBDCs thus seek to reap the benefits of cashless payments in an instrument with the backing of the central bank. In a CBDC-enabled environment, shops and shoppers do not have to carry physical cash, but can transact using a digital CBDC. Customers are exposed to fewer physical risks and discomfort, such as having to pay in-person and finding an ATM to take-out money. For the state, digital cash use can diminish the influence of the informal economy that can otherwise incentivize


tax evasion.\footnote{Sarah Allen \textit{et al.}, \textit{supra} note [220], 62-63.} By reducing physical cash needs, while also creating an option to use CBDC as digital cash-equivalent, policy can reduce the downsides of physical cash while leveraging the gains of a central bank-backed liability being used as everyday money by everyday people.

Additionally, CBDCs can help shore-up financial stability by ensuring a mix of central bank-backed money claims and private money claims, rather than a skew in favor of excessively high digitally-issued private money claims circulating in the economy. In Sweden, for example, the shift away from physical cash has been so dramatic that it has compelled policymakers to accelerate exploration of their CBDC – the e-Krona.\footnote{Sveriges Riksbank, \textit{supra} note [218].} In a similar vein, the United Kingdom’s consultation paper into the digital pound expressly cites to the importance of maintaining public access to central bank money as a founding reason for exploring creation of its CBDC.\footnote{Bank of England, \textit{The Digital Pound: Technology Working Paper}, 14-15 (Feb. 2023).} With fail-safe central bank-backed physical cash being abandoned \textit{en masse} in favor of digitally accessible, private money claims, policymakers are finding that they might now need to find a way to restore greater balance between public and private money.

Importantly, the potential for programmability within CBDCs introduces a number of functionalities that physical cash or entries in a master account just cannot provide. Broadly, programmability refers to the capacity of the underlying code to include pre-set instructions that direct it to perform certain actions. Just as a smartphone is computationally programmable in ways that enable it to, say, only open when it receives its user’s thumb-print, or their facial outline, similarly, the CBDC’s code may be configured to perform certain actions based on particular pre-set instructions.

Because a CBDC is issued as code, it holds out the possibility that it might be programmed in a smart way to satisfy particular monetary and policy goals. This capability gives policymakers a uniquely powerful tool with which to execute particular goals with greater precision. For example, to mitigate the economic damage of COVID-19, national governments provided stimulus payments to people and businesses. By putting money into pockets, such measures were designed to encourage spending and prevent the collapse of Main Streets around the country.\footnote{See, \textit{e.g.}, Alicia Parlapiano, Deborah B. Solomon, Madeleine Ngo & Stacy Cowley, \textit{Where $5 Trillion in Pandemic Stimulus Money Went}, The New York Times (Mar. 11, 2022).} Within a world of programmable CBDCs, governments (and, by extension, the taxpayer) can exert some measure of greater control on how such stimulus money is spent. A stimulus-specific CBDC, for instance, might launch with a pre-set expiry date, meaning that funds would have to be spent within a certain period, otherwise the money could extinguish or erode in value.

Such tailoring can also help money get to where it needs to go, and avoid waste, fraud, theft, and other misappropriation.\footnote{Sarah Allen \textit{et al.}, \textit{supra} note [220], 64-65.} The U.S. COVID-19 stimulus program faced serious hurdles in getting money to people. Checks were sent out quickly. But around one million such payments – totaling

\footnotesize{\textsuperscript{220} Sarah Allen \textit{et al.}, \textit{supra} note [220], 62-63.  
\textsuperscript{221} Sveriges Riksbank, \textit{supra} note [218].  
\textsuperscript{224} Sarah Allen \textit{et al.}, \textit{supra} note [220], 64-65.}
over a billion dollars – mistakenly went to those who were deceased.\textsuperscript{227} Programmability could help policymakers potentially skirt such pitfalls. By automatically “canceling” CBDC payments sent in error, such functionality can help reduce waste, ease the logistics of distribution, and help to unlock the fullest economic potential of every dollar.

A comparison of CBDCs and physical cash, however, also reveals drawbacks – and raises critically important questions for how to design a CBDC. For example, the same physical banknote cannot be spent twice in exactly the same transaction. Once it has been transferred, it becomes the property of the payee – who now has ownership of the note. In contrast, programmable digital dollars might well end up vulnerable to defects within their programming that result in them becoming hacked or exposed to double-spending and theft.\textsuperscript{228} To be sure, cash can also be stolen or lost. But the CBDC comes with new operating risks that physical cash does not possess.

Design Choices and CBDC

These complexities raise questions for policymakers about how to design a CBDC in order to ensure that it is well-used and offers a real, safe, and popular choice to consumers as part of the basket of payment options available to them.\textsuperscript{229}

A few core questions stand out: (i) whether a CBDC should be account-based or token-based and what are the implications for private issuers of money; (ii) how might a CBDC protect financial stability, avoiding the chance that private money is crowded out by consumers migrating entirely into CBDCs?; (iii) what factors might help to incentivize uptake of a CBDC within currently financially underserved communities that might prefer physical cash or other non-bank options – especially in light of the emphasis on financial inclusion as a key goal of any CBDC?

Account-Based vs. Token Based CBDC

The foundational design choice facing policymakers is whether the CBDC ought to be account-based or token-based. These two concepts present distinctive pathways, with various implications for private issuers and distributors of money.

At its simplest, a “token-based” CBDC comes closest to physical bank notes. By being tokenized, a dollar of central bank money is digitally represented – on a payments card or in a digital wallet. A token is not allocated to a specific, named person. It is simply carried and spent, without necessarily registering who spent it, why and who acquired the value it represents. Avanti’s design features, for


\textsuperscript{228} Sarah Allen et al., supra note [220], 58-59.

\textsuperscript{229} Sommer, supra note [23], 15-17. For discussions of the political economy of CBDC, Christina Skinner, Central Bank Digital Currency as New Public Money, University of Pennsylvania Law Review (forthcoming) (noting the risk of CBDCs for expanding the powers of the State).
example, were that of a token-based CBDC. The Finnish Central Bank did not build a currency that encoded the identity of each owner and spend.\textsuperscript{230} Losing the token generally means losing the money. If the card is lost – or the wallet becomes inaccessible (\textit{e.g.}, a person forgets their password), the value may end up out of reach.\textsuperscript{231}

By contrast, an account-based CBDC reflects an allocation to an identifiable person and stored in a verified account. To spend or receive the CBDC, it is necessary to authenticate identity and entitlement to value. Credit cards, for example, represent an account-based entitlement. They require the holder to be authorized and to verify each transaction.\textsuperscript{232} An account-based CBDC allows for a fuller deployment of programmable sophistication. For example, in a world of programmable currency, CBDCs could be issued to a particular sector of the economy under a specific policy program (\textit{e.g.}, senior citizens being sent Social Security payments). Parents might put CBDCs in special accounts for children that are only spendable in prescribed ways. Because a particular CBDC is allocated to a specific account, the fact that the account is hacked, or the password is lost, becomes less devastating. The personalization means that a CBDC can be more impervious to threat as it readily encodes who is entitled to use it.\textsuperscript{233}

These broad distinctions, however, simplify what are a more complex set of choices. Both systems, for example, are unlikely to operate with the straight-forward paper-based anonymity that physical cash provides. Even within a token-based environment, requirements for identity verification and ownership will most likely still be necessary (\textit{e.g.}, to prevent liability for money laundering).\textsuperscript{234} While the distinction between account-based and token-based is overly simplistic, it does set up the basic poles of a design choice and embeds certain policy outcomes within it. For example, token-based CBDCs may provide for stronger privacy protections, where the token does not attach to a particular account and does not connect a person’s spending to a token-based wallet. In this way, these broad categories can help policymakers consider the policy trade-offs involved in creating a CBDC with features that seek to resemble those of physical cash (\textit{e.g.}, token-based), or one that aims to offer policymakers a wider range of functionality (\textit{e.g.}, through programmability).

\textbf{The Role of Private Issuers and Distributors}

The role of private actors in CBDC payment systems represents a critical consideration for policy. The possibility that the money claim can be digitally issued by the central bank – potentially directly to user-accounts – raises questions about the place of private actors like banks and non-banks within money intermediation.

\textsuperscript{230}Grym, supra note [205].
\textsuperscript{231}Raphael Auer & Rainer Böhme, \textit{The Technology of Retail Central Bank Digital Currency}, BIS Quarterly Review, 93-95 (Mar. 2020).
\textsuperscript{232}Auer & Böhme, supra note [231].
\textsuperscript{233}Auer & Böhme, supra note [231].
There are a number of options on the table. At one end, the CBDC could usher in a “public service” model whereby only a central bank issues CBDC and CBDC accounts to everyone. An approach that gives the central bank primary authority to issue CBDC could potentially solve the problem of underbanking with a flourish. In forwarding this public service model, the Fed would issue CBDC accounts to all-comers in an accessible and affordable way.

But this central bank only approach can also raise concerns about the health and diversity of the financial system. Understandably, it has the potential to negate core pillars governing private money intermediation, where the Fed becomes the main repository of CBDC-deposit funds and provider of related services (e.g., payments). Where banks and other money intermediaries lose access to a core customer base, many will fail to thrive. The financial system also becomes profoundly dependent on the capacity of the Fed to deliver. If it cannot do so or it suffers a failure of some sort (e.g., a cyber-attack), the resilience and viability of the monetary system can come under severe doubt. The Fed also becomes responsible for detecting and preventing everyday money laundering and financial crime at a granular, transaction-by-transaction level - taking it into new areas of intervention and daily supervision for a central bank.

A further risk lies in the Fed having to address the question of how it manages cross-border CBDC accounts. Given the preeminent role of the dollar internationally - policy would have to decide whether this means that the “everyone” includes, quite possibly, any number of persons globally, making the Fed a kind of banker to the world. Or, policymakers might determine that the CBDC-option is open only to those that reside within the United States to avoid issuing digital currency and related accounts to an open-ended number of people around the world. The central bank would presumably also have to construct and operate the wider enabling infrastructure for CBDC payments, such as the communication networks between merchants, customers, and the bank, alongside the basic record, noting the movement of money across CBDC accounts/tokens.

Finally, concerns might be raised about the heavy concentration of data and information within the central bank. Focusing vast quantities of data within a central bank may be inevitable where it has ultimate responsibility for maintaining the database for CBDC accounts/tokens. But where the central bank is the main player (rather than one where private actors are also engaged), it can become the monopolistic collector, distributor, and warehouse for vast quantities of payments-related information. This hyper-centralizing model can have its benefits. Notably, the Fed would sit atop a uniquely deep reserve of information that can be parsed for insights about the economy. But it also triggers profound sensitivities about situations where such information may be misused, lost,

235 Crawford, Menand & Ricks, supra note [29]; Omarova, supra note [29].
236 Crawford, Menand & Ricks, supra note [29]; Omarova, supra note [29].
237 Crawford, Menand & Ricks, supra note [29]; Omarova, supra note [29].
mishandled, or shared inappropriately. Worryingly, this unique treasure trove of data becomes highly attractive to cyber-criminals or rogue actors looking to disrupt the U.S. monetary system.\textsuperscript{240}

While there are benefits to a public-only model in CBDC issuance, policymakers have come out strongly in favor of a public-private partnership. The U.S. Treasury has described it as the more feasible and least disruptive approach. In its analysis, the Fed favors a privately intermediated model.\textsuperscript{241} For a start, deploying the central bank as the primary provider for money issuance, accounts, and payment services takes it far from its usual mandate. Recall that the Fed is authorized to provide accounts to depository and other select institutions. In addition, policymakers have underscored the strengths of the private sector in offering retail-facing services, innovating, marketing and integrating services with other products (\textit{e.g.}, credit cards, financial advisory, etc.).\textsuperscript{242}

Even within a public-private model, there are several options for policymakers.\textsuperscript{243} The first reflects a “digitally upgraded” version of the present-day monetary architecture where private payment firms issue “synthetic CBDCs.” Here the central bank would issue CBDC as central bank money. The CBDC lands in Fed master accounts. Private intermediaries like banks then issue a “synthetic CBDC” to everyday customers and provide accounts/CBDC-payment services.\textsuperscript{244} To signal that these balances are safe, private payments providers adhere to traditional safety and soundness principles and keep sufficient reserves of CBDC to backstop their promises to their customers.\textsuperscript{245}

Another way to conceptualize this is to see CBDC issuance and distribution along the lines of the established money pathways deployed within the economy today. For example, the Fed would issue digital dollars for public distribution through the commercial banking system. As with present-day banking, the customer gets a direct claim only against the commercial bank, not the central bank. Because a customer’s money claim is against their bank, this version of the world represents a form of “synthetic” CBDC. It recreates the money hierarchy, with private financial institutions issuing a slightly lesser version of original central bank-issued CBDC. This model is thus looks facially similar to the one seen within present-day commercial banking, where customers can only exercise a private contractual claim against their banks, and presumably also gain the benefit of deposit insurance. Understandably, because the customer’s direct claim is against a private entity, this version ultimately strains the definition of a CDBC.\textsuperscript{246} It also reduces one its major policy goals – to provide the public

\textsuperscript{240} Bank of England, \textit{supra} note [234], 24.
\textsuperscript{242} Bank of England, \textit{supra} note [234], 46-47.
\textsuperscript{244} Tobias Adrian & Tommaso Mancini-Griffoli, \textit{The Rise of Digital Money}; International Monetary Fund Fintech Notes 19/01, 12-13 (Jul. 2019).
\textsuperscript{245} It would be a matter of policy to determine whether synthetic CBDCs deposits might be subject to fractional reserve banking, whereby a bank is able to lend out a portion of the deposit.
with the strongest form of central money in their pockets to offset the risks of a financial system heavily dominated by private money claims.

Another, potentially contemporaneous, option tasks private intermediaries with distribution of central bank liabilities that remain directly enforceable against the central bank itself - not the intermediary. The CBDC is issued as a direct liability on the books of the central bank and is enforceable against the central bank itself throughout the claim’s life. In other words, the intervention of the private sector intermediary does not change the legal nature of the CBDC (it remains a liability against the central bank). In this context, federal deposit insurance becomes unnecessary as the money claim is directly backed by the central bank. Private distribution allows private payment firms to offer an account and services to customers, while ensuring the distribution of CBDCs as a distinctive category of public money separate from private deposits, physical cash, or commercial cards that might be offered as part of the payment choices available to users.

For example, the Bank of England’s consultation paper into the digital pound proposes the creation of a CBDC-platform that the Bank provides and manages, with a role for private actors in CBDC distribution. This platform is envisioned as a base ledger, reflecting CBDC that is issued by the central bank. As proposed by the paper, a further layer would then be built on top of the core foundation layer, and this top layer would then allow authorized private payment firms and service providers to connect to the ledger and use this access to provide accounts and services to everyday customers.\textsuperscript{247} Indeed, the Bank’s vision underlines the enormous commercial opportunities to be had by the private sector in partnering on future CBDC distribution with the Bank.\textsuperscript{248} While private firms are key players, the implication is that they remain conduits for central bank claims that are directly enforceable against the state, and not against participating private entities.

**Financial Sector Stability**

Such design choices go to the heart of financial system stability and ask whether this new CBDC-based monetary system will disrupt the delicate balance between the public and private sector.

It is easy to see why policymakers - and the private sector - are approaching CBDC carefully. By setting up central bank money potentially in competition with privately issued money claims, a successful CBDC could mean that consumers opt-into CBDC whenever they choose.\textsuperscript{249} This could drain private financial institutions of capital, and potentially do so during periods when these institutions can least afford it. For example, anticipating an economic crisis, people might rush into

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the banking system to convert their bank deposits to CBDCs. On paper, this would immediately give savers a claim against the Fed, putting them on the safest footing. In practice, though, it would simply substitute an indirect public claim for a direct one – that is, by eliminating a claim supported by federal depository insurance in favor of a CBDC. Deposit insurance should provide protection and comfort for customers. But in a world of imperfect information, panic, and the choice of a CBDC readily available, it may be rational for people to seek out the safest alternative. Where deposits are uninsured (because they exceed the $250,000), bank customers may be especially motivated to convert their private money claims to CBDC. Unfortunately, for the banking and private intermediation sector, this dynamic sets the stage for a classic run - when the drain on capital from the private sector is sudden and severe. Ultimately, the potential for this kind of competition between public and private claims means that private intermediaries might always be on the backfoot, worried about being able to match the power of a U.S.-backed claim.

With these stakes, the emergence of a CBDC introduces the need to consider some novel adjustments that could sharply change some current practices in banking and monetary policy design (described in Chapter 1). For example, a bank customer today can immediately transform their private claim against a bank into a public claim against the Fed by the simple act of visiting an ATM. By getting cash out of the machine, the person’s liability to their bank decreases, while their claim against the Fed increases. In addition, this reflects the fact that reserves and private bank money are designed to be interoperable, allowing a bank (if it needs to) to alter the composition of its reserves at the central bank to pay out on its own liabilities. Such elasticity might require some rethinking in the context of a CBDC, for example, to offset risks where customers can be strategic about and freely choose between private and public in any given situation, potentially exposing the larger system to instability and unpredictability.

**Making the CBDC Attractive and Usable**

A key challenge for policymakers contemplating the creation of a CBDC lies in working out ways to ensure that it is actually used in practice. The CBDC needs to build network effects in order to make it attractive. The thicker the networks, the more the CBDC becomes a part of everyday life and the better the chances that policy can exploit greater choice in payments most optimally.

First, the creation of a CBDC depends on the ability of the public to use it easily. A steep technical learning curve, difficulty validating transactions, or accessing accounts will mean that cognitive and logistical costs disrupt how quickly and easily CBDCs can be accepted as money. To the extent that the CBDC is entering a market of already established payment methods – and seeking to solve for failures in the system – it has to make a case for its use by enriching the user experience in terms of convenience, utility, financial cost, security, and social practices. Clearly, users can shift behavior and

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250 Kumhof & Noone, supra note [249], 5-6; Chen & Phelan, supra note [249]. This form of risk is already endemic within the traditional banking system, as depositors try to get their money out of a failing bank.

251 Cheng & Torregrossa, supra note [19].
rapidly opt-into new networks. As the success of Pix, UPI, and P2P payment systems highlight, for example, consumers can drastically change their habits and adopt new ways of engaging with the age-old act of payment. A range of factors will have to be considered to deepen a CBDC’s usability. For example, the digital interface through which the CBDC is accessed is important. In addition, the costs to users will also likely make or break the CBDC. For Pix, Faster Payments, or UPI, retail transactions are free, even though the central banks and payment services providers are paying a cost to provide the service. Avant’s example showed that attaching an upfront cost to obtaining CBDC, however small, resulted in a fatal cost to the viability of the mechanism. Critically, the role played by payment services providers will likely shape the user experience and prime their incentives to use CBDC and CBDC services. This suggests the need for policymakers to consider creating incentives for private intermediaries to engage with the CBDC system as way to promote its viability, rather than to undermine it in favor of private money creation.

Secondly, CBDC might face resistance in areas where its need is greatest. With millions unbanked or underbanked, CBDCs hope to offer various solutions to promote inclusion. But policymakers must ensure that communities outside of or on the periphery of the banking and financial system are convinced to enter it through CBDC. Recall that some communities prefer using physical cash. As shown in the study on remittances made by U.S. migrant communities, cash was considered to be attractive by many – for example, where employment income was itself paid in cash.\footnote{Martin \textit{et al.}, supra note [100].} Technical or documentary hurdles might discourage uptake, alongside concerns among vulnerable communities about being heavily surveilled.\footnote{See, e.g., Nicol Turner Lee & Caitlin Chin, \textit{Police Surveillance and Facial Recognition: Why data Privacy is Imperative for Communities of Color}, Brookings (Apr. 12, 2022), https://www.brookings.edu/research/police-surveillance-and-facial-recognition-why-data-privacy-is-imperative-for-communities-of-color/.} A small, less developed CBDC user base might limit its network benefits and usability. Where CBDC does not connect with the banked and underbanked, and cannot generate network effects, it loses a key policy ground driving its appeal.

These considerations speak to deeper questions surrounding the governance of the CBDC. Ensuring that the CBDC is designed to offer its users protections from state surveillance of their payment habits, robust storage of sensitive data, and the ability to trust the resilience of the technology constitute just some of the multiplicity of factors impacting how much faith the CBDC will carry. Where the state cannot be trusted to respect the rights of users within their payments data, or if the code is vulnerable to frequent failure, digital currencies may well lose in the face of physical cash or even bank-issued claims with which users are familiar.\footnote{For discussion of increased state power in the context of CBDC, see Skinner, supra note [229]; J. Chris Giancarlo & Tim Harper, \textit{The Values of Money: Will Tyranny or Freedom Be In Your Digital Wallet}, American Enterprise Institute (Feb. 2023).}

C. Stablecoins as Private Money Solutions

Stablecoins have assumed center stage within the crypto-economy as an anchoring asset designed to facilitate an array of trading and investment activities. Stablecoins offer a 1:1 peg and are issued to
be flexibly exchangeable between parties. They also purport to function as payment systems that can move value rapidly. In general, stablecoins are designed to directly settle on international non-bank payment rails, most notably, public blockchains (e.g., Ethereum). Stablecoins have grown in prominence as an asset class capable of enabling rapid transfers of value. As of February 2023, stablecoin market capitalization stood at $136 billion, with the three largest stablecoins, TetherUSD (USDT), USDCoin (USDC), and BinanceUSD (BUSD) valued at $70.4 billion, $41.4 billion and $13.3 billion respectively.

The originating idea behind stablecoins is straightforward. Within a universe of volatile, hard-to-value cryptocurrency assets, stablecoins are designed to offer an option whose value is steady and predictable, where one stablecoin is consistently equivalent to a known, credible, real-world currency – usually, the U.S. dollar. Someone looking to buy a stablecoin can generally hand over a dollar and get one stablecoin in return.

The methods by which stablecoins generate their perception of safety varies. Issuers of stablecoins have tended to follow two main pathways to support the claim that their coin is stable. By far the most credible lies in promising that stablecoins are backed by reserves of very high-quality liquid assets. Coins are minted with the assurance that the issuer has enough top-quality assets on hand that can be sold to maintain the peg. Because these assets might need to be sold quickly and must be able to generate a predictable price, they need to be inherently tradable (or liquid). The range of assets that can meet these criteria is understandably very small. It includes the likes of cash or highest quality government debt (e.g., U.S. Treasuries). As soon as a would-be holder deposits their dollar and is given a stablecoin in return, the issuer promises to keep that dollar, or one dollar’s worth of a U.S. Treasury, safely in its vaults. In August 2022, stablecoin issuers held around $80 billion in short-dated U.S. Treasury securities, or around 2% of Treasury bills. While some stablecoin issuers commit to holding their reserves uniquely in the form of cash or U.S. Treasuries, others are willing to include greater risk – to incorporate highly-rated corporate debt, for instance, municipal debt securities or other kinds of cryptocurrencies and stablecoins.

Another model – now much maligned – lies in using algorithmically-based pegs to support stablecoins. In a purely algorithmic stablecoin, there are no hard assets (e.g., cash/Treasuries)

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257 Some stablecoins might seek to be pegged to currencies like the euro or other cryptocurrencies. President’s Working Group on Financial Markets, the Federal Deposit Insurance Corporation and the Office of the Comptroller of the Currency, Report on Stablecoins, 4 (Nov. 2021).
258 The definition of liquidity has attracted vast research in finance and economics. This description necessarily simplifies but seeks to convey the basic attributes. For a summary, Katie Kolchin, Why Market Structure and Liquidity Matter, SHMA Insights (Sept. 2021).
259 Scott Chipolina, supra note [256].
backing the coin. Rather, the peg is maintained using mathematical processes that constantly adjust the supply of the coin to match demand and keep the coin’s price pegged to a dollar. For example, if the price of the stablecoin dips to $0.98, then its governing protocol “burns” a certain amount of the available supply, and helps the price to climb back up to $1.00. The logic behind this model of stablecoin lies in establishing a decentralized process to govern the coin, rather than leave the viability of the coin in the hands of one actor, the issuer. To be sure, asset-backed stablecoins can use algorithms to monitor that each claim is backed by a sufficient amount and quality of assets, triggering purchases where the value of existing assets fall below what is needed to the base of outstanding claims. But, in an “algorithmic“ stablecoin, the universe of the stablecoin is underpinned by the quality of the algorithm - and not hard assets.

While possessing mathematical elegance, algorithmic stablecoins lost their luster following the dramatic collapse of the TerraUSD/Luna stablecoin ecosystem in May 2022. Once totaling almost $18 billion in issuance, TerraUSD fell into a “death spiral” as the algorithm failed to maintain the peg under heavy selling pressure, causing the value of the Terra/Luna coin system to crash in a matter of days. Sending shockwaves across the crypto-community, forced to confront the complete failure of an apparently failsafe coin, the notion of a purely mathematically governed stablecoin now attracts near fatal levels of skepticism. The U.S. House of Representatives Financial Services Committee, for example, has proposed legislation that seeks to provisionally ban new algorithmic stablecoins for two years, requiring such “endogenously collateralized” stablecoins to be subjected to further study.

Stablecoins represent a private, tokenized, contractually created claim that comes with a basic feature - the 1:1 currency peg. Their more detailed terms, however, can vary depending on the issuer, its governance, policy in relation to the composition of reserve assets and redemption rights. This gives users choice. It also requires that holders check the offering terms in determining which coins are best suited to their risk expectations and economic need. Terms can vary widely. For example, redemption conditions differ by issuer. In some cases, delays are imposed, with holders forced to wait days before they can convert the stablecoin into cash. There may also be a fee or other cost to redemption. Checks may be needed before money is returned, creating a delay, even if the terms

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263 The algorithmic model can also incorporates some hybridity. Instead of relying solely on the algorithm to support the price-peg, an issuer might also keep some high-quality assets in reserve accounts. These can offer a partial backstop if the algorithm ends up malfunctioning or losing the ability to maintain the peg.

Electronic copy available at: https://ssrn.com/abstract=4425922
do not specifically have a requisite waiting period. These frictions prevent stablecoins from operating like on-demand deposits in practice: they do not always allow conversion value into U.S. dollars whenever a holder wants it.

Stablecoins have expanded into the business of payments owing to a number of appealing features. Importantly, they do not rely on traditional payment rails for their internal clearing and settlement, potentially enabling speed and throughput, and decreasing cost. Stablecoin networks move value by exchanging tokens between users (e.g., using blockchain-based verifications and transfer). As digital representations of value, these assets can be transferred between payer and payee quickly - and generally without logistical worries about the need to engage correspondent banks or to only expect settlement during normal business hours. For example, in an analysis of popular blockchain protocols for stablecoins, PayPal found that network transaction fees could be as low as 1/100th of a cent (in U.S. dollars), with supported throughput in the thousands of transactions per second. Circle, a stablecoin issuer, found stablecoin transaction fees on common blockchains ranged from 50 cents to less than a cent for close-to-real-time transactions. Compared to existing real-time payments infrastructure, like The Clearing House RTP scheme as described in Chapter 1, blockchain-based payment infrastructure has the capacity to reduce fees from two U.S. dollars to less than 50 cents with transactions averaging under 180 seconds. So long as both sides to the transaction can access and use the stablecoin network, they can take advantage of tokenization and digital settlement on fast, cross-border rails as a way to resolve the usual frictions involved in both domestic and international payments. Users do not also need to have a bank account - just an account (wallet) on the stablecoin network.

Stablecoin issuers are increasing engagement within contexts that extend beyond the conventional crypto-ecosystem. For example, they are promoting their networks as capable of facilitating real-world payments like direct deposits, offering services that might enable businesses to switch to making payroll using stablecoins (rather than slower ACH networks). Innovations are emerging to assist in mimicking direct deposit type-payments for businesses, connecting users to accounts on crypto-exchanges that can receive stablecoin payments and then allow users to convert the token to cash. In addition, stablecoins are expanding into the world of computer games and the metaverse. Rather than require users to opt-in to the specific native coin of a particular

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Gorton & Zhang, supra note [255], 47-53 (detailing the economic characteristics (e.g., debt vs. equity) as well as redemption conditions governing different stablecoins).

Gorton & Zhang, supra note [255], 3-8 (discussing the nature of stablecoins and whether they might be regarded a form of deposit).

Certainly, national laws may apply to check for money laundering, terrorist financing, etc. Further, providing redemptions into cash is typically dependent on functioning banking relationships. In the United States, crypto-companies, including stablecoin issuer relied on Signature Bank’s 24/7 payment settlement network – Signet – to ensure conversion into fiat money. When Signature collapsed in March 2023, Signet’s functioning came under severe stress and uncertainty about its operations, delaying redemptions. See, e.g., Danny Nelson, Circle Scrambles to Right USDC After Signature Bank Failure, CoinDesk (Mar. 12, 2023), https://www.coindesk.com/policy/2023/03/12/circle-scrambles-to-right-usdc-after-signature-bank-failure/.


Two major risks are worth highlighting. First, the stablecoin structure is vulnerable to the risk of a run if it is not properly structured and regulated. A loss of faith in its ability to backstop its promises means that stablecoin holders might seek a panicked exit. A surge of redemptions can put a strain on the reserves backing the coin. If these reserves are insufficient, or if their value falls, the stablecoin can break the peg, intensifying the negative spiral. As shown by TerraUSD/Luna, such dangers can play out rapidly. The crypto-currency system suffered a second shock after TerraUSD/Luna’s failure when Tether, too, briefly lost its peg.\footnote{But note, Gordon Liao, \textit{Macroprudential Considerations for Tokenized Cash}, Working Paper (Sept. 23, 2022) (highlighting the practice of tokenized cash-based stablecoins maintaining very high reserves of high quality liquid assets); Gordon Liao & John Carmichael, \textit{Stablecoins: Growth Potential and Impact on Banking}, Board of Governors of the Federal Reserve Discussion Paper Number 1354 (Jan. 2022) (noting that asset-backed stablecoins can be helpful during crisis, with observations suggesting that their price against the peg rises under stress).} When Circle, the issuer of USDC, revealed that it maintained $3.3 billion in reserve holdings with the failing Silicon Valley Bank in March 2023, panicked selling caused its peg to temporarily fall to $0.87.\footnote{Vicky Ge Huang, Hannah Miao & Caitlin Ostroff, \textit{Circle’s USDC Stablecoin Breaks Peg With $3.3 Billion Stuck at Silicon Valley Bank}, The Wall Street Journal (Mar. 11, 2023).}

Secondly, the (current) lack of standardized information about issuers and reserves can contribute to uncertainty and panic. It can turn assets normally viewed as informationally insensitive into ones where information is considered necessary to restore trust and confidence to the coin. Unlike the banking system, where a crisis might trigger federal assistance to protect asset values, no such support formally exists for stablecoins. Where ecosystems are dependent on stablecoin-based payment and settlement services, the failure of a key rail can trigger systemic consequences capable of causing far-reaching economic damage.

\section*{D. CBDC and Stablecoins in a New Payments System}

\textit{Possible Use Cases and for Stablecoins and CBDC}

This section explores scenarios where CBDCs and stablecoins may be used in practical ways, both separately as well as complementarily. Importantly, the aim here is not to promote innovation purely for the sake of novelty but, rather, to outline some actionable solutions for addressing structural economic and social deficits within payments infrastructure.
The discussions below are organized around the following themes: (i) crafting new payment rails using stablecoins and CBDCs; (ii) improving financial inclusion; (iii) enhancing speed and efficiency; and (iv) developing a stronger U.S. dollar international payments system.

Use Cases: Stablecoins

Enabling New Digital Economies

Stablecoins can help provide standardized, safe, and reliable payment mechanisms within emerging digital economies. They offer a pathway to facilitate the creation of a secure and fast payment rail that is adaptable to the digital economy’s various environments. Current iterations of major stablecoins have shown themselves capable of being transferred across borders rapidly on blockchains or through cryptocurrency exchanges. By choosing to accept stablecoins, payments can be made without the user having to handle multiple currencies and the fees that standard foreign exchange transactions typically attract.

This use case can be exemplified by video games. Many games are presently home to thriving internal marketplaces, allowing the purchase of in-game experiences, merchandise, avatars, and status-enhancing features on characters and skills. So-called loot-boxes proliferate within gaming as assets for purchase – these boxes generally do not reveal what is in them (e.g., particular avatars, weapons, cheat codes) until they have been bought. While a player’s winnings are virtual, the in-game market typically use real-world payment methods (e.g., credit, debit cards) and open to accepting payments in multiple currencies. Far from being an esoteric corner of the internet, successful games come with subscriber bases running into the millions and played across multiple platforms. Their marketplaces are also complex. The prospect of acquiring coveted loot, for example, has spawned illicit dark markets, that facilitate the purchase of such virtual goods.

More recently, virtual games have adapted to cryptocurrency platforms to create economies run on popular blockchains such as Ethereum or Solana. Players are able to build and own their creations (e.g., avatars) and to earn rewards in cryptocurrencies for developing unique and monetizable innovations in the game. This play-to-earn model has enjoyed explosive growth, with third parties as well as players incentivized to grow virtual universes with the promise of lucrative rewards. Crypto-governed games can include their own native currency or coin that is minted by the game itself and allocated to those that contribute to its operations and governance.

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274 Sheldon Evans, Pandora’s Loot Box, 90 George Washington Law Review 376 (2022) (noting the potential for loot boxes to represent a form of gambling).
The concept of virtual universes is gaining further traction with the advent of the metaverse, promising a much fuller and comprehensive online experience, one designed to replicate (and possibly enhance) real-world experiences through an immersive digital medium. Using virtual reality head-sets, rich graphics, and sound, the metaverse can offer environments approximating any number of experiences, such as live music, film, travel, and education. While the concept remains in its infancy, its ambition is revealed in eye-catching valuations projecting the worth of the metaverse as reaching $800 billion by 2024, with the potential to inject around three trillion into the global economy.277

The rise of a highly monetizable digital gaming economy, a trend that will likely intensify with the metaverse, places heavy demands on the existing payments system. The need to incorporate an efficient and secure payment system into this economy poses a suite of challenges. For one, the gaming market is international. Players are located in different countries and paying using a range of currencies. In addition, its architecture remains under construction - and so does an understanding of how to regulate it.278 While large online games have incorporated payment methods like credit cards into their systems, cryptocurrency-based as well as the new metaverse-driven virtual universes still require thinking around how payments interact with concepts of creation, ownership and investment. For example, with gamers sometimes also building parts of internal universe - like crafting characters and storylines - payments take on particular importance as a way of compensating creators for their intellectual contributions. Thirdly, the combination of large groups of people with their sensitive payments data in one place, lucrative rewards, and underdeveloped regulation makes for a risky combination. It is not surprising that gaming communities have become vulnerable to hacks, identify theft, financial predation, and fraud.279

Using stablecoins, a player could send money in stablecoins to the wallet of the gaming company. Should the player continue to want to make payments or earn rewards, they could maintain the stablecoin balance in their wallet. Those looking to cash-out could seek to sell coins on an exchange or redeem it. Because certain stablecoins are not proprietary to a particular game or platform, they may be used across multiple different games and platforms, potentially allowing stablecoins earned in one game to be used in other. The opportunity for interoperability can be useful for gamers or participants in a multiverse to avoid having to individually open multiple different accounts wherever they wish to play. This enables the faster stablecoin payment rail to create interoperability within gaming and overcome frictions entailed in traditional payment systems where money flows can be hampered by costs involved in currency conversions, settlement times, and the fees involved in making wire transfers or card payments.

278 See, e.g., Evans, supra note [274].
Importantly, stablecoins can help in addressing some of the challenges presented by gaming and the metaverse using international payment mechanisms. In a credit card payment, for example, a person in London (U.K.) paying in British pounds for a U.S. dollar-denominated loot box on a U.S. game may cause the credit card company to charge foreign exchange fees for the transaction. Should the player get a reward from the loot box – say, a $5 coupon – they will see that reward eroded by foreign transaction fees. A stablecoin based system, however, can avoid such repeated costs. The player might register for a stablecoin wallet and convert 100 GBP into USD stablecoins. This initial interaction will require foreign exchange and the attendant costs. But afterward, stablecoins would be available for the user to deploy throughout the gaming universe. Only once the player decides to cash out again would they have to worry about foreign exchange and resulting charges. In this way, the stablecoin has an advantage over credit cards, bank transfers, checks, or national real-time payment schemes that are geographically limited. Importantly, the money can generally flow rapidly, settling in seconds or minutes, rather than days.

**Business-to-Business (B2B) Payments**

Stablecoins and their settlement networks could add efficiencies to B2B payments. Making fast and cheap B2B payments represents an aspirational economic goal, with businesses currently contending with delays and inefficiencies involved in making payments using traditional settlement rails. These difficulties multiply where firms have to send payments internationally, where days-long delays and the high cost of wire transfers result in unavoidable but corrosive expenses.

Ensuring that companies can allocate capital rapidly across subsidiaries, send prompt, just-in-time payment to suppliers in response to invoicing, dispatch or receive investment funds (and so on), speak to dynamics that can help squeeze efficiencies from the time value of the dollar. Within volatile macroeconomic environments, delays of single business days or longer can cost businesses money in lost interest income as well as the potential need to find bridge financing or having to retain ample reserves of working capital. Particularly for large, complex organizations, such “liquidity management” can result in operationally intensive processes, where navigating around frictions in the payment system requires logistical expertise.

Using stablecoins and their settlement rails offers one pathway to a solution. B2B payments can look to use the speed, international coverage, and potential programmability of stablecoins to create a lower-cost, faster, and more reliable payments environment. Instead of sending money using wire transfers, a business making payment can instead buy stablecoins and use these to make a payment to its counterparty. Where both parties have wallets on a shared stablecoin network, payments could look to settle within minutes. The party being paid can cash out by redeeming the stablecoins for U.S. dollars (or another currency) at a time of its choosing.

The capacity to make payments quickly and reliably can offer businesses a number of advantages. Perhaps most significant is that payments can settle quickly. Money does not need to be sent three
or four business days in advance in order to meet the deadline. The payor business can instead use the money that it would have had to set aside across these multiple days. Faster speed and lower costs can reduce instances of late fees, which can arise where payors try to wait until the last minute to send payments. Indeed, automation attaching to stablecoins can further ease concerns about late fees or insufficient funds. Invoicing specialists might seek to build products on stablecoin payment rails by offering services where, as soon as a bill is due, payments can automatically be sent from one stablecoin wallet to another. Businesses may be alerted of an upcoming deadline days before the payment is due, for example, in case the stablecoin wallet needs to be replenished.

These facilities seek to achieve a basic aim: to make it easier, faster, and cheaper for businesses to manage their financing, to pay or borrow only exactly when they need (e.g., if they do not have sufficient funds), and to lower their overall operating costs as a result. More broadly, firms may end up taking on lower levels of risk. Critical business processes – such as delivery of a good – can occur with lower less risk being borne by one or other party because the payment can occur as close to simultaneously as possible with the transfer of the good from the seller to the buyer. Large corporate groups can transfer funds between related entities in a more timely way. This can be especially useful for financial institutions that need to deploy large volumes of cash quickly to fund positions taken in the marketplace or to direct cash quickly to a business line that needs it rapidly.

**International US Dollar Payments**

Similarly, stablecoins can achieve gains in efficiencies for cross-border payments systems. As set out in Chapter 1, international payment systems are a persistent sticking point in cross-border finance. Within the U.S. dollar driven global economy, the ongoing failure to build a fast, cheap, and comprehensive network to move USD-denominated payments presents a competitive risk, eroding U.S. economic power, or at least not adding to it in ways that might draw users into the U.S. dollar system. At the same time, this structural paralysis is not unique to the U.S. dollar payment system. Crossing borders means cost. It forces banks to leverage their global networks of correspondents, maintain accounts in faraway banking institutions, contend with business hours in different time zones, harness international messaging services and, sometimes, adapt their own data and communication conventions to fit with those in different countries.

There are two broad layers to consider. One, at the level of the financial system moving the money, is the question of how to do this better. Creating a viable cross-border U.S. dollar money transmission network requires a number of components and, at the very least, mechanisms that: (i) enable universally intelligible messaging about the funds and where the funds are going; (ii) allow funds to move from one payment institution to another across borders fast, cheaply, and securely; and (iii) reflect regulatory agreement between countries that standardize how payment institutions
assure that the money is not used for nefarious purposes like laundering illicit funds or financing criminal/sanctioned/terrorist entities.\textsuperscript{280}

Two, at the ground level, individuals and businesses need to receive money. They also need to be able to cash it into the physical or digital money they can use in their lives. Getting this money to them in ways that they can use – that is, for the money to travel “the last mile” – requires working out solutions that can both transmit the money to the customer and allow the recipient an accessible means to cash it out and/or spend it.

At the first level of financial markets, stablecoin networks could offer payment rails to send and settle cross-border U.S. dollar payments.\textsuperscript{281} That is, financial institutions would develop an international system of deploying tokenized cash to reflect the transfer of money claims. This new system would mark a change from current practice in important ways. For a start, it would shift away from bank-centric payment rails in international money transfer systems. A system of transfer by tokenized cash would look to stablecoin issuers to anchor new payment rails. In the present-day model, issuers do not have to be regulated as banking institutions. If this practice remains, international money transmission would bring non-banks much more fundamentally into the market as infrastructure providers for international payments, expanding beyond remittances.

By using stablecoins, verification of messaging and data and transmission of tokens from one wallet to another would likely require reliance on blockchains. This blockchain-based infrastructure will need to be viewed as reliable and failure-resistant to draw in financial institutions as users. At the same time, some aspects of the current landscape do not need to change radically. International money transfers will still be harder than domestic ones, meaning that transferring money across borders will continue to require expertise in intermediation. Ensuring that national money transmission laws are complied with, checking that money is clean, and ensuring that those receiving money in faraway locations have the ability to access it, likely still focuses intermediation into the hands of well-resourced and network financial institutions capable of leveraging compliance experience, local financial knowledge and large customer bases. Further, if international payments can become more efficient, leading payment providers are well positioned to provide add-on services on stablecoin payment rails, owing to deeper experience in international money movement and the capacity to scale rapidly to meet customer needs.

Using stablecoin networks for international payments raises the obvious issue: why not just let customers use the stablecoin network to send payments directly between one another? Why involve intermediaries at all? That capacity certainly exists and stablecoins are routinely used presently to

\textsuperscript{280} Efforts are underway for common data standards – notably, the ISO20022 messaging standards – to be adopted across financial institutions and supersede local conventions. JP Morgan, \textit{ISO 20022 Migration: Delivering Faster Payments Automation}, \url{https://www.jpmorgan.com/solutions/treasury-payments/insights/what-is-iso-20022}.

send value between single entities for a variety of purposes. But it is not a universal solution and intermediation in international money transfers is likely to survive. First, people may not want to send and receive all money in stablecoins. They may not be facile with the technology. Or they will simply prefer other methods of payment like cash that do not require conversion from a token. In addition, intermediaries help ensure that compliance with rules like those governing anti-money laundering, sanctions, and know-your-customer checks. This creates incentives for policymakers to create mechanisms necessitating some intermediation even where direct customer-to-customer tools exist. Finally, intermediation can be safer for reasons of consumer protection. If customers are sending money to one another directly, and something goes wrong, there is generally only limited recourse. In contrast, using intermediaries can offer protection, as well as a source of accountability and expertise when sending funds into jurisdictions other than one’s own.

New tokenized payment rails between institutions do not address the critical level-two issue: how do digital payments cross the last mile, ensuring that the money received can be widely spent? The first problem is that a stablecoin payment may arrive in a currency like the U.S. dollar that is not the recipient’s home currency. It may not be widely accepted as domestic legal tender – meaning that merchants and others will not accept payment in stablecoin. In addition, a recipient may prefer cash in hand, rather than use a digitally tokenized payment.

Tokenized transfers of money can create new versions of the last mile problem. If a recipient’s intermediary (e.g., a money remitter) receives stablecoins, it may charge the customer extra fees to convert the asset into physical cash. Conversion may need the remitter to send money to a local account using domestic payment rails. Or the recipient may have to show up in person and collect their cash. If the recipient elects to receive their money in actual stablecoins (because they have a stablecoin wallet), they still need to be able to spend it, requiring merchants and others to be willing to accept tokens, or to convert these tokens into cash.

There are no easy fixes but there are encouraging developments. Faster payment schemes around the world (e.g., Brazil, India, Thailand) have drawn in many who were previously unbanked or underbanked. A number of such schemes (e.g., Faster Payments, Pix) include non-bank providers of payment services as a way to broaden coverage. Rather than require the last mile to be solved through a bank account, in other words, it may be addressed by sending stablecoins and dollars to an account that connects to a broadly inclusive national payments scheme.

On another positive note, mobile phone ownership has been increasing around the world. Globally, in 2022, it was estimated that there 6.6 billion smartphone users, an increase of 78% from six years ago in 2016 (3.7 billion users). In the United States, cell phone ownership has grown to cover 97% of the population, with 8.5% reporting owning a smart phone and 7.5% of Americans own some other

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device like a laptop. Internet usage has also steadily increased, with around 93% of all Americans regularly online. These numbers do not convey the fuller picture. Trends vary depending on demographics. For example, in 2021, 86% of those earning $30,000 or less were online, compared to almost 100% of those making more than $75,000. Recalling that those from lower income backgrounds were also more likely to be underbanked, these figures underscore the difficulty of solving the last mile. However, the trendline points in the direction of a steady rise in people acquiring tools that can help them become more connected and able to transact using mobile phones and digital access to receive and use their money.

Finally, a CBDC can also help solve the problems of the last mile. If CBDC wallets become widely and cheaply available, they may allow digital money transfers into these accounts through a variety of inputs, including stablecoins. Importantly, CBDCs represent the most money of money. They unlock the capacity of money to be spent across the economy as legal tender (unlike stablecoins that may need to be converted into dollars and not always be accepted across the board). Again, the solution is not a perfect one. Problems remain. The CBDC-wallet will likely need to have capacity to work offline as well as online – to enable maximum functionality. Some countries may not be able to have their own CBDC, or their CDBC may not inspire faith owing to a lack of public confidence in the nation’s monetary institutions. Finally, as highlighted throughout this report, payments implicate sociological factors: habits, community norms, and private beliefs that reflect a particular relationship between a person and their money. Whether these shift in response to new technologies is a question the answer to which may not be known until we try.

Use Cases: CBDCs

Increasing Financial Inclusion

CBDCs have attracted enthusiasm from policymakers on account of their potential to contribute to increased financial inclusion. CBDC pilot projects expressly cite to aims of learning about this technology’s capacity to bring more people into the financial system. The launch of the “Sand Dollar” in the Bahamas, for example, notes as core objective the desire to improve inclusion and to add efficiencies to the state’s ability to provide government services. The scheme allows anyone to open a Bahamian CBDC account irrespective of age, nationality, or immigration status. The Bahamanian CBDC mobile app can be funded up to $500 without identification. Explorations of

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A potential U.S. dollar CBDC underscores the goal of spurring greater economic participation as a major motivating factor for adoption.289

A retail CBDC is unlikely to act as a panacea to the historic ills that have given rise to systematic inequalities and inequities in access to financial services. But it is worth exploring whether it might provide a foundation from which to enable lower-cost entry into the economy and subsequent use of a range of financial services and products. Three mechanisms might be beneficial in this regard.

First, because the CBDC is state-issued money and therefore backed by the full faith and credit of the government, it does not require that accounts holding it be subject to federal insurance, or that worries ought to exist about private money issuers posing credit risk vis-à-vis their consumers.290 Because CBDC is issued with the full backing of the government, policymakers have greater room to consider how they might distribute it and via whom. Banks represent the obvious go-to institutions with expertise, networks, and a host of regulatory advantages. But they have also suffered from gaps in coverage. Notably, those needing to benefit from financial inclusion also include many that are unbanked or underbanked. Certain areas represent deserts where banking services have long been lacking. Worries about trust and confidence in banks could limit uptake.

This raises the question whether non-banks might be permitted to offer “deposit” accounts solely for CBDCs and to provide services in relation to these digital dollars. Growing smartphone use, as well as accompanying digital savvy, open up options for policymakers to consider. For example, a Pew Survey revealed that six out of ten unbanked people in the United States owned a smartphone. Those owning a smartphone were more likely to be younger.291 These trends hold out the possibility for policymakers to enable CBDC wallets to be offered by non-banks using smartphones, reaching those that may not be included within the banking system. Banks, too, may harness such technologies to attract new customers by offering digital CBDC wallets – though online banking apps already offer many banked customers access to their bank accounts.

The negligible default risk attaching to CBDCs, alongside the potential greater coverage enabled by variety of non-bank actors, thus raises intriguing possibilities. It can leverage the relative strengths of different types of payment services provider. For example, brick-and-mortar money transmitters have cultivated strong networks among migrant communities. Other providers have developed familiarity and loyalty among those sending money digitally. Millennials, notably, have gravitated


290 This is the case for CBDCs that are not issued as “synthetic” CBDCs.

291 Pew Charitable Trust, What Do Consumers Without Bank Accounts Think About Mobile Payments? (2016), https://www.pewtrusts.org/~/media/assets/2016/06/fsp_what_do_consumers_without_bank_accounts_think_about_mobile_payments.pdf. The study also notes that unbanked smartphone holders were twice as likely as banked users to cancel or suspend their cellphone plans owing to the cost of maintaining a plan.
toward P2P payment apps. Using a wide range of non-bank participants for distribution allows policymakers to make the most of their networks, marketing expertise, name-brand recognition as well as different business models to draw in those people that have not historically been won over by more traditional banking and financial services firms.

**Accessible CBDC-Based Payment Systems**

With low/no cost CBDC accounts being provided through a range of payment services firm, policymakers are well positioned to promote inclusion by creating a fast and reliable retail P2P CBDC payments rail. Such a system could build its network effects by encouraging payment services providers to offer wallets connecting to a CBDC-based payment and settlement scheme. In turn, popularity can make the scheme attractive to innovators that tailor new functionalities to run on CBDC-scheme infrastructure.

Such a system comes with several advantages. For a start, the CBDC based payments-system offers execution in central-bank money. As noted above, this can permit a range of payment service providers as distributors to bring new customers into the scheme. It also reduces credit risks within the scheme because the CBDC claim is unaffected by the failure of a private entity. There can be utmost confidence in the fact of settlement. In addition, by including large groups of users, the scheme becomes attractive to businesses, employers, and government agencies that can then choose to pay through CBDC payments.

A CBDC payments rail offers other potential conveniences, such as for the rapid disbursement of government benefits. Where the scheme is popular, it offers a way for the government to provide support regularly and with greater certainty. Those entitled to government benefits (e.g., Social Security, Supplemental Nutrition Assistance Program (SNAP), monetary assistance for displaced persons) might sign-up for an account as a way to receive benefits. When the benefit ends (e.g., where someone passes away) but where a payment is sent in error, embedded programmability allows the CBDC to simply extinguish itself, with value returning to the taxpayer. These benefits are distinct from those that accrue within a scheme like Pix, UPI, or Faster Payments. As detailed in Chapter 1, financial inclusion has followed where users have been introduced into a cheap, fast, and networked payments environments. In a CBDC-scheme, these gains can exist, alongside the added capacity for users to access secure, programmable central bank money.

A CBDC-based retail payment system requires policymakers to decide how a CBDC ought to be designed - and what kind platform is likely to support its workings. Within accounts-based or token-based systems, one option lies in having the CBDC run on a platform that is based on a shared ledger (members all pool and see the data) that constantly records the movement of money between
users. This kind of design appears to have found some favor, for example, as outlined by the Bank of England in the U.K’s consultation paper on a possible digital pound.

How the ledger does this reflects a crucial design choice. One option is that the system behaves in a more decentralized way – where disparate member nodes of the network arrive at consensus about whether a batch of new trades ought to be incorporated into the transaction record. This reflects a more decentralized blockchain-based approach, where participating nodes evaluate and approve a block of transactions by collective consensus before introducing them into the ledger. Once approved, money can be transferred. An avowedly decentralized approach is unlikely to be suitable for highly public and systemically essential infrastructure. In other words, the central bank will have to play a mainstay role in operating and backstopping the CBDC platform.

Another option gives the central bank the power to create and operate the ledger. Under this model, authorized payment services providers only have the right to submit entries to it requesting updates to the record in response to a customer order. Once details are validated, money moves. One feature distinguishing the CBDC-ledger model from Fedwire, or the ACH system, lies in the possibility that an intermediary’s account does not need to be credited. Unlike a payment transaction made over Fedwire or the ACH network, there is no money first flowing into an intermediary’s master account before being credited to that of the customer. The system can gain speed because the intermediary acts primarily to input proposed payment transactions through its interface with the ledger. But when approved, the money moves automatically from one customer CBDC account to another, rather than first coming to rest in the books of a payment service provider. The digital ledger gives payment services providers access to write changes into it. Beyond that, money moves between users, removing a middle step common to payment schemes.

The efficiency of such a system can be enriched where payment services providers layer-on automated processes (colloquially, smart contracts) programmed to move money at certain times to particular addresses. Such conveniences can enable regular payment of bills (reducing the chances of late charges and debt collection), enforcement of particular mandatory payments (e.g., taxes) as well as optionality to structure payments in creative ways (e.g., to set spending limits for children, where the CBDC account makes available specific amounts of dollars per week). These efficiencies build on the CBDC ledger, affording payment services providers a chance to develop useful add-ons beyond the basic payment account distribution service.

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292 See, e.g., Bank of England, supra note [234].
These designs raise various complicating factors to consider. As made clear in statements by the Fed and Treasury, as well as international policymakers, CBDC accounts are likely to be provided to users through a private payment service provider rather than directly by the central bank. Because private intermediaries will offer accounts, they may prefer a settlement model that requires that money first land in their master account before being transferred to a customer. Compliance may be eased: a payments firm can perform basic checks to verify that the money movements match those recorded in the instructions, that the payee’s account remains current (e.g., the payee is alive), and can respond if there are mistakes. This helps reduce the frequency of errors and the need for refunds – creating some mitigation for the inherent risk that rapid payment and settlement schemes necessarily mean that transactions happen too quickly to prevent mistakes.

This payment system would represent a new rail for the marketplace and mark a different experience from what is available using Fedwire, the ACH network as well as FedNow. Using a new CBDC-based rail, money should aim to move rapidly (ideally, close to instantly) between retail customers. Such rapid processing speeds would mean a fundamental change from the ACH network. Fedwire does provide a rapid payment system, but only for large-value payments made between major financial firms – not everyday people. To be sure, FedNow proposes to set up a real-time payments scheme to enable people to make payments to one another through their banks. A CBDC payments rail would still be distinctive from FedNow. For one, as currently envisioned, FedNow looks set to be anchored by banks as intermediaries. Importantly, because it relies on banks, it anticipates payments being made as non-programmable private money claims. A CBDC-payment scheme would allow customers to make and receive payments in central bank money. By virtue of processing central bank claims, the scheme would represent a very low/zero-risk proposition from the standpoint of the credit risk of the claims. With claims carrying essentially no credit risk, it opens the door for the scheme to be anchored by both bank as well as non-bank intermediaries – meaning that it may also be used by those that are unbanked or underbanked.

On a cautious note, a CBDC-based payments system that is inclusive, cheap, smart, and usable depends on deeper policy changes that propel adoption. Promoting access to and excitement about a digital economy requires ground-level efforts to also improve measures of financial and digital literacy, ensuring availability of high-speed internet to all, fostering educational initiatives and protective tools to ensure that those coming into a more formal financial system are not preyed upon by opportunistic actors.\footnote{Aaron Klein, \textit{Can Fintech Improve Health} (Sept. 2021), https://www.brookings.edu/wp-content/uploads/2021/09/20210922_Klein_Can_fintech_improve_health.pdf (highlighting the risk that the digital economy can disenfranchise the poor and those from underserved communities).} As noted above, it also depends on a proper system of governance that assures users that their privacy and data are not at risk of being compromised. A failure to adopt such policy changes for a CBDC-based payments scheme can result in harmful outcomes. People end up not using the service. They grow disenchanted with it. Implementation blindspots leave them vulnerable to being taken advantage of by scams, high user costs, technical disruptions and time and
privacy lost. The potential of the technology is wasted and, crucially, its capacity to draw in those that might otherwise see real economic benefits.

**Settlement CBDCs**

Programmable CBDCs and global stablecoin networks introduce the possibility of reimagining the structure of the core rails for payments clearing and settlement.

CBDCs might enhance the efficiency of clearing and settlement by trying to move beyond the usual dichotomy of gross versus net settlement systems. In particular, they raise the possibility of programmability being deployed to enable CBDC digital dollars to act as settlement assets in ways that can better preserve liquidity as well as limit credit risk.

The basic idea looks to use programmable CBDCs specifically dedicated to clearing payments through the Fed’s master account network. Presently, the Fed collects payment transaction data, clears it, and then send instructions for money to move between bank master accounts. This requires four basic steps to take place: (i) payment instructions are sent by the bank to the Fed; (ii) the Fed engages in clearing; (iii) it instructs how debits and credits should be processed; and (iv) the money moves between master accounts.

But could the programmability of CBDCs enable the creation of a settlement system that can eliminate one or more of these steps? Could a programmable currency - being essentially a set of sophisticated algorithms - be set to constantly read the real-time order book of transactions and to automatically determine whether to update its internal record to reflect a switch in ownership from Payment Service Provider A to Payment Service Provider B without requiring the Fed to send separate instructions for the transfer? Such a system invites the possibility of CBDC to operate intelligently, to read incoming data and to automatically revise ownership rapidly to reflect shifting balances of credits and debits.

A more intelligent system can help move past a strictly sequential process where individualized instructions are each transmitted, cleared, and settled. It can help anchor one where the CBDC-settlement system is able to automatically update its entitlements across the system based on the incoming flow of transactions. Programmability might allow for much higher accuracy to estimate how much funds are likely to be received/ transferred between participants during the day. Analyzing historical data, and detecting transfer patterns (e.g., to account for seasonality, times of day, days of the week, institution size, reserve buffer depth, and so on), it may be possible to pre-allocate a certain amount of settlement-CBDCs to different participants in their master accounts. By incorporating artificial intelligence and pre-programming, CBDC entries could simply refine the balances, by pruning and adjusting entries from this initial allocation throughout the day in response to actual
incoming data. In so doing, the amounts flowing between accounts would likely be much lower, reducing the liquidity burdens weighing down the system.\footnote{On artificial intelligence in financial market applications, Christopher Brummer & Yesha Yadav, \textit{Fintech and the Innovation Trilemma}, 107 Georgetown Law Journal 235, 269-275 (2019).}

A “smarter” settlement asset, resulting in lower liquidity and credit risks – as well as reduced gridlock – holds plenty of benefits. For one, it spares the Fed from deploying extensive liquidity to support the constant cash demands of the system. In Fedwire, the Fed is tasked with making overdraft facilities available. Participants, too, have to be in a position to pay for this credit. Such a system can be expensive for all concerned. In reducing liquidity demands, a smarter system can end up being less expensive from a capital standpoint.\footnote{This may ultimately promote indirect, downstream benefits, through a more efficient use of capital that could potentially result in broader economic gains, like increased lending.} In costing less and by adjusting balances much more quickly during the day, it can also work to reduce the credit risks that traditionally weigh down the net settlement model. Importantly, a safer system with reduced operating risk and capital costs might afford policymakers greater comfort in opening access to master accounts for non-bank payment services providers. Because the system requires less capital and is less vulnerable to credit risk, it can afford to relax entry criteria to capture a larger set of participating firms. This broadening might facilitate more diverse access into the Fed clearing and settlement infrastructure, potentially enabling faster and cheaper settlement to be achieved by a larger group of key payment services providers within the economy. To be sure, this scenario is speculative. It may simply be too complex to execute. But depending on the design of a CBDC and the willingness of policymakers to consider programmability for CBDCs (e.g., for settlement), this idea seeks to leverage innovation to reduce settlement risk in a meaningful way.

\textit{Tokenization of Reserve Balances}

CBDCs can encourage the exploration of ways to “tokenize” ownership interests in reserve accounts (as well as in deposits held at financial institutions more generally).\footnote{Bank of International Settlements, \textit{The Future Monetary System}, BIS Annual Economic Report, 75, 77 (2022) (noting the potential for tokenized deposits).}

The concept of tokenization has a storied history in payments even though it has come to acquire high prominence recently with the popularization of cryptocurrencies and markets for assets like non-fungible tokens (NFTs).\footnote{Juliet Moringiello & Christopher Odinet, \textit{The Property Law of Tokens}, 7A Florida Law Review 607, 615-618 (2022); For analysis of the significance and meaning of tokens and tokenization within the crypto-community, Alexander Lee, Brendan Malone, & Paul Wong, \textit{Tokens and Accounts in the Context of Digital Currencies}, FEDS Notes (Dec. 23, 2020), https://www.federalreserve.gov/eresources/notes/fds-notes/tokens-and-accounts-in-the-context-of-digital-currencies-122320.html.} At a general level, in this context it refers to the ability to represent a set of ownership rights in another underlying asset using a so-called “token.” The classic example might be that of a deed to convey a piece of real estate. Legally, it reflects a bundle of rights with respect to an underlying asset – the house. Economically, it clarifies these ownership rights and allows them to be exchanged, resulting in the house gaining enhanced value. A set of deeds might sell pieces...
of the real estate to a group of people, with equal entitlement to the value it holds.\textsuperscript{302} In the world of payments, the most well-recognized token is the banknote.\textsuperscript{303} It is a convenient way to crystalize, display, and legally represent the right to a distinct portion of the U.S. money supply.

Tokenization offers the chance to digitally represent ownership to assets held within a reserve account at the Fed.\textsuperscript{301} That is, the Fed would mint digital tokens that serve to represent the monetary value held within a reserve account, either in regular U.S. dollar deposits or deposits of CBDCs.\textsuperscript{305} The goal of tokenization would lie in making these reserves work more flexibly in order to support a host of collateralizing/safeguarding processes, including those that are not directly housed at the Fed. By tokenizing a portion of regular/CBDC reserves, a payment service participant’s tokens could be deployed to support a stablecoin. For example, Payment Firm might decide to issue its own stablecoin – PF Coin. Holding a master account with the Fed, the Payment Firm might tokenize some of its reserve account. This would allow for tokens to be flexibly listed – perhaps on a blockchain or on an exchange, allowing holders to exchange their PF Coin for a reserve token. The ability to tokenize reserves and make tokens available for checking and redemption would offer clear assurance that Payment Firm had sufficient assets to honor claims. In addition, if particular stablecoin issuers are not allowed to have a master account with the Fed, policymakers might consider allowing reserve tokens to be purchased by the stablecoin issuer or available to backstop the issuer’s exposures, such that the issuer could show that it had a right to a tokenized portion of a member’s reserve to demonstrate confidence in the stablecoin.

Tokenization of Fed reserves, and perhaps particularly CBDC-denominated reserves, would offer a number of advantages. By being tokenized, the value within the underlying asset becomes more portable, able to move on digital rails, potentially capable of being held outside of the Fed’s master account system, and being made to be interoperable with a range of different networks and payment schemes. In addition, the tokenized entitlement to the reserve can have properties that do not apply to the actual reserve assets themselves. For example, the token could reflect entitlements to a bundle of CBDCs (one token for 100 $1 CBDCs) or fractions of CBDCs (one token for 1/1000 of $1 CBDC), rather than necessarily being matched 1:1 to the actual CBDCs themselves. This flexibility could allow the token to take on greater utility by incorporating payment features useful for a particular industry or payment system (e.g., stablecoins or digital gaming environments). This tokenizing process could ensure that the full power of the central bank reserve asset can be deployed broadly across the economy.

Tokens based on CBDC-denominated reserves might be particularly useful in enabling robust functionality. The programmability within CBDCs could allow the CBDC currency to be directly

\textsuperscript{302} Moringiello & Odinet, supra note [301], 622-624 (detailing the way a deed works as a token to convey entitlements in real property).
\textsuperscript{303} Moringiello & Odinet, supra note [301], 615-618.
\textsuperscript{304} This is not to be confused with a token-based CBDC versus an account-based CBDC. For discussion of the various meanings of the term “token” within a similar context, Lee, Malone & Wong, supra note [301].
matched to its tokenized representation. Where a person holding a token wants to enforce it against the CBDCs, payouts might also become automated, to the extent that programmed-CBDCs are able to potentially self-segregate in response to an outside trigger. This would avoid the risk that Payment Firm decides to deplete its reserves, even though the token-holder is entitled to value from it. Smart capabilities can thus be useful in ensuring that the supply of tokens remains commensurate with an appropriate reserve of the CBDC-currency. For example, regulators may stipulate that the value of tokens written against CBDC reserves cannot exceed 90% of the value a firm’s CBDC reserves. By relying on CBDCs-denominated reserves specifically, programming compliance into the actual currency could provide a set of automated constraints that alerts an account holder as well as regulators that token issuance limits are being reached. In other words, where tokens are issued against CBDC-reserves, programming within a CBDC can help to tangibly connect a token to the underlying CBDC currency pools in ways that are not possible with dollar entries in a simple Fed master account.

To be clear, this idea, too, might appear too ambitious and unworkable. For one, tokenizing systemically critical assets like reserves could be harmful, especially in situations when doing so limits the ability of an account holder to access reserves to protect itself. For example, if tokenized reserves are lent out by a Bank and used as collateral by a Stablecoin Issuer and the Bank faces collapse, then the Bank will find itself in trouble when seeking to use its reserves to protect itself (because a portion of these reserves are tokenized and tokens are being used by another actor as part of its safety buffer). In addition, detailed public accountability for tokenized reserves, revealing how many tokens are available and their value, who is collateralizing them and on what terms, could also be risky for a financial system seeking to protect the stability of lowest-risk assets. If the Stablecoin Issuer looks shaky and may need to redeem the tokens, then this may result in depleting a Bank’s reserves and potentially requiring Bank to then raise more money to replenish them. Where granular information on key assets becomes more public, the risk arises that the market comes to view a master account holder as risky, insufficiently capitalized, or less well buffered than its peers, incentivizing a run or raising the account holder’s funding costs. Unlocking value within reserves through tokenization, then, necessarily raises a host of complex considerations for further research. But it also holds out opportunities for creating economic gains, where unlocked value may be deployed across multiple payment settlement systems more flexibly.

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Chapter 3: Open Questions for Policy

A. Charting the Path Forward

Why it All Depends on Regulatory Policy

The 1970s were a difficult decade in the United States. Like today, policymakers were struggling to devise solutions to cope with a multitude of shocks like high inflation, recession fears, and global conflict. And like today, the U.S. Treasury needed to borrow money to fund itself through the turmoil.

But despite the risk-free status of U.S. government bonds, the Treasury found itself stumbling in its efforts to raise the money it needed. Between 1974-1976, the U.S. embarked on a flurry of debt issuance, going into the capital market nine times in the fiscal year for 1975, more than doubling the previous record of the four standalone offerings it made in 1972. Per its usual practice at the time, the Treasury was largely focused on trying to raise money “tactically.” It would embark on a new fundraise to meet the needs of the moment – varying the terms of the debt (e.g., maturity) depending on Treasury’s preferences and the costs involved at the time.

This tactical approach gave Treasury a number of advantages – but it came with dangers. On March 20, 1975, for example, the Treasury launched an offering aimed at raising $1.25 billion. On the same day, however, Morgan Stanley’s underwriting syndicate also unveiled what was then the biggest industrial bond issue in history – a $300 million offering for General Motor’s ultra-safe AAA-rated bonds. The U.S. Treasury stumbled as investors were torn between two competing deals. The tactical, just-in-time, offering triggered chaos, leaving the the Treasury unable to raise money it needed.

What followed next was a policy swerve. The Treasury gave up its practice of raising money tactically. Instead, it would move forward more transparently. The Treasury would fundraise in a way that was much more “regular and predictable.” The market would know far in advance how the United States would raise money, when, and on what terms. There would be no more guesswork – just the boring predictability of a pre-set schedule.

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309 Garbade, supra note [308], 63-64.
310 Garbade, supra note [308], 53-55; 63-64.
311 Garbade, supra note [308], 64.
312 Garbade, supra note [308], 64-68.
Since the late 1970s, the United States has replenished its funding using this transparent approach. Auctions are held in accordance with a known timetable: they are not canceled just because Treasury does not need the money. This method has won high praise from investors, who have credited it with providing clarity, predictability, and steadiness. In turn, the regular and predictable course has also helped the taxpayer, as the United States can raise money more cheaply.\footnote{Garbade, supra note [308], 64-68.}

Regular and predictable market policy can, therefore, provide a strategic edge and benefit both the public and private sector. But, policy’s current approach to stablecoins and CBDCs lacks the regular and predictable: a clear, known regulatory roadmap for industry and regulators to use when considering whether and how to deploy these technologies. To be sure, New York State has offered a blueprint, with the New York Department of Financial Services providing a regulatory framework on digital asset oversight, including stablecoins. But, at the federal level, critical questions remain without precise and predictable answers, creating risks that either private issuers engage in these activities without sufficient clarity about how to protect customers and the market, or they decide to avoid entering the market until such time as legal clarity can be provided.

From the collapse of the Terra-Luna stablecoin ecosystem in May 2022 to the failures of former crypto-luminaries like Celsius, Genesis, and FTX, the scale and severity of the fallout underscores the need for urgency in developing policy solutions to address the demands of digital asset markets. A number of areas are emerging as particularly salient within the digital asset marketplace generally and in the context of stablecoins more specifically. For example, how might policy ensure that customers holding digital asset claims are fully protected and able to be made whole, even against the bankruptcy of the issuer? What rules ought to apply to issuers to maintain the safety and soundness of issuers as well as to ensure that their internal corporate governance and risk management conforms to high standards? Under what mix of state/federal/private oversight ought stablecoin issuers be overseen? As detailed below, these areas of inquiry reflect just the tip of the iceberg, and point to uncertainties whose resolution will be critical before stablecoin use cases can be fully embraced by customers as well as the marketplace.

The goal of this Chapter lies in setting out a few of the key policy debates that arise in the context of stablecoin and CBDC oversight. It does not attempt to offer definitive solutions to these questions but to outline, at a high-level, their significance and the trade-offs involved. Further, from the standpoint of U.S. soft power, such reflection can encourage United States’ leadership as an innovator in payments, as well as in crafting the regulatory and operational standards that might underpin digital asset payment infrastructure both within domestic regulation as well as in international standard-setting.

B. Some Key Considerations for Reform
Stablecoins and CBDCs offer opportunities to enhance the capacity, efficiency, and reach of the payments system in new ways. So far, however, the United States has progressed at a relatively slower pace than others in reforming payments infrastructure as well as the legal framework underlying it. This has meant limited clarity around critical concepts – such as the role of fintech and other non-bank payment service providers, customer protections for digital asset holdings, eligibility conditions for master accounts, and authorization to directly access payment schemes like the ACH network or Fedwire. These questions are, arguably, foundational as the first-order discussions that will eventually lay the groundwork for more specific deliberations around whether and how to regulate stablecoin ecosystems, or the issue and distribution of CBDCs.

Other countries have begun to address these questions and to implement far-reaching changes within their domestic payment systems. In some cases – like the European Union – payments reform began well over a decade ago in 2008 with the development of the Payment Services Directive and the roll-out of the Single Euro Payments Area. As detailed in Chapter 1, infrastructure development to build real-time payment rails is underway around the world. In places like Brazil, India, Sweden, Thailand, and the United Kingdom, for example, real-time payment rails have become deeply interwoven within the fabric of the domestic economy. More broadly, countries have developed regulatory regimes to clarify the role of digital non-bank payment providers and those – like issuers of prepaid cards – that are in the business of electronic money distribution. For example, the E.U. Payment Services Directives and those for Electronic Money have offered a framework to govern non-bank payment firms as well as those involved in discrete activities like e-money issuance. More recently, Canada, Singapore, and Japan have proposed different models of regulation for non-bank payment providers, with Singapore and Japan establishing regimes that look heavily to the riskiness of a payment firm’s activities and its footprint within the local payments’ systems. Looking forward, countries and regions like the European Union and the United Kingdom are pivoting to develop governing policies to guide digital asset oversight, including with respect to CBDCs and stablecoins. 

In many ways, it makes sense that the United States should want to go slow in reforming its payments environment and ensuring caution when considering rollout of CBDC and stablecoins. For a start, its economy and financial system – alongside the U.S. dollar – are uniquely significant, large, systemic, and globally connected. Rapid or constant shifts within the plumbing of its payments infrastructure are bound to create repercussions that travel widely and deeply into domestic and well as international economic life. To support the risks involved in maintaining payment flows, it follows that U.S. regulators have opted to take a careful approach in promoting regulatory reform.

At the same time, the costs of this caution are also becoming apparent. U.S. customers lack consistent access to services – like free/low-cost real-time payments – that are taken for granted in

314 See, e.g., Ming & Seow, supra note [174]; Jones Day, supra note [176].

other countries. This means that someone living in the United States is unable to take advantage of economic efficiencies in the same way as someone living in Sweden, the United Kingdom, or Singapore, for example. Moreover, a lack of regular and predictable clarity in rulemaking means that services providers can “pay” more to provide services, for example, by having to contract with a bank to clear payments, than what they might pay in the United Kingdom or Singapore, where licensed non-banks can get direct access into payment settlement systems. Importantly, reforms have been carried out in countries and regions that also represent large, diverse, and globally important economies. The European Union, for example, or Brazil and India, have managed to implement an ambitious and far-reaching strategic transformation of domestic payments. For CBDCs and stablecoins, progress made in developing regulatory frameworks and policy priorities has set the stage for launching pilot studies and real-world testing of use cases.

**Jurisdictional Questions**

**Navigating Federal vs. State-Based Oversight**

Pathways to reform within the U.S. payments system must first navigate the balance of state vs. federal oversight for payment services providers. A first key question facing policymakers is whether to progress reform in a broad-based way - as seen, for example, in the E.U.’s Payment Services Directives, the Markets in Crypto-Assets Regulation (MiCA), Canada’s Retail Payment Services Act, or Singapore’s Payment Services Act. Generally speaking, these measures seek to provide a roadmap for services providers, including non-banks, to undertake a range of services. They set out measures to cover such matters as the entry and participation licensing criteria, governance norms to ensure that firms are capable of complying with the risks entailed in the provision of services, as well as the role of regulators in maintaining the safety and integrity of the marketplace.

In the United States, importantly, state-based regulation, instead of a federal framework, has historically anchored payments regulation for the most part, particularly for non-bank institutions. Many non-bank payment services firms are categorized as money transmitters and regulated at the state level. States set out rules governing how much capital a money transmitter needs to keep, the amount of a surety bond/insurance that it must provide to demonstrate financial solvency, as well as restrictions on the kinds of investment vehicles through which the money transmitter can maintain customer money (e.g., in U.S. Treasuries, corporate bonds, etc.). State-based regulation has given rise to dedicated and experienced local regimes for rulemaking, monitoring, and enforcement.

Bank regulation operates within a state-federal framework under the “dual banking” regime. This requires banks to seek out a state license, or federal authorization as overseen by the Office of the

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316 18 U.S.C. § 1960(b)(1)–(B)(2) (generally referring to businesses that are “involved in transferring funds on behalf of the public” using a wide variety of means).
Comptroller of the Currency (OCC). FDIC deposit protection is generally available irrespective of whether the bank is authorized by a state like New York or by the OCC, as is access to the Fed’s payment and settlement infrastructure - meaning that FDIC-insured state banks with access to the Fed’s facilities do have some federal oversight. According to one 2017 study, around 80% of the country’s approximately 5,000 banks are state-chartered.

A first option might be to maintain a focus on state-based oversight. Regulators could be tasked with developing specific rules in relation to stablecoin issuers and CBDC distributors as well as particular activities relating to the provision of services connected to digital assets (e.g., offering a digital wallet). One existing example of such an approach is that put forward by the New York State Department of Financial Services, where a dedicated state-based oversight regime for digital asset and stablecoin issuance offers a specific framework, outlining a variety of stipulations in relation to issuer safety and soundness, governance, and conduct of business.

This approach comes with a number of advantages. First, it reduces any administrative disruption arising from rapid shifts in the regulatory and administrative oversight environment. This can ensure that existing expertise housed within state regulatory agencies can be leveraged to incorporate oversight of stablecoin issuance/CBDC distribution. Secondly, current state expertise in overseeing money transmission may have specific resonance. In the case of money transmission, for example, consumers submit funds in order to access them in the near future. Providers must maintain submitted funds to cover 100% of consumer liabilities by holding these monies in permissible investments that are generally viewed as stable and liquid assets. Similarly, stablecoins seek to offer consumers access to a claim with specific future value. Issuers must maintain reserves of high quality assets to support these claims. Clarity and effort will be necessary on the part of regulators with respect to understanding how best to calibrate stablecoin reserves to minimize risk. However, broadly, experience in overseeing money transmission may give states some advantages in supervising stablecoin-related issuance activities.

However, a federal regime may be viewed as more suitable in light of the potential systemic nature of stablecoin issuance and the policy importance of CBDC distribution. Arguably, federal regulators, including the Federal Reserve, can offer highly experienced, sophisticated expertise in managing the risks involved. One further benefit for issuers/distributors themselves might lie in the fact that a federal regime should preempt the requirements of 50-state-based regulators. This could make life easier from the standpoint of compliance by requiring adherence to one regime rather than potentially multiple different regimes depending on where the issuer does business in the country.

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A federal framework might establish a specific charter for stablecoin/CBDC distributors, setting up a variety of stipulations on reserve asset management, governance, prudential risk management, and so on. Policymakers will have to decide whether such a federal charter would be mandatory for all stablecoin issuers/CBDC distributors or provide an opt-in regime that operates in addition to different state-based ones. For example, in its April 2022 proposal for overseeing stablecoins, the House Financial Services requires non-bank stablecoin issuers to be authorized and supervised by the Federal Reserve.\footnote{For discussion see e.g., Timmy Shen, U.S. House Financial Services Committee Releases Draft Stablecoin Bill for Wednesday Hearing: Yahoo Finance (Apr. 17, 2023).}

But recent efforts to create a general federal regime for digital payment providers – pioneered by the OCC’s attempt to create a “fintech charter” – have faced heavy legal headwinds, confronting resistance from states worried about federal encroachment of state rights.\footnote{Lacewell v. Off. of Comptroller of Currency, No. 19-4271, 2021 WL 2232109, 13 (2d Cir. June 3, 2021).} In a handful of cases, the FDIC and formerly non-deposit institutions have agreed to conditional grants of national bank charters – that have permitted firms to offer FDIC-insured deposits and to come under the national banking regime. The OCC, however, has seen pushback in the context of applications for specialized national bank charters that do not allow the firm to issue deposits or to only take non-FDIC insured deposits.\footnote{Scott Coleman, OCC Approves National Bank Charter Applications of Fintech Company, Ballard Spahr (Jan. 24, 2022), https://www.consumerfinancemonitor.com/2022/01/24/occ-approves-national-bank-charter-applications-of-fintech-company/.} In other words, whereas non-banks can seek out a federal regime to turn themselves into national banks under the OCC’s authority, attempts for more non-standard banking licenses have proven more controversial for the OCC to grant. Further, as noted above in Chapter 1, Custodia Bank – a state-chartered, crypto-specialist could not persuade the Federal Reserve to grant its application for membership of the Federal Reserve System.

Finally, to address some of the prior challenges in creating alternative regimes, policymakers might look to focus on one discrete area for regulation rather than decide on an approach for a range of payments activities as part of a general authorizing statute. This might result in focused expertise being deployed to solve a specific set of issues. In the case of stablecoins, for example, specific federal rulemaking might cover matters concerning the quality of reserves that an issuer must maintain, how these assets ought to be safeguarded, disclosure to claimholders as well as procedures to address issuer insolvency (e.g., should stablecoin claimholders get higher priority on distribution?). While likely providing a workable way forward, an approach focused just on rulemaking by specific area alone could create a fragmented regulatory framework that requires constant future revision as innovations emerge into the marketplace.

\textit{Master Account Access}
The question of federal vs. state oversight connects to whether non-banks ought to get master accounts for themselves that give the Fed the ability to monitor issuers – and to stipulate conditions about how the account ought to be used (e.g., whether fractional reserve banking should be allowed). Using a master account system, the Fed gets a much clearer line of sight into the assets being used by an issuer and to see if these are sufficiently robust to prevent failures and systemic risks. In accessing information on master account holdings and having direct oversight of the issuer as well as other financial institutions, the Fed is well-placed to assess how widespread the damage from an issuer’s collapse might be and what kinds of interconnections are building between private firms. Importantly, by being positioned to analyze the systemic consequences of an issuer’s potential collapse, the Fed has an early warning mechanism to detect whether it needs to step in with emergency support. Rather than waiting for the run to occur, preemptive oversight can offer a way of stabilizing the system by equipping the Fed to intervene early and decisively.

The question of master accounts is of particular relevance for issuing stablecoins and distributing CBDCs. First, this question is especially relevant for stablecoin issuers because it will impact how and where reserve assets will be held – at a private bank or at the issuer’s master account with the Fed. At first blush, it is perhaps “simplest” for non-bank stablecoin issuers to remain outside of the master account system. This means that these issuers maintain their cash and securities holdings with a regulated intermediary, like a bank. An issuer operates much like non-banks do presently: stablecoin holders possess a store of tokens. Coin transfers within the network can occur rapidly. But any exit – where the tokens are redeemed for cash – necessitates the intervention of the banking system and its payment rails. Stablecoin customers will probably need a bank account. This system then resembles a P2P service but with the added capacity to transfer potentially large-value and cross-border payments quickly on a stablecoin’s settlement network.

This policy choice has a number of advantages. Because it mostly depends on existing convention, it does not require major policy shifts, saving regulators the time and effort involved to calibrate detailed rules to provide master accounts for stablecoin issuers. Additionally, it retains bank intermediation as a foundation. Because they hold cash (and possibly securities) on behalf of non-bank stablecoin issuers, banks can provide an element of gatekeeping. Banks can help scrutinize how much money is held by the stablecoin issuer, whether its account holds sufficient above a particular pre-set threshold. Emergency credit may be provided if an issuer’s holdings fall below what is needed. For the public and users of stablecoin, a bank might provide reassurance. However, as discussed below, this design creates dependence on the bank’s ability to remain solvent and to protect reserve assets and provide payment services. See, e.g., Schwartz, supra note [325].

But holding stablecoin reserve assets in a commercial bank’s master account also comes with risks. Stated bluntly, banks are risky by design. They fail – and they can take a stablecoin system down...
with them when they do. Specifically, banks might engage in fractional reserve banking with the stablecoin reserves assets they hold as part of bank deposits. Owing to fractional reserve banking, where a portion of the deposit is lent out, banks may be caught short if depositors/stablecoin claimholders choose to enforce their claims and redeem all at once. This risk invites consideration of whether one solution might lie in creating various models for safeguarding reserve assets that diversify away from relying exclusively on banks for custody and clearly defining the composition of reserve assets between bank deposits and other high quality liquid assets including Treasuries.

Importantly, a master account can help mitigate the risk of a private stablecoin issuer becoming too powerful within the global economy by anchoring issuers to the Fed as a home monetary base and regulator. By virtue of its authority to give access to the master account and related payment infrastructure, the Fed can more effectively oversee issuers’ compliance with applicable regulations and ensure that stablecoin issuers do not become too big and too important to fail.\footnote{David Beckworth, \textit{Manmohan Singh on the Role and Structure of Stablecoins and the Impact of Collateral in the Financial System}, Macro Musings (May 30, 2022) (highlighting Dr. Singh’s recommendation to allow access to Fed accounts to increase payment systems efficiency).}

C. Additional Issues for Stablecoin Issuance and CBDC Distribution

Looking forward, there is extensive need for detailed policy analysis to enable a digitized payment system to be put in place that can be a home to innovations like CBDCs and stablecoins. Two broad questions stand out. First, which type of regulated firm can issue stablecoins and distribute CBDCs. Second, in order to perform these functions, might existing payment rails be re-configured to accommodate new types of institutions.

Who Should Distribute or Issue CBDCs and Stablecoins

\textit{CBDCs}

At the outset, banks tend to have extensive domestic and cross-border networks of subsidiaries, branches, and affiliates. This capacity to inhabit a broad and international network can make it easier to use CBDCs as a payments tool capable of being deployed widely to acquire use value. Because they tend to have permissions to engage in an array of different financial services (e.g., lending, brokerage, market making), banks can potentially integrate CBDCs into an array of financial functions.

Banks also have ready-made advantages in offering accounts to distribute CBDCs to the public. Most importantly, it is in-keeping with their exclusive role as issuers of deposit accounts. This might help banks to rapidly distribute CBDCs by adding a CBDC account to a standard savings and checking product. This can encourage broad adoption as part of everyday public life. As accounts become more widespread, payment schemes can be developed to better enable CBDCs to be spent.
Innovators will have plenty of motivation to invest in the creation of payment systems as a way to tap into popular availability of CBDC accounts and growing ease of use.

Additionally, banks as distributors of CBDC may integrate CBDC accounts into monetary policy. Importantly, the Fed relies on banks to aid in the execution of monetary policy. Common channels for such assistance include (i) money creation through the deposit-taking and lending function; and (ii) calibrating the supply of money through the application of interest rates applied by banks to their customer savings and lending products.

CBDCs can add a further tool for banks to aid the Fed in performing policy. For example, as in Sweden, regulators may want customers to use CBDCs to offset an over-dominance of private money claims. To do this, policy might stipulate that the CBDC bank account pay out a relatively lower interest rate than the traditional deposit account. This move would nudge customers toward holding their private money claims at the bank, while deploying their CBDC as a means of payment. The CBDC may also be structured to pay out no interest rate at all – so that it more fully resembles cash – and, in this way, it would also promote its use against interest-bearing bank deposit claims.

There is a further, intriguing possibility - that the CBDC account could carry a negative interest rate. This means that some amount of the CBDC would gradually be eliminated/depreciate over time. In other words, the CBDC would help solve an age-old problem caused by the circulation of central-bank issued money. Because cash and coins generally do not accrue interest – paying a 0% rate – they set the interest-rate floor at zero. Known as the “zero lower bound,” its unshakable grip on monetary policy has constrained regulators in their ability to forcefully stimulate the economy. A CBDC could help solve this issue by presenting policymakers with a form of central bank money that is programmed to essentially disappear over time within a negative interest-rate environment (akin to a customer paying to deposit CBDC money).

The task of integrating CBDC into monetary policy offers regulators an opportunity to both utilize CBDCs as part of existing monetary policy as well as to develop a novel channel through which to deploy an expanded policy toolkit. Because banks have long been key supporting players in implementing monetary policy goals, they ought to be well-placed to continue collaborating with the central bank to forward macroeconomic priorities using CBDC.


Non-bank payments providers can offer significant benefits as well. A diverse range of firms have become essential players within the payments’ ecosystem. As detailed in Chapters 1 and 2, money remitters, credit card networks, P2P payment providers, and stablecoin issuers have grown to offer consumers choice and functionality on top of bank-led payment rails. Their expansive influence within the economy presents an option for distribution of CBDCs.

There are some distinctive advantages to bringing non-bank payment service providers into the distribution network for CBDCs. While banks have a head-start, owing to their exclusive role as deposit-taking firms, they also have drawbacks. Mainly, the banking system suffers from a lack of financial inclusion. Services attaching to bank accounts can be expensive (e.g., overdrafts and other fees). Detailed earlier, uneven banking coverage has impacted vulnerable communities most acutely – communities of color, those earning a lower income, without a high school and college education, or younger people. Entry formalities to apply for bank accounts can exclude those that do not possess the required credentials (e.g., those that are undocumented, un-or-underemployed or unhoused). Non-banks, such as money remitters, have demonstrated an ability to reach underserved consumers and to help them address their cash and payment needs.

Clearly, the question of what kinds of firm get take part is a critical one for policy to solve. If one of the signature aims of a future CBDC lies in increasing financial inclusion, relying on the banking system alone as private distribution partner will likely be insufficient. The distribution of CBDCs will likely prompt any distributor to focus first and foremost on introducing existing customers to CBDC. For banks, by definition, this includes those that are already participating within the banking system.

This fact of inequitable financial access in the United States highlights the necessity to consider CBDC wallet distribution through a flexible and broader lens. Set out in Chapter 1, non-bank payment providers like money remittance firms, P2P firms, or those issuing prepaid cards can tap into networks that tend to be underserved by banks. Remitters, for example, work closely with migrant communities sending money home. P2P payment firms have gained ground with younger users (though access to credit/debit cards and bank accounts is still generally a prerequisite). Prepaid cards are widely used across financially excluded communities. By authorizing a broad cross-section of banks and non-banks to host CBDC accounts, policymakers may be better placed to unlock the possible gains of a CBDC for inclusion and, as an added benefit, spur competition. As detailed in Chapter 1, a number of real-time, retail-orientated payment schemes like Pix or Faster Payments have expressly sought out non-bank participation. Exemplified by Pix, this has helped bring formerly excluded parts of society more fully into the financial system.

In addition, distribution of CBDC claims might not need to require the intensive capital regulation demanded of banks if they maintain their status as a direct claim on the central bank. In this scenario, unlike bank deposits – that reflect private money claims against a risky financial institution – CBDCs are a central bank claim. As the most money of money, CBDC claims ought not to be risky – rather,
the opposite. This opens up an opportunity for payment firms other than banks to aid in distributing them. Stepping back, it is easy to see why policy favors requiring depository firms to gain extensive authorization before they are able to offer demand-accounts as banks to the public. For money to be confidently accepted as money, the public must have confidence that issuers will not simply fail and default.

CBDC claims, however, are a different kettle of fish from standard bank deposits. In the United States, they will represent a credit risk on the U.S. government. For all intents and purposes, this would mean that they would carry essentially zero risk. Crucially, they would already come federally insured. There should be no danger of panicked liquidations as holders would always find themselves to be in possession of (digital) cash – and not a claim needing to be turned into cash. To be sure, this is not to suggest that CBDC distributors require no oversight at all. Policy will need to consider what institutional qualities a firm must possess in order for it to represent an interface between the state and the public. A high-risk firm can collapse for reasons that have nothing to do with its CBDC distribution business. When it does fail, though, customer accounts may be impacted and need regulators to ensure that they can be easily transferred to a viable firm. To avoid such situations, it is clear that policymakers will have to determine how best to craft workable eligibility criteria that afford access to participating distributors and promote safety at the same time. The point is simply that distributing CBDC claims means that firms are providing access to the most money of money. Unlike bank deposits, this money quality does not have to be produced by conferring special approval on the issuer of the claim. It is embedded in the claim itself.

Finally, it is worth asking whether inclusion of non-banks into CBDC distribution can work to enable a more precise and complete execution of monetary policy. Highlighted above, CBDCs may offer policymakers with some novel tools through which to channel monetary policy. For example, because CBDCs can exist digitally, they hold out the possibility of allowing regulators to by-pass constraints on the zero lower bound, meaning that currency can carry a negative interest rate. They may also allow regulators to deploy stimulus payments more surgically and address errors or potential frauds in the disbursement of such funds. By ensuring that CBDC accounts are widely available, including and especially to those traditionally outside of the financial system, regulators could have far greater confidence in monetary policy’s ability to make a difference. Further, digital money would allow for the study of policy effects through data collection and analysis, with fewer blind spots arising out of the widespread use of physical cash.

**Stablecoins**

A key policy question surrounding stablecoins lies in the determination of which kinds of institutions ought to be allowed to issue them. Stated simply, should this authorization be limited only to banks
or also include non-bank firms? At least presently, the major stablecoin issuers regulated in the U.S. represent non-bank firms – Circle or Paxos, for example. As detailed in Chapter 2, these and other major non-bank issuers have built an extensive infrastructure for issuance, distribution, and trading for their specific stablecoins, with the largest coins reaching a combined market capitalization of around $150 billion by end-2022.

Federal U.S. policymakers have generally favored placing stablecoin issuance within the banking sector, with the President’s Working Group (PWG) recommending that insured depository firms be the ones exclusively authorized to issue stablecoins. In forwarding this recommendation, the PWG underscored the risks raised by payment-focused stablecoins for the financial system. With the potential for a run on coins, resulting in plunging confidence in the capacity of coins to maintain their peg and enable payments, policymakers have pointed to these kinds of dangers as ones familiar to the banking system. With banks supervised and experienced in navigating the risks of sudden runs, choosing to put stablecoins within the perimeter of banking regulation offers a ready-made, understood option.

Detailed earlier in this Chapter, choosing a bank-based model for stablecoin regulation is likely to prompt further inquiries about whether a specific federal charter might be designated for the purposes of stablecoin-issuance. Akin to the category of payment banks in India, for example, a specific bank charter could offer a lever through which to oversee stablecoin issuance using a tailored mechanism designed to deal with core prudential risks, without necessarily requiring issuers to have to come under the full panoply of banking regulation.

Following the PWG’s support for a bank-based regulatory model for stablecoins, federal policymakers have expressed a mixed set of sentiments for including non-banks within a well-regulated system of oversight. In some cases, greater openness has been signaled. That is, while being regulated for prudential risks, for example, stablecoin issuers might not need to obtain deposit-insurance, such that non-banks could potentially also qualify within a more broad-based understanding of a “bank-based” oversight paradigm.

However, pronouncements by federal lawmakers following the failure of major crypto-firms like FTX have also signaled a tougher posture toward cryptocurrencies. Crucially, despite the PWG favoring a bank-only model, bank regulators have nevertheless expressed extreme concern about the prospect of banks engaging with crypto-assets. While noting that crypto-related activities are not prohibited, the FDIC, the Fed, and the Office of the Comptroller of the Currency have jointly highlighted that issuing or holding crypto-assets as principal constitutes an activity that is inconsistent with safe and

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In determining which institutions ought to perform the role of stablecoin issuance, a further complicating factor facing regulators is that major banks have recently shown themselves vulnerable to experiencing sudden collapse. Despite being regulated and supervised by state and federal regulators as well as benefiting from FDIC deposit insurance, the failure of Silvergate Bank, Silicon Valley Bank, and Signature Bank is a reminder of intrinsic risks within the banking system and the critical role of risk management.\footnote{See, e.g., Telis Demos, \textit{Investors Are Searching for Safe Spaces in Banking}, The Wall Street Journal (March 13, 2023), \textit{Investors Are Searching for Safe Spaces in Banking}, MacKenzie Sigalos, \textit{Crypto-Focused Bank Silvergate is Shutting Operations and Liquidating after Market Meltdown}, CNBC (March 9, 2023), https://www.cnbc.com/2023/03/08/silvergate-shutting-down-operations-and-liquidating-after-market-meltdown.html.} Prior to its fall in March 2023, Silicon Valley Bank, for example, was a four-decade mainstay of the U.S. innovation economy, holding around $200 billion in assets and exerting global reach through the provision of a variety of banking and financial services.\footnote{See, e.g., Telis Demos, \textit{Investors Are Searching for Safe Spaces in Banking}, MacKenzie Sigalos, \textit{Crypto-Focused Bank Silvergate is Shutting Operations and Liquidating after Market Meltdown}, CNBC (March 9, 2023), https://www.cnbc.com/2023/03/08/silvergate-shutting-down-operations-and-liquidating-after-market-meltdown.html.} Among their various business lines, Silvergate Bank and Signature Bank provided specialist services with special appeal for digital asset businesses – the payment networks, Silvergate Exchange Network (SEN) and Signet, that facilitated fiat money flows between customers 24/7/365 to match the always-open ethos of the crypto-economy.\footnote{See, e.g., Telis Demos, \textit{Investors Are Searching for Safe Spaces in Banking}, MacKenzie Sigalos, \textit{Crypto-Focused Bank Silvergate is Shutting Operations and Liquidating after Market Meltdown}, CNBC (March 9, 2023), https://www.cnbc.com/2023/03/08/silvergate-shutting-down-operations-and-liquidating-after-market-meltdown.html.} At the time of its failure, Silicon Valley Bank held around $3 billion in assets for stablecoin issuer, Circle.\footnote{See, e.g., Telis Demos, \textit{Investors Are Searching for Safe Spaces in Banking}, MacKenzie Sigalos, \textit{Crypto-Focused Bank Silvergate is Shutting Operations and Liquidating after Market Meltdown}, CNBC (March 9, 2023), https://www.cnbc.com/2023/03/08/silvergate-shutting-down-operations-and-liquidating-after-market-meltdown.html.} While the detailed causes of these bank collapses remain to be investigated, secular factors (e.g., increasing interest rates), concentration of vertical-specific customers sensitive to rising interest rates (e.g., venture-backed startups and crypto-economy startups), and aspects of bank internal risk management (e.g., composition of capital buffers, internal compliance quality) may have played a critical proximate role in stressing balance sheets and opening then up a sudden run.\footnote{See, e.g., Telis Demos, \textit{Investors Are Searching for Safe Spaces in Banking}, MacKenzie Sigalos, \textit{Crypto-Focused Bank Silvergate is Shutting Operations and Liquidating after Market Meltdown}, CNBC (March 9, 2023), https://www.cnbc.com/2023/03/08/silvergate-shutting-down-operations-and-liquidating-after-market-meltdown.html.} In short, this slate of bank failures, prompting federal regulators to institute a sweeping set of nationwide measures to backstop deposits, including those exceeding the normal FDIC insurance limit, highlights inherent risks within the regulated banking sectors and the constant challenges of risk management that it faces. Despite historic expertise in managing run risk, as well as state and federal supervision, the insulation of banks from rapid failure cannot be taken for granted. This begs the question of whether reserve assets ought be concentrated in just one type of counterparty (a bank).

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Importantly, a number of existing frameworks for regulating stablecoins allow non-banks to be licensed as issuers. New York’s Department of Financial Services, for example, permits non-banks to acquire a license for virtual currency businesses, with special scrutiny for any activities that involve issuance of a stablecoin. The NYDFS makes clear that, within its general licensing regime for virtual asset businesses, stablecoins occupy a distinctive space, meriting compliance with particular conditions for reserve assets backing issuance and ensuring the redeemability of coins.344

Outside the United States, MiCA envisions allowing non-banks authorized as electronic money institutions (under the E.U.’s E-money Directive) to issue/list stablecoins. Recognizing the prudential nature of such issuance, the European Union tasks the European Banking Association (EBA) with overseeing stablecoins, and subjecting larger issuers to additional regulatory stipulations.345

These policy choices make clear that the decision between banks vs. non-banks in stablecoin issuance is not a binary one. Recognizing the prudential risks, existing regulatory frameworks can look to apply traditional safety-and-soundness strategies to mitigate the dangers (e.g., ensuring that asset reserves are high-quality and resilient, a regulatory regime that provides for additional requirements like capital buffers to match the size of the issuer and the scale of its activities). At the same time, some conventional types of banking protections may be unnecessary. Deposit insurance may not be needed where reserve assets fully support outstanding stablecoin claims and where these reserve assets are subject to custody arrangements that protect them from being subsumed into the bankruptcy or failure of a custodian (as discussed more below).346 Where non-banks act as issuers – and where reserve assets are marked for highest quality, segregated, and tightly constrained in how they can be held and invested – a prohibition on fractional reserve banking using reserve assets can help prevent the kind of acute run risk that generally requires deposit insurance. As policymakers note, the complexities in neatly categorizing stablecoins mean that regulatory approaches are increasingly being asked to be tailored, nuanced, adaptive, and sensitive to their features and functionalities as potential large-scale payment instruments.347

Ensuring Protections for Customers and Reserve Assets

Ensuring that stablecoin users – and reserve assets – are fully protected constitutes a priority for policymakers and foundational for ensuring confidence in the capacity of stablecoins to perform

344 New York State, Virtual Currency Guidance (Jun. 8, 2022), https://www.dfs.ny.gov/industry_guidance/industry_letters/il20220608_issuance_stablecoins#:~:text=The%20stablecoin%20must%20be%20fully,end%20of%20each%20business%20day.


346 See, e.g., Huang, Miao & Ostroff, supra note [342] (on Circle’s asset holdings in the failed Silicon Valley Bank).

effectively as payment mechanisms. How regulatory policy achieves these aims remains an essential question, particularly as the failures of crypto-firms like FTX, Celsius, Genesis, and Voyager Digital reveal the economic cost and personal pain that arises where rulemaking is insufficiently protective of customer ownership rights in crypto-assets. Further, the failures of Silvergate Bank, Silicon Valley Bank, and Signature Bank underscore the risks faced by depositors – including stablecoin issuers – that can arise from holding otherwise highly stable cash-assets at vulnerable banking institutions. The issues for resolution here are extensive. But a few are worth briefly noting to illustrate the nuance and complexity of the policy decisions facing regulators.

First, and most significantly, standards must provide clarity on the quality of assets that issuers are required to maintain to ensure that stablecoins can, in fact, be stable. As set out in Chapter 2, this means ensuring that issuers are clear on what quality of assets qualify to support an issue (e.g., cash, U.S. Treasuries, the desired maturity of fixed-income assets) – and importantly, how those assets are to be maintained for safekeeping and their risks managed (e.g., the potential need for financial hedges to mitigate the possibility of sudden losses on reserve asset values). Importantly, as highlighted above, should these assets be subject to restrictions on their use and further investment? For example, if a stablecoin issuer deposits cash reserves at a bank, then this cash may be subject to the bank’s ability to engage in fractional reserve banking.

A further critical consideration for policy lies in ensuring that these reserve assets are held for the benefit of customers – holders of stablecoin claims that expect these claims to pay out from the liquidation of reserve assets, if necessary. This implies emphasis on ensuring that assets can be maintained and legally treated in a way that assures that customers benefit from the economic value of reserve assets and have the right to assert a claim against them, even where the issuer or custodian itself is in bankruptcy. In other words, these assets can be legally categorized as immunized from the bankruptcy of a stablecoin issuer/asset custodian. If and when the stablecoin issuer/custodian enters insolvency, reserve assets remain unaffected and do not enter the insolvency as assets available to the bankrupt firm’s estate to pay off its own creditors. For issuers that have an international footprint, legal certainty will also necessitate ensuring that assets are allocated and easily accessible to customers within a particular country.

Relatedly, with customer rights so directly implicated, policy would have to determine how best to ensure effective disclosure of underlying reserve assets in a way that can provide assurances about safety and soundness – as well as create legal accountability for the issuer in case such disclosures are misleading or incorrect. Crucially, however, disclosure often raises some tricky issues for

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10 In addition, the Securities and Exchange Commission commenced investigation of Paxos, as issuer of Binance USD, suggesting that BUSD could be classified as a security, and accordingly, that BUSD constituted an unregistered security. This action raises the risk of similar investigations being launched by the SEC on the theory that stablecoins may be classified as securities, though as at the time of writing a formal complaint setting out the theory of this case has yet to be filed. See, e.g., Vicky He Guang, Patricia Kowsmann & Dave Michaels, Crypto Firm Paxos Faces SEC Lawsuit Over Binance USD Token, The Wall Street Journal (Feb. 12, 2023); Note, however, that in its civil suit against Binance, the CFTC contends that the BUSD token is a commodity. CFTC vs. Changpeng Zhao, Binance Holdings Ltd. & Samuel Lim, Case: 1:23-cv-01887 (Mar. 27, 2023).
policymakers. Expansive and constant transparency can sometimes prove risky in the context of regulating entities that are subject to a run on assets. Customers might see certain information, panic, and prompt a crisis where none might have needed to exist. Especially where information might be dense or complex, and analysis requires expertise, untrained eyes may fix on selective news and draw incorrect or overly negative conclusions, leading to problems. Social media may fuel a particularly damaging dynamic, where rumors become viral and cause any number of claimholders to rush (perhaps mistakenly) for the exit. The demise of SVB, for example, exemplifies the potential for social media to accelerate a run – where over $40 billion was pulled from the bank by panicking depositors in just a couple of days.349

Equally, however, regular, professionally reviewed public disclosures of reserve assets constitute critical tools for building trust, confidence, and signaling compliance within the stablecoin ecosystem. As part of developing a disclosure regime, policy might consider instituting regular vetting and rating by regulators themselves, or potentially by expert third parties like accounting and auditing firms, or firms akin to credit rating agencies. Because asset composition might change rapidly, indeed, day-by-day, a key question here will be to decide how frequently disclosures will be needed. For example, annual, or even quarterly disclosures may be too infrequent to be meaningful – but overly frequent releases introduce the possibility of the data containing too much unrelated “noise” for this information to be clearly understood. To avoid the risk that transparency might induce confusion and/or panic, such disclosures would also require tailoring to convey salient information fully and effectively and to explain its significance in an engaging way.350

At a fundamental level, these decisions go to the heart of determining how to develop policies that offer a highly robust, transparent, credible, and validated governance structure for stablecoin issuers. In addition to matters of corporate governance (e.g., ensuring a well-functioning, high-quality board of directors, auditors, lawyers), is the issue of policy assuring strong risk management and safe customer engagement. Decisions about how to achieve such outcomes will require deliberations surrounding oversight of various relationships that stablecoin issuers will develop as between: (i) the issuer and regulators at the state/federal level or both; (ii) issuers and customers; and (iii) issuers and third parties, such as crypto exchanges, wallet providers, asset custodians, and others. At each level, an oversight framework will have to address the various risks and uncertainties that are implied within each of these relationships. For example, for regulators, an oversight framework will require licensing, monitoring, inspection, and enforcement regimes that are effective and workable. Crucially, customer engagement will demand a certain level and clarity of disclosure, allowing easy evaluation of whether reserve assets are sufficient and how their claims may be redeemed against the


issuer. With respect to third parties, stablecoin issuers will need to ensure that they select credible third parties (e.g., when selecting digital wallet providers) and follow rules prescribed by such third parties that undergird the utility of stablecoins (e.g., exchanges may wish to get information about reserve assets to assure themselves of the capacity of the coin to act as a payment mechanism).

These topics outline the significance of the regulatory enterprise underpinning stablecoins and the critical role that policy has to play in ensuring that these innovations can fully live up to their promised usefulness for the U.S. and international payments system.

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351 See generally, Brummer, supra note [350].
Conclusion

Payments hold a central place within society and policy must ensure that payment technologies enable the economy to operate at its fullest and most efficient potential. Our payment habits have transformed in recent years, powered by adoption of smartphones, faster electronic communication, and social media, as well as COVID-19’s rapid de-emphasizing of cash as the quintessential means of facilitating everyday commerce. Yet even as the user experience of money has evolved, the basic plumbing needed to move money remains largely static in its design, delivering sub-par economic outcomes for consumers and domestic growth. Underinclusiveness within the financial system, slow settlement times, fees, and costs alongside the constant need for people and businesses to work around these shortcomings, mean that the policymakers are under urgent pressure to come up with systematic and lasting fixes. Stablecoins and CBDCs represent two novel technologies seeking to offer a way forward, provided that they can make a case for their use. This Report looks to explore that use case and to critically analyze its trade-offs. It posits a payments ecosystem where CBDCs and stablecoins might work in complementary ways, alongside other payment instruments to offer people, businesses, and financial firms greater choice, control, and peace-of-mind. Most importantly, this Report situates policy and regulatory reform at the heart of the payments economy. As exemplified by efforts carried out around the globe, dedicated analysis, rulemaking, and determined structural reform have elevated the place of payments from a mere logistical detail to a foundation for driving structural economic shifts and gains for local populations. In highlighting questions for policy, especially in this watershed moment in payments reform, this Report aims to spur the conversation toward a U.S. payments system that responsibly innovates to deliver the promise of fast, low-cost, inclusive movements of value.
**Glossary of Some Common Payment Methods and Concepts**

**Banks & ACH**

Banks occupy a special position within the financial system, having the twin abilities to issue deposits as well as to make loans enabling them to play a key role in expanding the money supply. In systems of “fractional reserve banking,” banks can lend out a portion of the money they hold for customers. This allows them to “create” money by enlarging the amount of money circulating within the economy. As noted earlier, banks also have access to master accounts with the Fed that enable them to connect to one another as a part of the Fed’s master account network (recall, non-banks have struggled to obtain master accounts).

These defining features of banking are important to accomplishing the core aspects of payment transactions. The first is customer-facing. Here, a bank provides the customer (a depositor) with access to a service like direct payments. It contractually details how this service will work and outlines the steps a customer must take in order to use the service (e.g., to set up a recurring payment authorization). The customer uses these processes to initiate a payment transaction.

The second feature is what happens next - in other words, the steps by which banks process this payment and transfer money among each other as part of the “clearing” and “settlement” system for payments. In simple terms, clearing refers to the steps by which banks make sure that payment instructions have been validly completed by a customer and then communicated to the counterparty bank. In practical terms, clearing involves the payer’s bank ensuring that details like the customer’s name and account number are correct, that they have sufficient funds in their account to backstop the payment, and that they have also provided accurate details for the payee for whose account the transfer is destined. Once the payer’s bank has completed these checks, it communicates these instructions to the bank of the person meant to be paid. To finalize the clearing portion of the transaction, the payee’s bank has to confirm and accept the message. After confirmation by the payee’s bank, the payment can be settled.

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352 Lawrence White, *Fractional Reserve Banking: Testimony Before the House Subcommittee on Domestic Monetary Policy and Technology*, Jun. 28, 2012, [https://www.mercatus.org/publications/monetary-policy/fractional-reserve-banking](https://www.mercatus.org/publications/monetary-policy/fractional-reserve-banking) (detailing the importance of banks as both issuers of deposits and lenders as the basis for the creation of fractional reserve banking).

353 Later this in this Chapter, the report discusses the importance of financial technology firms in providing certain user-facing interfaces, like digital wallets, as well as peer-to-peer communication networks).


Settlement marks the all-important step by which money moves from the payer’s bank to the payee’s. After it reaches the payee’s bank, it must be credited to the payee’s account. This is the finish line for the payment’s journey, after which the money is available for the payee to use.\footnote{For a discussion of payment finality and complexities in when funds are credited and available, see generally, Benjamin Geva, \textit{Payment Finality and Discharge in Funds Transfers}, 83 Chicago-Kent Law Review 633, 645-646 (2008) (describing the important concept of “acceptance by the beneficiary bank” for crystallizing obligations between banks and their customers on both sides of a credit transfer transaction).}

In a busy and bustling economy like that in the U.S., moving trillions of dollars in payments daily, the clearing and settlement process follows two basic models: (i) real-time clearing and settlement on a “gross” basis; or (ii) deferred clearing and settlement on a “net” basis.\footnote{NACHA, \textit{Same Day ACH Growth Leads ACH Network to Second Quarter Gains} (Aug. 2, 2022), \url{https://www.nacha.org/news/same-day-ach-growth-leads-ach-network-second-quarter-gains} (noting $19.6 trillion transferred in Q2 in 2022); Anton Badev, Lauren Clark, Daniel Ebanks, Jeffrey Marquardt, & David Mills, \textit{Fedwire Funds Service: Payments, Balances, and Available Liquidity}, Finance and Economics Discussion Series 2021-070, 1 (2021) (noting that $840 trillion were transferred using the Fedwire payments system); The Federal Reserve, \textit{Clearing and Settlement}, note [354]; The Federal Reserve, \textit{Fedwire Funds Service – Annual Statistics}, supra note [73].}

Both models diverge markedly in economic terms and pose distinctive risks for the capacity of the payment system to deliver fail-safe and efficient outcomes.

\textit{Real-Time Gross Settlement}

In a real-time gross settlement system, clearing and settlement happens essentially as close to instantaneously as possible. In addition, the whole sum of the payment is transferred each time, such that money moves on a “gross” basis. To achieve these rapid transfers, clearing and settlement happen essentially in parallel. This means that clearing instructions are, for all practical purposes, sent alongside those to carry out settlement. To enable rapid payment, each message is sent individually, and not batched alongside others.\footnote{Federal Reserve, supra note [354].}

This model for settlement comes with impressive benefits. Payments can be processed and finalized (as between the banks) extremely quickly.\footnote{But see, Morten Bech & Rodney Garratt, \textit{The Intraday Liquidity Management Game}, 109 Journal of Economic Theory 198 (2003) (setting up a theoretical model showing that banks have incentives to delay payments in order to reduce their costs of intraday borrowing).} This ensures that banks can use these fast transfers to make maximum use of cash liquidity. Significantly, banks are more assured that the risks of another bank failing in the middle of sending a payment are reduced. In other words, delays between clearing and settlement create danger that a bank becomes insolvent in the interim. Such an eventuality can impose heavy disruptions on customers where a failed bank’s payments suddenly end up locked in complex legal proceedings.\footnote{Federal Reserve, \textit{Clearing and Settlement}, note [354].}

But there are also downsides. A real-time gross-settlement is expensive because it requires banks to maintain large cash balances at all times.\footnote{Federal Reserve, \textit{Clearing and Settlement}, note [354] (detailing the “liquidity risk” that is embedded within this settlement model).} As money must be transferred on a gross-basis, a bank’s...
own account must have sufficient cash to support payment requests. This can sometimes pose a financial challenge – especially if transfers involve transactions requiring payment of large dollar sums. A payer’s bank can find itself short on cash, meaning that paying banks have to borrow quickly in order to bridge cash needs. Needless to say, taking out such loans requires banks to pay interest as well as provide good-quality collateral to secure the debt.

Firms, therefore, have every incentive to figure out ways to reduce the pressure on their pocketbook. This can mean trying tactics like gaming when payments are submitted in order to limit daily cash needs. For example, a bank that delays submitting payments for settlement from morning to later in the day increases its odds that it receives money from others in the form of payments. This inflow of cash from others can refresh a bank’s private cash supplies. The bank obviously also bets that others will not think the same way. The incentive for self-preservation within real-time gross settlement systems can raise concerns about banks all delaying payments and creating possible choke-points during the day as they clamor to fulfill their payment needs while also trying to minimize the costs involved. Tellingly, policies to infuse the banking system with cash following the 2008 Financial Crisis appear to have the unintended consequence of speeding up the processing of such real-time payments. Having found themselves holding deeper reserves of cash in master accounts, banks have had less need to worry about the need for bridge loans and collateral – and can send out payments at a more even tempo throughout the day.

**Net Settlement Systems**

In contrast to real-time gross settlement, banks can clear and settle under a model that performs settlement on a net basis. Netting requires banks to first share messages and to then calculate any offsetting obligations that they have to one another. If Bank A plans to send a transfer of $100 to Bank B for a customer – and Bank B has a customer looking to send $70 to one of Bank A’s clients, the net sum that must be transferred is just $30 from Bank A to Bank B. Whereas a real-time gross settlement system demands that both Bank A and Bank B transfer the full $100 and $70 respectively, a system based on netting is more forgiving. At least from the cash management side, it means that banks can operate with a smaller pot of their own money. This reduces the need for potentially expensive bridge loans and high-quality collateral.

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80 Bech & Garratt, *supra* note [359].
80 See, e.g., Kahn, McAndrews & Roberds, *supra* note [364](highlighting the economic cost savings, such as in relation to reduced collateral demands).
But this model, too, comes with serious shortcomings. First, it is not as fast – and this is by design. Netting needs time. To calculate offsetting exposures, parties need to pool a set of transactions and then work out who owes what and to whom. This requires the system to first batch payment instructions during clearing. Once a set is collected, clearing requires analysis of overall and net exposures before sending instructions to banks to settle net sums owed to one another.  

In addition, this process comes with the danger that one or other bank might fail in the period of time it takes for payments to net-out and be settled, resulting in incomplete transactions and cascading uncertainty for others within the system. In other words, the system comes with credit risk – or, the threat that one entity’s default imperils the workings of the larger system. For example, Bank A sends a payment of $100 to Bank B at 2:00pm and Bank B has to transmit $30 to Bank A at 3:00pm – meaning that Bank A ends up owing Bank B $70 on a net basis. Because netting needs multiple claims to be pooled before a net obligation can be calculated, it requires that the system wait for payment orders to accumulate before batching them and then figuring out who owes what to whom. In this example, if the ACH network performs a regular batching at, say, 3:30pm, there is a risk that Bank A might collapse in the afternoon around 3pm, such that its obligation to pay $70 to Bank B ends up in limbo. Because Bank B might struggle to get its $70 on time, it can face pressure on its own ability to make payments to others in the ACH network, resulting in a spiraling crisis across the system as a whole. Because a netting-based system has to run with a certain amount of lag-time, it means that there is room for crisis to strike in these gaps and for other scheme participants and their customer payments to come under severe strain and uncertainty.

Credit Card Networks

Card networks – such as Visa or Mastercard – depend heavily on the interbank payment settlement infrastructure provided by Fedwire and the ACH network. It is worth briefly highlighting why. The technicalities of payment card settlement are notoriously complex and esoteric; however, by way of brief summary, the payment card transaction centers around interaction between five parties:

- The customer
- The customer’s bank (the bank that issues the card)
- The business where the customer shops
- The business’ sponsoring bank in the payment card network
- The payment card network that sets the rules for the scheme and processes essential transaction information.

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368 Federal Reserve, Clearing and Settlement, supra note [354](detailing the higher credit risk within net settlement systems).
In a network like Visa or Mastercard, customers and merchants are generally backed by a sponsoring bank — either the institution that issues the card to the customer, or a sponsoring bank for a particular business. The first step is straight-forward. Once the customer swipes the card, the payment card network first verifies basic details about the card’s validity, whether the card has reached it spending limit, any possible risks of fraud and whether the buyer’s account remains open and usable. Using electronic communication networks and digital terminals, such information transfers now happen rapidly at point-of-sale.

Then, however, a series of complex interactions follow. Once the transaction is approved, the customer is supposed to be paying (in borrowed money if using a credit card). This fact, by itself, should make a seller extremely uncomfortable without further assurance. In order to provide this comfort, the seller’s bank within the network promises to pay the merchant for the value of the transaction (minus fees). Having made this promise, the seller’s bank communicates with the buyer’s bank in order to get the buyer’s institution to pay the seller’s bank for the value of the sale (again, minus fees). Finally, the buyer’s bank is left holding the risk — again if a credit card is used or if overdraft is included with a debit card — and the buyer is then supposed to eventually pay their bank for all the liabilities that they owe.

Payment card networks provide the communication and processing power that collects information from merchants and customers, tally it up, and regularly inform participating banks how much they owe to one another. While the granular details are obviously far more complex than set out here, the basic outline is a familiar one. In providing clearing of transactions on the network, credit card companies collect data on transactions, batch them, perform checks, determine offsets and net balances and then require participating banks to ensure that sums owed to actors within the network (and also to the card companies) are paid. Settlement rules stipulated by the card companies require that monies be transferred using Fedwire to reach different banks and the bank servicing the credit card company. In some cases, the credit card network permits use of the ACH network in case a participating bank is not a member of Fedwire. In all, settlement within payment card networks takes around one to two business days. Crucially, there is one additional segment where recourse to core payment rails is needed: when a credit card customer has to pay the debt owed on the card to their bank. In this context, the customer may use an ACH network (e.g., direct payment to the bank issuing the card). A customer might also send a check. Timings for settlement depend on the usual lags embedded within ACH and check processing.

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370 Herbst-Murphy, supra note [369], 1.
372 For a fuller description of the detailed processes that underlie the various stages of clearing and settlement within credit card networks, see generally, Herbst-Murphy, supra note [369].
Remittances

Remittances generally involve people in one country sending money back to family and friends in another. This method of payment is common among immigrant communities where those coming to work in one country send money back to loved ones at home. Remittances payment providers have to navigate complex international banking systems in order to ensure money can be transferred from one country to another. For example, a remittance service receives $200 from a U.S. based customer who wants to send the money to their family in Kingston, Jamaica. The customer initiates the transfer using a payment card. Once the customer’s payment card is swiped, the remitter can instruct its partner bank – Big Bank – to begin a transfer of $200 to the destination bank in Kingston. Because Big Bank is global, it just so happens that it has a branch in Kingston. If the receiver’s account is at the Kingston branch of Big Bank, then the transaction can proceed very smoothly. Big Bank will debit the remitter’s account and credit the receiver’s account on its own books. Such a transaction should happen quickly because the steps involved are few and simple. Alternatively, the recipient’s account might be at another Jamaican Bank. Both Big Bank’s branch and Jamaican Bank are a member of a national payment settlement service in Jamaica. In such a situation, using the national settlement service, money can be debited from Big Bank’s account and credited to Jamaican Bank’s account. The transaction might move more slowly than in the first scenario – there are more steps involved – but it still offers a relatively straightforward way for money to move from one place to the next.

But things can become more complicated. The customer asks to send $200 to another family member who lives in a small town in the Argentinian countryside – and where there is only One Bank from which the money can be collected. The path from Big Bank to One Bank is a longer one and requires the use of a “correspondent bank” that acts as a logistical pit-stop on the journey. To deal with this situation, Big Bank contacts Main Bank in Argentina with which it has an account. Big Bank knows that One Bank also has an account with Main Bank. Main Bank, then, becomes a correspondent bank that debits money from the account it holds for Big Bank, and it credits One Bank’s account with the equivalent of $200 in Argentine Pesos. In this scenario, the remitter and Big Bank have high search costs to find a correspondent bank. They have to deal with fees that may be charged along the way, in addition to foreign exchange conversion fees from USD to Pesos. The time to settlement might be as much as three to five days, maybe longer.

Recognizing these challenges, remitters like Western Union have developed a closed network of entities that operate by debiting and crediting user accounts within their internal loop as a way to make money move faster. Imagine a customer that comes to the remitter’s branch in Los Angeles, opens an account and funds it with $200 in cash. The customer asks for the $200 to be sent to Mumbai, India, where the recipient family member will collect the funds from the remitter’s office. In this situation, the remitter can accept the money at its Los Angeles office and to then instruct its Mumbai branch to make the $200 available in Mumbai in Indian Rupees (INR) as soon as it can.
The remitter will have to internally reconcile the accounts of its Los Angeles and Mumbai operations eventually, debiting $200 from its U.S. dollar account and crediting it to an INR account. But this network-centric service can provide customers with money more quickly. The transfer still might not be instantaneous. There may be regulatory barriers that require checks on who is sending and receiving the money and why. But it offers a far quicker solution where the remitter simply credits and debits accounts across an organizational ledger, rather than waiting to work through a series of correspondent banks.

Checks

Checks are perhaps the most commonly used payment methods. A check-book represents an instrument that transfers a portion of the payor’s claim against their bank to a third party. By handing over a check leaf to their own bank, the payee lodges a claim and initiates the process of collection. In the past, a payer’s bank would ship paper checks to a regional Federal Reserve bank for verification; the Fed would then credit the account of the payee bank and debit the account of the payor’s bank. Since 2004, banks have transmitted images of the front and back of checks electronically for verification by the Fed (or by another clearing service, or even by the payor’s bank itself). This innovation, paired with smartphone-based submission, has considerably shortened the time it takes for a check to clear. Even so, a payee often must wait 1-5 business days for their money, while, for example, the payee’s bank conducts verifications. A bank might hold some of the funds for a time, while making a small amount available for rapid use.374

Travelers’ Checks

Travelers’ checks are a longstanding payment method designed to address payment issues confronting travelers, including currency changes, unpredictable bank fees, and the threat of theft. A travelers’ check permits a customer to “buy” a general authority from its bank to spend a certain, pre-agreed amount of money.375 When the bank issues the check, it decreases its liability owed to the customer by that amount. In return, the customer can travel with an instrument representing this sum and spend the check, almost like cash, wherever it is accepted. Travelers’ checks provide strong assurance to merchants that they are valid and reliable. Unlike cash, they are portable, secure, and protected against loss and theft.


375 Sometimes, travelers’ checks may also be purchased from another type of financial institution, like a credit card company (e.g., American Express, Visa, Mastercard).
But travelers’ checks have faded from use in the digital age. They require time and effort to formalize. Merchants must check the customer’s signature, counter-sign, write down identifying details of the check by hand, and risk delays in extracting cash value depending on how efficiently local banks can turn checks into cash—eroding the willingness of payees to accept them. They often generate high fees for customers—and the attraction of protection is eroded by the complicated procedural hurdles customers must navigate to get a lost check canceled and a new one issued.\footnote{Lisa Fritscher, \textit{Disadvantages of Traveler’s Checks When Traveling}, USA Today, \url{https://traveltips.usatoday.com/disadvantages-travelers-checks-traveling-108262.html}.}

\textit{Direct Payments}

Direct payment allows a bank customer to give a payee authority to request money from a payor’s bank independently, without requiring the payer to intervene first, directly adjusting the liabilities owed by the payer’s bank to its customer.\footnote{See, e.g., 12 CFR § 205.10 (a).} In the U.S., retail-based direct payments are generally processed and settled using the Automated Clearing House (ACH) network, a scheme where banks connect with one another, with the help of the Fed, to send and receive payments on behalf of customers.\footnote{NACHA, \textit{What is ACH?} \url{https://www.nacha.org/content/what-is-ach}.}

This suppleness to confer authority enhances the utility of the payment system for everyday interactions. Instead of having to remember to pay a bill each month, a payor creates a general authority at their bank that lets a given payee seek out payment itself. This facility creates efficiencies within the larger economy: it better ensures that bills are paid on time. Consumers are spared the cost and distress of late payment charges, debt collection and adverse effects on credit scores. More predictable payment streams can motivate businesses to deliver services without bundling in additional costs to account for the higher risks of missed and late payments. Parties do not have to worry about lost paper checks or about holds on funds. This predictability boosts efficiencies for money management: payors and payees know exactly when funds will be debited/credited and can plan their budgets accordingly.

But direct payments also come with problems. Because they need authorization to set up, they also require a process to unwind (e.g., when moving house or changing a utility supplier). Payors face challenges in ensuring that their bank properly honors their instructions to stop future payment.\footnote{Jane Larimer, Alaina Gimbert, Tim Thorson & Gary Stein, \textit{Regulation E and Stop Payment Rights} (2014).} Customers may not understand their right to cancel future payments or the steps they need to take to do so. These difficulties have forced costs on people vulnerable to being preyed on by opportunistic entities that rely on delays and confusing formalities to ensure hefty payments for themselves even where they have no right to funds.\footnote{New York State Department of Financial Services, \textit{NACHA’s Proposed Reforms Do Not Go Far Enough and Leave New Yorkers Vulnerable to Illegal, Predatory Payday Lending}, Press Release (Jan. 14, 2014), \url{https://www.dfs.ny.gov/reports_and_publications/press_releases/pr1401141} (noting that payer banks’ were sometimes not honoring customer requests to stop payments to usurious payday lenders).}
All of these payment types, then, come with trade-offs. Complex formalities, slowness, limited convenience, and clunky customer interfaces impose costs on their use and effectiveness – and point to a need for further innovation to improve efficiencies within payment systems.