



RESEARCH & ANALYSIS

Money and Payments: The U.S. Dollar in the Age of Digital Transformation

Summary of Public Comments

April 2023



BOARD OF GOVERNORS OF THE
FEDERAL RESERVE SYSTEM



The Federal Reserve System is the central bank of the United States. It performs five key functions to promote the effective operation of the U.S. economy and, more generally, the public interest.

The Federal Reserve

- **conducts the nation's monetary policy** to promote maximum employment and stable prices in the U.S. economy;
- **promotes the stability of the financial system** and seeks to minimize and contain systemic risks through active monitoring and engagement in the U.S. and abroad;
- **promotes the safety and soundness of individual financial institutions** and monitors their impact on the financial system as a whole;
- **fosters payment and settlement system safety and efficiency** through services to the banking industry and U.S. government that facilitate U.S.-dollar transactions and payments; and
- **promotes consumer protection and community development** through consumer-focused supervision and examination, research and analysis of emerging consumer issues and trends, community economic development activities, and administration of consumer laws and regulations.

To learn more about us, visit www.federalreserve.gov/aboutthefed.htm.

Contents

Overview	1
Purpose and Scope of Summary	1
Key Statistics	3
Summary of Responses by Topic	4
Potential Benefits, Risks, and Policy Considerations	4
Alternatives to Achieve Potential Benefits	10
Other Considerations Raised	11
Design Choices	12
Ongoing Work and Next Steps	16
Appendix A: Background	17
Appendix B: Questions Posed in Money and Payments Paper	18
CBDC Benefits, Risks, and Policy Considerations	18
CBDC Design	19

Overview

In January 2022, the Federal Reserve issued a discussion paper, [Money and Payments: The U.S. Dollar in the Age of Digital Transformation](#) (“*Money and Payments*”) as a first step in fostering a broad and transparent public dialogue about central bank digital currencies (CBDCs) in general, and about the potential benefits and risks of a U.S. CBDC in particular.¹ The paper

- summarized the current state of the domestic payments system;
- discussed the different types of digital payment methods and assets, including stablecoins;
- offered four attributes for a potential U.S. CBDC, if one were created, that would best serve the needs of the United States informed by analysis to date: 1) privacy-protected, 2) intermediated, 3) widely transferable, and 4) identity-verified;²
- provided an overview of potential benefits, risks, and policy considerations of a U.S. CBDC; and
- concluded with 22 questions for public comment related to the potential benefits, risks, design choices, and other considerations of a U.S. CBDC.³

The Federal Reserve Board has not made any decisions regarding the issuance of a U.S. CBDC. The Federal Reserve has made no decision on issuing a CBDC and would only proceed with the issuance of a CBDC with an authorizing law.

Purpose and Scope of Summary

This report summarizes the comment submissions received in response to the 22 questions posed in the *Money and Payments* paper.⁴ This summary does not attempt to cover every point raised by commenters. Instead, the summary is organized around the topical areas referenced in the questions and highlights benefits, risks, or other considerations raised by multiple commenters.⁵

¹ The paper defined CBDC as a digital liability of the Federal Reserve that is widely available to the general public. See Board of Governors of the Federal Reserve System, *Money and Payments: The U.S. Dollar in the Age of Digital Transformation* (Washington: Board of Governors, January 2022), <https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf>. See [appendix A](#) for additional background.

² Potential intermediaries could include commercial banks and regulated nonbank financial service providers and would operate in an open market for CBDC services. An intermediated system, in which private intermediaries, including banks, would offer accounts or digital wallets to facilitate the management of CBDC, could leverage the private sector's existing identity frameworks.

³ Comments were accepted for 120 days, with the comment period closing on May 20, 2022. While submissions received after May 20, 2022, were reviewed, they are not reflected as part of the formal comment period and summary.

⁴ See [appendix B](#).

⁵ For public comments, please see the Federal Reserve Board's website at <https://www.federalreserve.gov/cbdc-public-comments.htm>. All public questions and comments on the *Money and Payments: The U.S. Dollar in the Age of Digital Transformation* discussion paper, however they were submitted (i.e., electronically or in paper form), are made available publicly (including by posting on the Board's website). Questions and comments are not edited for public viewing but are reproduced as submitted. However, the Board reserves the ability to redact information when necessary for technical

This summary of public comments does not represent an endorsement of any views by the Federal Reserve. Rather, the views of commenters are presented without taking a position regarding their input. Their [full submissions](#) remain available to the public.

Key Statistics

The Federal Reserve received 2,050 comment submissions. Submissions were received from all 50 states and some U.S. territories.⁶

Commenters represented a wide array of segments, including financial institutions, technology companies, trade organizations, consumer groups, congressional representatives, and individual private citizens (“individuals”). Individuals made up the largest self-reported group, followed by technology companies, academics, and financial institutions. These numbers are reported as received.

Self-reported segment	Count
Individual	1,057
Other	292
No industry reported ¹	183
Technology company	159
Academia	100
Financial institutions, all	93
Bank, large	51
Bank, small or midsize	23
Credit union	19
Merchant	55
Trade organization	51
Consumer group	32
Payment system operator or service provider	28
¹ Includes email submissions.	

⁶ The total submission count includes blank submissions and duplicate submissions. Multiple modes were available for submitting comments, including web form, email, and physical mail. Some commenters submitted their responses via email and via the web form. Other commenters submitted their responses more than once via the web form. Demographic information, including segment and geographic data, was self-reported and was not required for submission. Additionally, commenters were not required to provide a response to every question.

Summary of Responses by Topic

The Federal Reserve posed a range of questions on the potential benefits, risks, policy considerations, and design choices for a U.S. CBDC. In some cases, aspects of a U.S. CBDC that were cited as potential benefits by some commenters were also cited as potential risks or disadvantages by other commenters (and vice versa), reflecting the wide range of views on the substantive issues.

Potential Benefits, Risks, and Policy Considerations

Safely Meet Future Needs and Demands for Payment Services

Commenters had diverse views about whether a CBDC would help safely meet future payment system needs. Some commenters, including some representing merchants, saw the potential of CBDC to drive efficiency in the payment system through modernization and increased competition, which could lower costs for merchants and smaller providers.

Some commenters representing some payment service providers, technology companies, and academics highlighted the potential for a CBDC to support new payment services, including programmable functionality (such as automated payments when specific conditions are met) and offline capabilities. Commenters highlighted the ability of programmable functionality to create a foundation for new and emerging business models.⁷

Commenters also noted external developments that could strengthen the case for issuing a U.S. CBDC. For example, if other jurisdictions were to issue CBDCs, the absence of a U.S. CBDC could limit cross-border interoperability.

Commenters across segments noted that CBDC may not be the best method for addressing the needs of the future financial system. Some commenters, including some financial institutions, noted that the tokenization of commercial bank deposits could achieve some of these goals. Other commenters, including some technology and payments companies and individuals, highlighted in particular the potential of well-regulated stablecoins as a path to achieve some of the potential benefits of a CBDC, such as improved cross-border payments and financial inclusion, with fewer risks such as government expense and concerns about government intrusion and individual privacy. Some commenters representing financial institutions noted that properly regulated stable-

⁷ For additional perspective on programmable money, see Alexander Lee, “What Is Programmable Money?” FEDS Notes (Washington: Board of Governors of the Federal Reserve System, June 2021), <https://www.federalreserve.gov/econres/notes/feds-notes/what-is-programmable-money-20210623.html>.

coins could mitigate some of the risks seen today in the crypto-asset space, such as lack of transparency and consumer protection.

Some commenters from technology and payments companies acknowledged that digital assets such as stablecoins and a CBDC could coexist with, and potentially complement, each other by leveraging different features to serve different market needs.

Improvements to Cross-Border Payments

Commenters noted a variety of international considerations for a U.S. CBDC, including the potential impact on cross-border payments. Commenters, including some technology companies, suggested that CBDC could improve cross-border payments by increasing competition. Others saw a wholesale CBDC as a viable alternative to improving cross-border payments that could have fewer risks than a retail CBDC, such as disintermediation of traditional financial institutions.⁸

Several commenters, including some technology companies and financial institutions, argued that cross-jurisdictional interoperability on both technology and legal frameworks would be important for unlocking potential benefits for cross-border payments but would also be difficult to achieve. Some commenters, including some individuals, believed that private-sector innovation is adequately addressing the current frictions with cross-border payments, and therefore a CBDC is not needed in this context.

Support the Dollar's International Role

Commenters across segments recognized the benefits of the dollar's dominant international role. The dollar is the world's most widely used currency for payments and investments; it also serves as the world's reserve currency. The dollar's international role benefits the United States by, among other things, lowering transaction and borrowing costs for U.S. households, businesses, and government. The dollar's international role also allows the United States to influence standards for the global monetary system.

Commenters expressed a range of views on whether a CBDC would support the international role of the dollar. Some commenters, including some individuals and trade organizations, saw the potential for a CBDC to support this role—for example, if a CBDC were more efficient, stable, or privacy-protected than alternatives. Commenters also expressed concern that CBDCs issued by other jurisdictions could undermine the role of the dollar if the United States did not issue a CBDC. Commenters, including some technology companies and financial institutions, saw the

⁸ CBDC is sometimes referred to by intended uses: wholesale and retail. A wholesale CBDC generally refers to a CBDC with a narrower use case, such as one designed primarily for large-value institutional payments and not widely available to the general public. A retail CBDC generally refers to a CBDC that is widely available to the public for day-to-day use in personal and commercial transactions. The *Money and Payments* paper focuses on a “general-purpose” CBDC that could serve a variety of uses.

issuance of a CBDC as a potential way to ensure that the United States leads the development of international standards for cross-border payments using CBDCs, which could support the dominant international role of the dollar.

Other commenters, including some individuals, did not think a CBDC would have a significant impact on the international role of the dollar, suggesting other factors that could be more relevant, including the stability of a currency, the depth and liquidity of U.S. financial markets, the size and openness of the U.S. economy, and international trust in U.S. institutions and rule of law. A number of commenters, including some individuals and technology companies, suggested private-sector solutions, including solutions based on distributed ledger technology (DLT), as alternative methods to support the international role of the dollar.⁹

Financial Inclusion

Commenters expressed a range of views on how a CBDC might affect financial inclusion.¹⁰ Some commenters, including some academics, speculated that a CBDC could improve certainty around financial transactions, which may support increased adoption of financial services. Others saw the potential for a CBDC to lower overall costs, making financial services more affordable and accessible.

Commenters, including some academics and technology companies, suggested design features of a CBDC that could improve financial inclusion, including offline capabilities, no minimum balance requirements, protection of user privacy, provision of multiple endpoint access (i.e., enabling CBDC to be accessed by consumers and businesses in multiple ways, such as prepaid cards and smartphones), allowance for low-cost conversion to physical cash, and inclusion of nonbank intermediaries. Other commenters suggested alternative methods to increase financial inclusion such as low-fee bank accounts, which they suggested could be supported by subsidies and mandates.

Conversely, many commenters expressed concern that a CBDC's net effect on financial inclusion could range from neutral to negative. Commenters, including some individuals, academics, and technology companies, worried that a CBDC could widen the “digital divide,” particularly for elderly and low-income individuals who may lack reliable internet and phone access.¹¹ Moreover, some commenters representing consumer groups questioned whether a CBDC could adequately address the reasons that consumers remain outside the formal financial system today, including issues

⁹ For additional information on DLT, see David Mills, et al., “Distributed Ledger Technology in Payments, Clearing, and Settlement,” Finance and Economics Discussion Series 2016-095 (Washington: Board of Governors of the Federal Reserve System, December 2016), <https://doi.org/10.17016/FEDS.2016.095>.

¹⁰ The World Bank defines financial inclusion as access by individuals and businesses to useful and affordable financial products and services that meet their needs—transactions, payments, savings, credit, and insurance—delivered in a responsible and sustainable way. See The World Bank Group, “Financial Inclusion, Overview,” web page (Washington: The World Bank Group, March 2022), <https://www.worldbank.org/en/topic/financialinclusion/overview>.

¹¹ For additional information on internet and phone access, see Pew Research Center, “Mobile Fact Sheet” (Washington: Pew Research Center, April 2021), <https://www.pewresearch.org/internet/fact-sheet/mobile/>.

related to trust, minimum balance requirements, and costs associated with maintaining accounts.¹² Furthermore, some commenters, including some individuals, believed that a CBDC could exacerbate existing concerns about privacy and mistrust of the government. Some commenters, including some community banks, credit unions, and consumer groups, noted that a CBDC could reduce the public's access to credit, including for the most vulnerable consumers and small businesses.

Some individuals and financial institutions believed financial inclusion goals could be better achieved through upgrades to existing payment systems and infrastructure, as well as facilitating private-sector innovation and competition in payments. Other commenters suggested that alternative methods to increase financial inclusion such as low-fee bank accounts, which they suggested could be supported by subsidies and mandates, were superior. The Bank On coalitions were also noted as an alternative.¹³

Additionally, some commenters noted that education, financial literacy, and digital literacy were key barriers to financial inclusion and should be addressed regardless of whether a CBDC is introduced.

Extend Public Access to Safe Central Bank Money

Some commenters expressed support for a digital form of central bank money if the use of cash, the only central bank money that is available to the general public, were to decline. Conversely, a number of commenters, including some individuals, noted that while a CBDC would have no credit or liquidity risk (similar to other forms of central bank money), commercial bank money supported by federal deposit insurance is generally perceived by consumers to have the same benefits. Additionally, some commenters, including some individuals and consumer groups, saw protections for cash use as a higher priority than a digital form of central bank money.

Changes to Financial Sector Market Structure

Commenters discussed how CBDC could change the structure of the U.S. financial system, altering the roles and responsibilities of the private sector and the central bank. Many commenters, including some financial institutions, argued that the issuance of a CBDC could shift deposits out of commercial banks, potentially reducing the availability of and raising the cost of credit. Several commenters, including some financial institutions, also expressed concern that intermediaries might be expected to cover operational, cybersecurity, and compliance costs of a CBDC.

¹² Federal Deposit Insurance Corporation, "2021 FDIC National Survey of Unbanked and Underbanked Households" (Washington: FDIC, November 2022), <https://www.fdic.gov/analysis/household-survey/2021report.pdf>.

¹³ Bank On coalitions are local partnerships between government agencies, financial institutions, and community organizations that work together to improve the financial stability of unbanked and underbanked residents in their communities. See the Cities for Financial Empowerment Fund website at <https://cfefund.org/project/bank-on/>.

Commenters, including some financial institutions and consumer groups, raised concerns that the costs of CBDC could threaten financial institutions, and in particular smaller financial institutions, which often provide financial services for underserved consumers including rural consumers and small businesses.¹⁴ Commenters, including some financial institutions, also raised concerns that reduced availability to credit could slow economic growth. Commenters, including some trade groups, also expressed concern that a CBDC could discourage new entrants and competition in payments. Commenters, including some financial institutions and payments companies, suggested methods to offset the potential higher costs to financial institutions from the introduction of a CBDC, including supplemental funding.

Safety and Stability of the Financial System

Commenters highlighted potential risks and benefits to the safety and stability of the financial system from the introduction of a CBDC. Some commenters, including some individuals and financial institutions, argued that a consumer flight to the safety of a CBDC during periods of market stress could have destabilizing effects on the broader banking and financial system. However, some commenters, including some trade groups, argued that an ex ante migration from other riskier assets into a CBDC could limit the impact or reduce the likelihood of future runs and strengthen the resilience of financial markets. Additional potential risks to financial stability, such as the inclusion of less-regulated nonbank firms in the CBDC intermediation system, were also noted by some commenters.

Several commenters, including some representing financial institutions and technology companies, suggested alternatives to CBDC that they thought could present fewer risks to the existing financial system, such as well-regulated private-sector solutions. Other commenters believed that the introduction of a CBDC could be perceived as legitimizing the crypto-asset industry.

Efficacy of Monetary Policy Implementation

Some commenters, including some academics and technology companies, argued that a CBDC could give the Federal Reserve real-time data on the economy and provide more direct interaction between the Federal Reserve and consumers, leading to the potential for more informed policy decisions and effective policy implementation. Other commenters, including some payments companies, highlighted that not issuing a CBDC could affect the strength of the Federal Reserve's policy tools if stablecoins and other digital assets were to become widely used as a means of payment.

¹⁴ Commenters highlighted that according to the Independent Community Bankers Association (ICBA), community banks provide 60 percent of all small business loans and make more than 80 percent of agricultural loans. See the ICBA website at <https://www.icba.org/about/community-banking>.

Commenters, including some academics, also expressed concerns that a CBDC could create challenges for monetary policy implementation, including by changing the composition of the Federal Reserve balance sheet, influencing the money supply, and introducing another policy rate (for example, interest rate) if the CBDC were interest bearing. Other commenters highlighted that a CBDC could alter the structure of the financial system (for example, drawing funds from bank deposits), which is the main sector through which the Federal Reserve transmits monetary policy.

Some commenters felt that the concerns and benefits are overstated and a CBDC would simply be a new part of the money supply, similar to physical currency, with no further changes to policy implementation or changes to the Federal Reserve's current reach.

Privacy and Data Protection and the Prevention of Financial Crimes

Commenters, including some individuals, expressed strong concerns about how user data would be protected from unauthorized surveillance and monetization if a CBDC were to be implemented. Several commenters noted that insufficient privacy protections could discourage adoption of a CBDC.

Further to the privacy topic, some commenters representing payments and technology companies suggested ways in which consumer privacy could be maximized while preventing illicit activity. Some speculated that a blockchain-based system could provide sufficient traceability and privacy. Technical solutions were also suggested. Other commenters suggested a greater exploration of wholesale CBDC to counteract some of the risks of a retail CBDC, including individual privacy risks.

Conversely, some commenters highlighted the potential of a CBDC to promote transparency and reduce illicit activity. Additionally, commenters, including some consumer groups, highlighted that privacy concerns are not unique to CBDC, and additional privacy protections for existing types of digital payments may be warranted. Furthermore, some commenters noted that without proper protections, intermediaries may collect and sell user data.

Operational Resilience and Cybersecurity

Operational resilience and cybersecurity were frequently cited concerns from commenters, including individuals. Many expressed concerns that a large, centralized CBDC payment system could be a target for malicious actors. Other commenters noted that operational and cybersecurity risks may also vary among intermediaries, which may mean that strict security requirements for participation would be needed. Previously mentioned technical and policy solutions to protect user privacy were also noted as ways to reduce the amount of personal data held in the system.

Several commenters also noted that there may be tradeoffs between certain design choices and system security. For example, some commenters speculated that while offline capability (i.e., enabling some payments to be made without internet access) could increase resilience and availability, it could also increase risks of double-spending or other illicit activity.

Other commenters, including some technology companies, noted that a greater diversity of service providers and additional decentralization could enhance resilience of the CBDC system.

Alternatives to Achieve Potential Benefits

Modernization of the Existing Payment System, Including the FedNowsm Service

Several commenters, including some financial institutions, believe that the potential benefits of a CBDC could be better achieved through updates to the existing payments infrastructure. Some financial institutions that commented on the paper supported the Federal Reserve's upcoming FedNow Service and its ability to achieve these benefits.¹⁵ Furthermore, some commenters, including some financial institutions, believed it is important to understand the impact of the FedNow Service before pursuing a CBDC.

Wholesale-Only CBDC

Some commenters, including some individuals, technology companies, and financial institutions, suggested that a wholesale CBDC could achieve a narrower set of benefits, such as improving cross-border payments and supporting the dollar's international role, without creating broader risks such as disintermediation of the financial sector and risks to individual privacy. Some suggested that a wholesale CBDC could be an initial step towards a retail CBDC.

Well-Regulated Private-Sector Innovations

Some commenters, including some payments companies and trade organizations, believe that the Federal Reserve should promote private-sector innovation by bringing new forms of digital assets, including stablecoins, under a clear regulatory framework and ensuring appropriate protections are in place. Commenters highlighted the potential for properly regulated stablecoins, in addition to planned and existing improvements in the payment system, to achieve the purported benefits of a CBDC.¹⁶

¹⁵ The FedNow Service will be available to depository institutions in the United States and is intended to be a flexible, neutral platform that supports a broad variety of instant payments. At the most fundamental level, the service will provide interbank clearing and settlement that enables funds to be transferred from the account of a sender to the account of a receiver in near real-time and at any time, any day of the year. Depository institutions and their service providers will be able to build on this fundamental capability to offer value-added services to their customers. The FedNow Service will be designed to maintain uninterrupted 24x7x365 processing with security features to support payment integrity and data security. The target release date for the service is May to July 2023.

¹⁶ Commenters pointed to several planned and existing improvements in the payment system such as the upcoming FedNow Service, the ISO 20022 messaging standard, mobile banking, and peer-to-peer payments.

Commenters expressed the importance of public–private partnerships and collaboration to achieve improvements in the payment system. Multiple commenters stated that it remains unclear how a CBDC would deliver a faster, more efficient, and less expensive solution than current market developments in payments.

Updated Laws and Regulation

Several commenters, including some financial institutions that commented on the paper, argued that updated laws and regulation could achieve many of the potential benefits of CBDC listed in the *Money and Payments* paper, such as financial inclusion and increased payment system efficiency. Specifically, some commenters, including some financial institutions, argued that current regulations to prevent illicit finance may disincentivize financial institutions to provide services to some customers, and a review of these regulations could improve financial inclusion. Other commenters believed additional, clear regulation could support private-sector innovation and promote a more robust and dynamic financial system.

Other Considerations Raised

Roles of Government

Concerns that a CBDC could enable too much government control of and visibility into payments was a frequently cited concern, particularly from individuals. Many commenters, including some individuals and consumer groups, expressed concerns that a CBDC could allow the government too much access to user data. A number of individuals stated that privacy properties of physical cash should be replicated in a CBDC to the maximum extent possible, arguing for anonymity and non-traceability of transactions.

Some commenters, including some individuals, academics, and consumer groups, worried that a programmable CBDC could be used to impose political limitations on spending by private citizens or firms—for example, if it could enable restrictions on where government benefits could be spent or restrict payments to certain groups. Other commenters, including some from trade organizations and technology companies, also expressed concern that political pressures on design choices, including limits on holdings and transaction sizes as well as whether the CBDC is interest bearing, could pose challenges to the Federal Reserve’s political independence. Commenters argued these challenges could undermine public trust of the government, including the Federal Reserve.

Preserving Consumer Protections

Commenters, including some consumer groups, highlighted consumer-protection rules that should apply in a CBDC system and the existing financial system. For example, some commenters voiced concern that real-time digital payments can enable payments fraud at a greater scale and velocity.

Commenters also highlighted fraud and other consumer-protection risks in new and unregulated financial technologies, such as cryptocurrencies and stablecoins.

Commenters suggested ways to address these issues, such as regulatory clarity and fraud-protection programs. Commenters, including some representing consumer groups, emphasized that the application of both state and federal consumer protection laws should extend to both CBDC and intermediaries.

Expense and Need for Defined Use Case

Some commenters, including some individuals and financial institutions, did not think the potential benefits of a CBDC warranted a potentially large expenditure of funds by the public and private sectors to implement a CBDC. In addition, some commenters, including some financial institutions, noted that an intermediated CBDC could place a significant cost burden on intermediaries to distribute it. Potentially less expensive solutions, generally from the private sector, were suggested by some commenters.

Commenters across segments expressed the desire for a clear use case or defined problem that a CBDC would solve to fully contemplate the specific benefits, risks, and design choices of a potential CBDC.

Digital Identity

Several commenters, including some trade groups and academics, highlighted that digital identity infrastructure could support an identity-verified CBDC.¹⁷ Additionally, commenters, including some academics, highlighted the potential for a digital and/or public identity infrastructure to improve financial inclusion.¹⁸ For example, commenters argued a robust digital identity system could help lower barriers to financial services and expand options for access.

Design Choices

Commenters noted that particular design choices, explored in more detail below, could support potential benefits of a CBDC and mitigate some of the risks.

Commenters across segments highlighted that the potential benefits of a CBDC would be highly dependent on specific design choices that were implemented. Furthermore, many commenters

¹⁷ Digital identity generally refers to a set of electronically captured and stored attributes and/or credentials that uniquely identify a person.

¹⁸ According to a recent FDIC survey of the unbanked, personal identification problems were cited by 11.6 percent of participants as reasons for not having a bank account. See Federal Deposit Insurance Corporation, *2021 FDIC National Survey of Unbanked and Underbanked Households*, November 2022, <https://www.fdic.gov/analysis/household-survey/2021report.pdf>.

wanted more information on the design choices or models that are being contemplated in order to provide an informed view on the benefits, risks, and tradeoffs.

Pay Interest

Commenters presented a range of views on whether a CBDC should pay interest to users. Many commenters, including some financial institutions, noted that a non-interest-bearing CBDC could pose less risk of disruptive bank deposit substitution and may be more likely to be used as a payment instrument. Additionally, some commenters argued that a digital cash instrument or risk-free asset should not bear interest.

Conversely, other commenters, including some academics and trade organizations, argued that for a CBDC to achieve its potential benefits, it must be widely used and therefore should pay interest to encourage use. Of the commenters that supported an interest-bearing CBDC, many specified that the rate should be low.

Limits

Commenters presented a range of views on whether CBDC holdings should be subject to limits and what kinds of limits could be considered, such as value limits on holdings (including during times of financial stress), limits on transactions (such as number or value) within a given time period, and limits on holding periods. Many commenters who supported limits in some form saw them as a method to reduce the risk of disruptive deposit substitution. However, some commenters noted that strict enforcement of limits could require a method of identifying CBDC holders across intermediaries, which could raise privacy concerns. Some individuals expressed concerns that imposing holding or transactions limits on CBDC could be perceived as an overextension of the government's role.

Other commenters noted limits may be hard to enforce. Some commenters, including some representing merchants, highlighted that if limits were imposed, they may need to be different depending on the class of holder and associated use case—for example, individuals might be subject to different limits than businesses that accept CBDC for payment. Otherwise, a business could be prevented from accepting CBDC as payment if it hits its predetermined limit.

Intermediaries

Commenters offered a range of views on what types of firms should serve as intermediaries in a potential CBDC system and what the role and regulatory structure for these intermediaries should be. Some commenters, including some representing financial institutions and consumer groups, argued that only currently regulated financial institutions have the experience and supervision necessary to provide this function safely. Furthermore, some commenters worried that an intermediated model could impose costs related to cybersecurity, compliance, technology, and interoper-

ability, which could drive smaller financial institutions out of business. A number of commenters, including some financial institutions, suggested that nonbank intermediaries should be held to the same requirements, supervisory structure, and standards as currently regulated financial institutions if they were to become intermediaries in a CBDC system.

Some commenters, including some representing financial institutions, noted that an intermediation model that places significant costs on intermediaries without proper consumer protections may attract intermediaries with ulterior motives, such as profiting off user data.

However, many commenters, including some technology companies and payment service providers, supported using a variety of firms such as nonbank financial service providers and financial technology businesses, arguing these types of intermediaries could promote competition and innovation and reach additional segments of the population. Several commenters, including some financial institutions and consumer groups, suggested following the guidelines for access to Federal Reserve master accounts to determine eligibility and supervision requirements for intermediaries.¹⁹

Offline Capabilities

Commenters across segments supported an offline payments option to support operational resilience and enable usage by those without reliable access to the internet. Commenters, including some representing payments and technology companies, suggested a variety of methods for providing offline capabilities, including Bluetooth or near-field communication technology, offline counters that allow spending up to a certain threshold, and segregated accounts specifically for offline use, among other methods. Other commenters felt that offline capabilities should not be a top priority for a CBDC and noted that the consideration of offline payments should include a consideration of the level of risk tolerance for potentially fraudulent or illicit payments.

Ease of Use at Point of Sale and Interoperability

Many commenters agreed that if a CBDC were issued, it should be designed to maximize ease of use and acceptance at the point of sale. Wide transferability was noted as a key component of adoption and coexistence with the existing payment system.

Commenters expressed a range of views on how CBDC could be interoperable within existing systems. Some commenters, including some representing technology companies, suggested that a CBDC could act as a “base layer” that could be connected to existing payment networks and leverage mobile wallet technology, which could increase adoption and lower costs of implementa-

¹⁹ Board of Governors of the Federal Reserve System, “Guidelines for Evaluating Account and Services Requests” (Washington: Board of Governors, August 2022), <https://www.federalreserve.gov/newsevents/pressreleases/files/other20220815a1.pdf>.

tion. Others noted the importance of common standards for data and messaging, identity and authentication, security, and legal and regulatory frameworks.

The need for new technical standards was identified across a broad range of commenters, including academics, trade associations, and technology and payments companies. Additionally, some commenters, including some card networks, supported adoption of international standards and warned against adoption of unique standards and specifications that could be costly and inhibit interoperability and competition. However, some commenters, including some merchants and financial institutions, highlighted the potential high cost of modifying existing payment systems to achieve interoperability.

Additional Design Principles and Considerations

Several commenters, including some academics and technology companies, highlighted the importance of security considerations for a CBDC, particularly as technology continues to rapidly evolve. In particular, a number of commenters pointed to the risk of quantum computing and its potential future ability to break cryptographic keys.

Legal Tender Status

Commenters provided a wide range of views on the question of legal tender status. While some commenters agreed with the designation of CBDC as legal tender, in line with physical cash today, other commenters, including some retailers and trade associations, argued that it may not be necessary and noted that there are practical implications to this designation, such as acceptance at the point of sale, that would need to be considered.

Ongoing Work and Next Steps

The Federal Reserve continues to actively research and experiment with digital currencies and will continue to explore a wide range of design options for a CBDC. The work falls into four categories: technological experimentation, economic and policy research, stakeholder engagement and outreach, and international collaboration.²⁰

The *Money and Payments* paper and public comment period represent a first step in fostering a broad and transparent public dialogue about CBDC. Continued engagement with the public is critical to informing and advancing the Federal Reserve's policy research and technical experimentation related to CBDC. Therefore, the Federal Reserve is committed to hearing a broad and diverse range of voices on this important issue. Going forward, the Federal Reserve will continue to solicit feedback from a wide range of stakeholders that might use a CBDC or be affected by its introduction.

²⁰ For more information, see the Federal Reserve Board's website at <https://www.federalreserve.gov/central-bank-digital-currency.htm>.

Appendix A: Background

The *Money and Payments* paper defined CBDC as a digital liability of the Federal Reserve that is widely available to the general public. While Americans have long held money predominantly in digital form—for example, in bank accounts recorded as computer entries on commercial bank ledgers—a CBDC would differ from existing digital money available to the general public because a CBDC would be a liability of the Federal Reserve, not of a commercial bank.

The paper noted that a CBDC could offer a range of benefits. For example, it could offer the general public broad access to digital money with minimal credit risk and liquidity risk, provide a safe foundation for private-sector innovations to meet current and future needs and demands for payment services, support faster and cheaper payments (including cross-border payments), support the dollar's international role, and expand consumer access to the financial system. A CBDC could also pose certain risks and would raise a variety of important policy questions, including how it might affect financial-sector market structure, the cost and availability of credit, the safety and stability of the financial system, and the efficacy of monetary policy. Any potential CBDC would also need to protect consumer privacy, prevent illicit activity, and be resilient to operational disruptions and cybersecurity risks.

The Federal Reserve has followed developments in digital finance, including the potential benefits and risks of CBDCs, for several years. As described in the *Money and Payments* paper, while no decisions have been made on whether to pursue a CBDC, any U.S. CBDC should, among other things, complement rather than replace current forms of money and methods for providing financial services. Furthermore, analysis to date suggests that a potential U.S. CBDC, if one were created, would best serve the needs of the United States by being privacy-protected, intermediated, widely transferable, and identity-verified:

- **Privacy-protected:** Protecting consumer privacy is critical. Any CBDC would need to strike an appropriate balance between safeguarding the privacy rights of consumers and affording the transparency necessary to deter criminal activity.
- **Intermediated:** Under an intermediated model, the private sector would offer accounts or digital wallets to facilitate the management of CBDC holdings and payments.
- **Transferable:** For a CBDC to serve as a widely accessible means of payment, it would need to be readily transferable between customers of different intermediaries.
- **Identity-verified:** Financial institutions in the United States are subject to robust rules that are designed to combat money laundering and the financing of terrorism, and a CBDC would need to be designed to comply with these rules.

Appendix B: Questions Posed in *Money and Payments Paper*

The introduction of a CBDC would represent a highly significant innovation in American money. Accordingly, broad consultation with the general public and key stakeholders is essential. This appendix lists the 22 questions posed to the public in the Seeking Comments and Next Steps section of the January 2022 *Money and Payments* paper.

CBDC Benefits, Risks, and Policy Considerations

1. What additional potential benefits, policy considerations, or risks of a CBDC may exist that have not been raised in this paper?
2. Could some or all of the potential benefits of a CBDC be better achieved in a different way?
3. Could a CBDC affect financial inclusion? Would the net effect be positive or negative for inclusion?
4. How might a U.S. CBDC affect the Federal Reserve's ability to effectively implement monetary policy in the pursuit of its maximum employment and price stability goals?
5. How could a CBDC affect financial stability? Would the net effect be positive or negative for stability?
6. Could a CBDC adversely affect the financial sector? How might a CBDC affect the financial sector differently from stablecoins or other nonbank money?
7. What tools could be considered to mitigate any adverse impact of CBDC on the financial sector? Would some of these tools diminish the potential benefits of a CBDC?
8. If cash usage declines, is it important to preserve the general public's access to a form of central bank money that can be used widely for payments?
9. How might domestic and cross-border digital payments evolve in the absence of a U.S. CBDC?
10. How should decisions by other large economy nations to issue CBDCs influence the decision whether the United States should do so?
11. Are there additional ways to manage potential risks associated with CBDC that were not raised in this paper?
12. How could a CBDC provide privacy to consumers without providing complete anonymity and facilitating illicit financial activity?
13. How could a CBDC be designed to foster operational and cyber resiliency? What operational or cyber risks might be unavoidable?

14. Should a CBDC be legal tender?

CBDC Design

1. Should a CBDC pay interest? If so, why and how? If not, why not?
2. Should the amount of CBDC held by a single end user be subject to quantity limits?
3. What types of firms should serve as intermediaries for CBDC? What should be the role and regulatory structure for these intermediaries?
4. Should a CBDC have “offline” capabilities? If so, how might that be achieved?
5. Should a CBDC be designed to maximize ease of use and acceptance at the point of sale? If so, how?
6. How could a CBDC be designed to achieve transferability across multiple payment platforms? Would new technology or technical standards be needed?
7. How might future technological innovations affect design and policy choices related to CBDC?
8. Are there additional design principles that should be considered? Are there tradeoffs around any of the identified design principles, especially in trying to achieve the potential benefits of a CBDC?

Find other Federal Reserve Board publications (www.federalreserve.gov/publications.htm) or order those offered in print (www.federalreserve.gov/files/orderform.pdf) on our website. Also visit the site for more information about the Board and to learn how to stay connected with us on social media.



www.federalreserve.gov

0423