The Geopolitics of Digital Currency

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A logo for the e-CNY, a digital version of the Chinese Yuan, displayed during a trade fair in Beijing, China, Sunday, Sept. 5, 2021. (AP Photo/Ng Han Guan)

The Federal Reserve Building is seen in Washington Thursday, Jan. 14, 2010. (AP Photo/Alex Brandon)
Introduction

The U.S. Federal Reserve, Treasury Department, and Congress have begun considering the viability of a Central Bank Digital Currency (CBDC), a legal tender national digital currency for consumer use. They are understandably focused on domestic policy issues such as potential impact on U.S. financial stability or expanding public access to financial services. The national security implications of CBDCs are not yet central considerations for U.S. policymakers, but they should be.

Digitized currency is data. Digital currency will move across international borders, potentially revealing information harmful to individual, corporate, or national interests. The United States could play a critical role in fostering open and collaborative technologies that protect this data -- upholding privacy and security standards while maintaining lawful auditability in a fully digital economic world. But the United States lags other nations in its consideration of a CBDC.

China has been working toward a CBDC for almost a decade. It will be first among the world’s major economies to widely deploy a retail CBDC. Accordingly, China is well positioned to shape the global standards and processes governing this financial transformation. The results could transcend data privacy and security.

New global payment exchanges could undermine components of the international financial system that enhance U.S. financial power and help sustain norms of international behavior. Vulnerable components include the SWIFT\textsuperscript{2} messaging service, which facilitates the movement of money across international borders and, among other things, is fundamental to the U.S. financial sanctions regime. American leadership will be required to adapt international financial systems to CBDC technologies without compromising U.S. interests.

These considerations should inform and accelerate U.S. consideration of a CBDC and prompt greater American engagement in developing global standards and cross-border payments processes.
Cryptocurrencies and the Path to CBDCs

CBDCs issued by governments are new innovations. The pioneering Bahamian Sand Dollar was officially launched in October 2020. CBDCs should not be confused with private cryptocurrencies such as Bitcoin (launched in 2009) or Ethereum. Nonetheless, the growing popularity of cryptocurrencies and concerns about cryptocurrency risks have fueled government consideration of a national digital currency.

Cryptocurrencies create and maintain “sovereignless” money through decentralized, cryptographically secured digital technologies that operate independently of a government. The first cryptocurrency, Bitcoin, launched in 2009. Today, there are thousands of “crypto” currencies valued at over $2 trillion in aggregate. Anyone can create and maintain private cryptocurrencies by participating in transparent and decentralized technological processes that operate independently of a government.

Cryptocurrencies are mainly used for holding value and financial speculation rather than as a retail payments system. Extreme price volatility limits the value of cryptocurrency as a vehicle for savings, although cryptocurrencies can be more attractive than weak national currencies. Yet businesses have begun experimenting with accepting cryptocurrency. Many governments worry about the destabilizing impact of cryptocurrencies and have begun debating regulation to protect consumers.

The market has sought to address volatility by creating specialized tokens called stablecoins. These cryptocurrencies claim to be backed by reserves of government currency. Central bank officials cite concerns about excessive risk, including software security vulnerabilities, liquidity risk, and platform risks. There is also concern that widespread use of stablecoins could impede effective management of national monetary policy, which could become even more challenging as multinational tech giants issue their own stablecoins. Governments are wrestling with these issues as they seek to develop regulations that balance stability and innovation in the private cryptocurrency market.
CBDC Design

CBDCs are legal tender digital currencies, issued and maintained by governments or central banks. A retail CBDC differs from existing electronic currency transfers in two important respects.

First, retail CBDCs are for use by the general public. They are not used for “wholesale” services for private financial institutions. Central banks have long made large electronic currency transfers to commercial banks and other financial intermediaries. In the United States, the Federal Reserve’s Fedwire system provides real-time settlement for these wholesale services. In contrast, a retail CBDC can be used directly by citizens, businesses, and other private entities.

Second, retail CBDCs differ from common commercial payment services like credit cards, which provide third-party services to represent the movement of underlying legal tender like the U.S. dollar. With retail CBDCs, individuals can independently use the digital legal tender. Central banks can even provide digital currencies directly to individuals and private entities. A retail CBDC therefore represents both an evolution of certain financial practices and a potentially dramatic innovation in currency.

Advocates of retail CBDCs tout their efficiencies. CBDCs can reduce the costs, risk, and barriers to access associated with credit cards and payment platforms like Paypal, Venmo, and AliPay (which use digital representations of fiat currencies to provide money transfer services). CBDCs could also create new options for central banks. Unlike physical cash, CBDCs can be “programmed” to perform predetermined functionality like helping to implement useful monetary policy. For example, central banks can use CBDCs to provide direct government payments to citizens or create incentives for private savings or spending at a speed and efficiency that is currently impossible. Congress could enact laws that could be put into effect immediately by the Federal Reserve. Programmability is inherently flexible, so a central bank could choose to exercise as little or much of this functionality as they feel comfortable. Lawmakers could choose to start with little to no programmability.
in their CBDC and then slowly add this functionality following further study and experimentation.

Any national decision to launch a CBDC requires a myriad of decisions. For example, what policy goals might a CBDC serve? Some nations are trying to adapt to the obsolescence of cash; others aim to deliver financial services to citizens who lack access to banks. How should privacy and security be assured? Nations may differ regarding their objectives and risk tolerance. Additionally, governments face fundamental architectural questions. Should a central bank maintain a “two-tiered” approach using banks and other intermediaries to provide key financial (and privacy/security) functions? Would central banks want to capitalize on the programmability of CBDCs to play a more direct role serving citizens and controlling monetary policy?

These choices are interrelated – an architecture would affect security and privacy; policy goals could influence the overall architecture. Moreover, technical challenges will accompany each aspect of design. There will be inherent tradeoffs among technical possibilities and policy objectives. Therefore, governments would benefit from research and iterative experimentation to methodically implement and test their CBDCs.

The process of creating a retail CBDC and its supporting technologies will be centrally controlled. A national CBDC will not be completely decentralized and open to all as are private cryptocurrencies. Governments could, but do not have to, use blockchain and immutable digital ledger technology for their CBDCs. Some governments are constructing their own CBDC, while others are partnering with private technology companies.

In free-market economies, central banks will want to work closely with research and commercial organizations as they study, design, and experiment with their CBDCs. In many nations, private industry will be instrumental in integrating CBDCs into the economy. A sound international financial system also will require early collaboration and cooperation with private sector partners.
Already six Caribbean nations and Nigeria have launched CBDCs, while over a dozen states have piloted a digital currency. Nations often have specific motivations for exploring CBDCs that shape their design efforts. Sweden, for example, is seeking to ensure the availability of its currency as citizens move away from cash to rely on private payment systems. The Bahamas created its digital Sand Dollar primarily to improve financial access for its unbanked citizens. Reducing the appeal and risks of cryptocurrencies is another concern of many central banks. As more states issue CBDCs, governments may also become concerned about missing out on a major trend in global currency. China’s expected e-CNY will add significant momentum to the transition to CBDCs.
**Geopolitical Impact**

CBDCs could disrupt elements of an international financial system that has greatly benefited the United States and enhanced its global influence. The dollar’s position as the favored reserve currency provides America with strategic advantages, from lower borrowing costs to leverage over global norms via sanctions enforcement. CBDCs therefore create opportunities for states wishing to challenge the status quo and potential vulnerabilities for states that thrive in today’s architectures and processes.

For example, digitization may enable a government to expand other states’ use of its currency beyond its borders, as real time settlement eliminates reliance on third parties such as credit card companies, SWIFT, or mobile payment platforms. Instead of exchanging foreign currency in physical form, consumers might be able to easily access foreign CBDCs through linked mobile payment apps (which also raises questions about foreign access to citizens’ financial data). Additionally, by using CBDCs to create new localized cross-border payment systems, governments can promote commercial reliance on their national CBDC. Finally, states that lead in innovation traditionally have led the development of international standards governing those technologies, raising questions about whether the United States can steer the global community’s transition to CBDCs if China is the leading CBDC pioneer.

China has clearly signaled its hope that CBDCs will alter international financial dynamics. Wang Xin, director of the PBOC’s (People’s Bank of China) research division, has stated: “If the digital currency is closely associated with the U.S. dollar, it could create a scenario under which sovereign currencies would coexist with U.S. dollar-centric digital currencies. But there would be in essence one boss, that is the U.S. dollar and the United States. If so, it would bring a series of economic, financial, and even international political consequences.”

More pointedly, China sees national digital currency as a tool to chip away at the U.S. dollar’s global status. China will likely focus on ensuring international compatibility with its CBDC and promoting reliance upon
its national currency. As the world’s second largest economy moves toward issuing its own CBDC, China will be in a strong position to influence new rules for CBDCs, particularly with its major economic partners and political allies.

**China’s e-CNY**

China was among the first nations to begin exploring a CBDC. Its experience illustrates that even a single party state can take years to move from a research project to a meaningful pilot program before it can be considered for national use. A few years after the PBOC – China’s central bank – formed a national digital currency research group in 2014, the Bank’s governor publicly broached the possibility of a Chinese digital coin (token) based on a “first-generation prototype of digital fiat currency.”

By late 2017 the PBOC began working with commercial institutions to develop and test its new retail e-CNY for the commercial sector. China says that its CBDC will be enhanced iteratively in response to feedback from pilot programs.

China has shared only high-level descriptions of its evolving e-CNY technology. The actual mechanics of how it has implemented its e-CNY platform remain unknown because the e-CNY software is closed source. This means sensitive details like privacy protections are unavailable for source code review to verify the effectiveness of the implementation.

The PBOC will use a “two-tier” or “intermediary” system, issuing tokens through commercial banks and other institutions (e.g., Tencent, Union Pay). These institutions will in turn distribute the e-CNY to companies and the public. Users may be required to authenticate their identities to open a digital wallet to send, receive, and hold e-CNY. Individuals will not need to be continuously connected to the internet or a bank account. They will be able to use the e-CNY on mobile devices using near-field communications in concert with an embedded digital wallet that allows offline money transfers when wallets physically touch.

Based on the information currently available, China’s overall technological approach to its CBDC appears familiar to experts in the field.
In January 2021, China began a pilot program in select cities enabling public use of the e-CNY, gradually expanding the pilots’ geographic reach. As China progressed toward larger national pilots of its CBDC, it simultaneously restricted private decentralized cryptocurrency use and creation (mining). In January 2022, China made a trial version of its e-CNY wallet application available for public download on the Chinese iOS and Android app stores. Chinese citizens already rely on cashless mobile payment systems that easily integrate with CBDC wallets. In another major step, China will make the e-CNY available for use by foreign visitors to the 2022 Beijing Winter Olympics, the first test of international appetite for Chinese digital currency.

The e-CNY could have far-reaching implications. In addition to making economic transactions more efficient and complex monetary policies easier to implement, China’s CBDC will provide the PBOC direct access to sensitive financial information of individuals and businesses, including entities outside of China. Global governments should evaluate the degree to which their citizens’ financial data should remain private and structure their policies accordingly.

Data: Privacy and Security

CBDCs give central banks direct, immediate access to the digital record of currency transactions. That digital record includes details such as the amount, time, source, and destination of each financial transaction. Governments must carefully consider questions of data privacy and security as they create their CBDCs so they can mitigate the vulnerability of this vast trove of data.

Governments will wish to protect CBDC data from outside parties (to provide security and privacy for user data) while simultaneously advancing other goals, which could range from national law enforcement to providing services to citizens. Nations may define and balance those goals differently and they will seek to reflect their choices in the technical design of their CBDCs.

Data privacy begins with identity requirements. If CBDCs were treated like cash, personal identification would not be required. Alternatively, CBDCs
could be structured more like bank accounts, which require verifying key identifying details about the account holder. How much personal information should be shared, and what policy goals would this information support? Will identification requirements be subject to local laws?

Governments also need to establish policies, laws, and implementation guidelines for monitoring and protecting CBDC transactions. Which types of transactions will be regularly tracked and why? What level of data security is possible using creative cryptographic schemes? How should privacy regulations like GDPR affect CBDC transactions? These are among the most sensitive questions societies will face in considering a CBDC.

China’s e-CNY will establish a leading precedent. The government calls its approach to privacy protection “managed anonymity.”16 By managing the requirements for the creation of wallets, the government can distinguish between the type of personal identification needed for small, low-value transactions and the identification required to open larger, higher-value accounts. Small transactions will be anonymous, according to the government, because they will not be examined to reveal the identities of users. Authorities claim that the e-CNY system “collects less transaction information than traditional electronic payment” and they tout the security and privacy protocols.17 Unfortunately, implementation of the e-CNY remains opaque.

In practice, privacy protection also will hinge upon the governing political and legal regime. For example, in China, the Chinese Communist Party (CCP) determines the content and enforcement of laws and regulations. National law already requires the private sector to share information with the state for intelligence purpose. The CCP’s use of government-collected and acquired data for social control and political repression is well documented.18 “There is no reason to believe that financial data obtained through an e-CNY would be exempt from such practices.”19 In addition, the e-CNY and Chinese-centered payment platforms could provide the CCP access to new sources of foreign financial information.

Data security is also critical consideration in any government’s design of a CBDC. Legal and illicit data capture has become a standard aspect
of geopolitical competition. National CBDC transaction records will be attractive targets. Hacking CBDCs could provide adversaries with insights and strategic influence. In addition to protecting citizens’ personal information, governments must prevent nation state adversaries and criminal actors from gaining access to sensitive domestic economic data. Advanced cryptographic techniques like homomorphic encryption and secure multiparty computation could be applied to secure sensitive personal data.

International bodies and private groups should help develop a broad menu of policy and technical options to help nations consciously align their CBDC design with national values and laws and maximize data security. Citizens and private entities will benefit from guidance regarding the privacy and security inherent in using a particular CBDC.

**Global Payment Systems and the U.S. Dollar**

CBDCs could enable seamless movement of money across borders, yet they could also presage the fragmentation of international payment systems and the emergence of a Chinese sphere of financial influence to help insulate nations from U.S.-led financial sanctions. China and other nations bristle at the preeminence of the U.S. dollar and American influence over the SWIFT interbank messaging service, which handles many international financial transactions. SWIFT is critical for helping the United States and its partners enforce international sanctions. Nations can also be vulnerable to being disconnected from the SWIFT system entirely. (CCP officials reportedly nursed this worry earlier this year as they cracked down on Hong Kong\(^2^0\)). A digital e-CNY could boost China’s efforts to promote the use of its currency in international exchanges.

China encourages international reliance upon its national currency in a variety of ways: large-scale international trade and development initiatives like the Belt and Road Initiative; Chinese mobile payments platforms which are spreading rapidly throughout Asia, Africa, Europe and beyond; and a new international payments system.\(^2^1\) In 2015, the PBOC established the Cross-border Interbank Payment System (CIPS) as
a Chinese currency-centered alternative to SWIFT. Instead of replicating SWIFT’s function (sending messages to arrange the terms of a payment transfer between and by other organizations), CIPS clears and settles the transfer simultaneously – executing the transaction faster and cheaper. This allows CIPS to work as a clearing and settlement system when integrated with SWIFT. Nearly a thousand institutions in roughly 100 countries have used the system.\(^2^2\) A digital currency could allow the necessary discrete payments steps to be compressed still further. In this sense, international payment processes (to include CIPS) remain ripe for disruption.

SWIFT leadership has acknowledged the need to improve transaction efficiency, data quality, and transparency. Citing Chinese regulatory compliance and customer demand, SWIFT created a joint venture with three Chinese entities including CIPS early in 2021 to provide information system integration, data processing, and technological consulting.\(^2^3\)

In parallel with partnering with SWIFT, China is exploring alternatives. The e-CNY can operate directly with any entity that opens an e-CNY account to execute, clear and settle transactions. Tight integration of these processes mean that the e-CNY could help displace SWIFT. In 2021 China also joined what is now called the Multiple CBDC (mCBDC) Bridge Project, previously launched by Hong Kong and Thailand, to explore a multi-currency cross-border payment system for wholesale activity.\(^2^4\) China aims to include other Asian nations in this distributed-ledger technology project.\(^2^5\)

Chinese officials appear to recognize other nations’ concerns about a competing e-CNY ecosystem. Zhou Xiaochuan, former head of the PBOC said, “Some countries are worried about the internationalization of yuan. We can't push them on sensitive issues and we can't impose our will. We must avoid the perception of great power chauvinism.”\(^2^6\)

Regardless of the Chinese government's intentions, CBDCs may enable the disruption of certain legacy processes undergirding Western financial power. China's stated national interests and past actions suggest that its position as a CBDC pioneer could allow it to begin gradually reshaping aspects of the international financial system to serve CCP interests.
Conclusion

The United States lags other major economic powers, especially China, on the path to a digital national currency. Federal Reserve Chairman Powell has emphasized the need to be deliberate. “We do think it’s more important to get it right than to be first,” he explained, “and getting it right means that we not only look at the potential benefits of a CBDC, but also the potential risks, and also recognize the important trade-offs that have to be thought through carefully.” Yet there are geopolitical risks associated with delay. The United States should prioritize expeditious and collaborative exploration of CBDC designs.

Fortunately, Federal Reserve has been conducting a variety of research on how to implement CBDCs and other payments technologies using both legacy and newer technologies. The Boston Federal Reserve Bank has been conducting CBDC research in partnership with the Digital Currency Initiative at MIT. Called Project Hamilton, the effort aims to build a modular and scalable CBDC platform. The researchers are exploring different technical and policy issues to ensure the speed, security, privacy, and resilience of any U.S. CBDC. While ambitious in its goals, it remains modest in scale and resourcing.

The evolving platform could provide a foundation for more open and collaborative international CBDC efforts. The results of Project Hamilton will be released as open-source software that any party can review and modify for its own use. Because other governments can scrutinize, contribute to, and further customize the software, they can assess its integrity and compatibility with their own national policy goals, including privacy protections. Therefore, even if the United States lacks its own CBDC, its research efforts could promote a transparent and democratic CBDC ecosystem.

Some Federal Reserve Governors, Treasury officials, and Members of Congress have offered thoughts about how CBDCs might advance financial inclusion or enable direct payments to citizens. But there is not yet a framework for national decision-making, let alone any consensus about
moving toward a CBDC. Policymakers have yet to engage the full range of stakeholders from commercial banks to privacy advocates. Ultimately, Congress will have to define the goals and policies governing any CBDC, including the respective roles of government and the private sector.

Other countries will not simply wait for the United States to develop an American CBDC before they consider designing their own CBDC. The United States thus may find that both its domestic options and global influence regarding CBDCs will shrink over time. China, with its impending CBDC launch, is well-positioned to lead international efforts to develop standards, pioneer new uses, or develop new payments systems. This could undermine the interests of the United States and its global partners as well as global norms of state behavior.

The United States should closely monitor the technical development and practical implementation of China’s e-CNY to better understand evolving data access and alternative payments systems issues and their potential implications. The U.S. government should engage with academia, the private sector, and global partners and institutions (e.g., the Bank for International Settlements, International Monetary Fund, World Bank) regarding CBDC technical and policy choices. The U.S. should provide additional resources for the Federal Reserve and its partners to expand and accelerate research and experimentation on CBDCs.

U.S. officials should build a coalition of nations to promote the adoption of international standards and payments processes that are open, collaborative, and consistent with democratic interests and values. Finally, U.S. policymakers should factor in the geopolitical stakes as they consider the timeline and domestic issues associated with a potential American CBDC.


4. Stablecoins are often built upon existing cryptocurrencies like Ethereum, which means the stablecoin in question inherits any destabilizing risks that threaten the economic or technical health of the host platform. The U.S. Treasury has identified several such risks, including risks of fraud, conflict of interest, misleading or misused information, as well as risks of governance, interoperability, and security. “Report on Stablecoins.” [Treasury.gov](https://www.treasury.gov), President’s Working Group on Financial Markets, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency, November 2021. [https://home.treasury.gov/system/files/136/StableCoinReport_Nov1_508.pdf](https://home.treasury.gov/system/files/136/StableCoinReport_Nov1_508.pdf).

5. In theory, a group of nations might use decentralized technologies to collaborate in the governance of a common CBDC like an “e-Euro”, but unlike cryptocurrencies, even if governments outsource the creation of the CBDC software platform to a private entity, they are unlikely to outsource the governance of their operational CBDC.


9. PBOC. *Progress of Research & Development of E-CNY in China*.

10. Ibid.


16. PBOC. *Progress of Research & Development of E-CNY in China*.

17. Ibid.


22 Ibid.


