

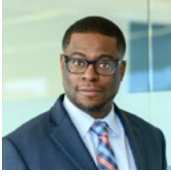


# China's Digital Currency

## Adding Financial Data to Digital Authoritarianism

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## About the Energy, Economics, and Security Program

The Energy, Economics, and Security Program analyzes the changing global energy and economic landscape and its national security implications. From the shifting geopolitics of energy to tools of economic statecraft, such as trade and investment policy and sanctions, the program develops strategies to help policymakers understand, anticipate, and respond. This program draws from the diverse backgrounds and expertise of its team and leverages other CNAS experts' strengths in regional knowledge, technology, and foreign policy to inform conversations at the nexus of markets, industry, and U.S. national security and economic policy.

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## Executive Summary

China is pushing aggressively to be a global leader in financial technology. Over the last several years, use of mobile payment platforms has exploded in China while cash transactions have declined. At the same time, global interest in the development of central bank digital currencies (CBDCs) has also risen, with dozens of central banks now researching ways to offer digital versions of their fiat currency to ordinary citizens. The People's Bank of China (PBOC) is leading in these efforts, aiming to release a central bank digital currency of its own. This CBDC system, which the Chinese government calls Digital Currency/Electronic Payment (DCEP), will likely enable the Chinese Communist Party (CCP) to strengthen its digital authoritarianism domestically and export its influence and standard-setting abroad. By eliminating some of the previous constraints on government data collection of private citizens' transactions, DCEP represents a significant risk to the long-held standards of financial privacy upheld in free societies.

The PBOC's DCEP strategy is motivated by a number of factors. The dominance of private mobile payment firms in China has given such companies an outsized role in retail commerce, making them indispensable to the economy. The PBOC is seeking a digital currency to harness the market share and technological innovation of private financial firms and to gain better access to information about the financial activities of Chinese consumers. DCEP is also part of China's geopolitical ambitions, and CCP officials frame the progress of DCEP as similar to advancements in other strategically important emerging technologies, such as artificial intelligence and robotics. DCEP's development also comes against a backdrop of China's broader push to internationalize the renminbi.

Few technical details about DCEP are publicly confirmed. The PBOC has indicated that DCEP will have a two-tier structure, with the PBOC managing the back-end infrastructure while employing banks and other companies to aid in distribution to the public. It is clear that, despite much initial PBOC discussion about distributed ledger infrastructure, DCEP will not use blockchain as part of its design. DCEP is also likely to allow for some basic programmability involving its transactions and to offer users the opportunity to access the currency via software wallets. Despite some official statements and reporting about these general features, much of the precise operational architecture is still being worked out.

It is also clear that the Chinese government hopes to leverage DCEP for the CCP's domestic political agenda. Whereas PBOC officials have indicated that they will harness huge amounts of DCEP data to enhance monetary policy and monitor for illegal activity, officials higher in the Chinese government have stressed DCEP's value as a tool for enforcing party discipline. PBOC officials also have said that DCEP will have "controllable anonymity," allowing the central bank to see all of the transactions taking place while maintaining privacy among transacting parties. However, the system will also enable the CCP to exercise greater control over private transactions, as well as to wield punitive power over Chinese citizens in tandem with the social credit system. Additionally, although a number of PBOC officials hope DCEP will help drive internationalization of the renminbi, DCEP is unlikely to do so by itself in the short term.

The PBOC is in position to launch the largest digital currency project of any major economy. DCEP pilot tests have been underway since mid-2020 in several localities, and a number of state-owned banks and technology firms are building interfaces and distribution systems for the platform. The PBOC hopes to make DCEP available for wider use around the time of the 2022 Winter Olympics, which will be hosted in Beijing.

With China's quick progress in developing and testing the system, U.S. policymakers must closely track DCEP's development and act strategically to address its potential to further the CCP's coercive power and its influence in the evolving global financial system. Although DCEP is not likely to displace the U.S. dollar as a global reserve currency, it may serve as a model and standard-bearer for other countries to emulate. The United States might not necessarily need to create its own CBDC, but it must adapt to the quickly changing payments space, understand the geopolitical implications of this technology, influence its development, counter the DCEP's threats to political and economic liberty, and ensure that financial technology innovation does not further China's digital authoritarianism.

## Introduction

China is pursuing global dominance in financial technology.<sup>1</sup> The country's central bank, the People's Bank of China (PBOC), is developing a digital version of the renminbi that it intends will replace its physical currency. Through this project, Beijing is aiming to advance China's technical and economic prowess, strengthen Chinese Communist Party (CCP) control over the Chinese population, and counter U.S. financial influence around the globe. And while numerous central banks are conducting central bank digital currency (CBDC) research and pilots, China's effort is the most advanced of any large, major economy to date.

Chinese officials call the project Digital Currency/Electronic Payment (DCEP), and it fits as part of the CCP's strategy to use "informatization" to "vigorously develop the digital economy" and transform China into a "cyber superpower."<sup>2</sup> In September 2020,

the state's economic planning agency published a strategic guidance document calling for government and industries to seek "digitalization and intelligentization."<sup>3</sup> DCEP—which will collect and analyze big data around users' daily transactions—supports that aim.

This digital currency push is a major step in expanding the party's digital authoritarianism, adding real-time financial data into the CCP's strategy for technology-driven governance.<sup>4</sup> Undoubtedly, the PBOC's progress with DCEP will complement—and most likely bolster—Beijing's endeavor to leverage artificial intelligence and big data for stronger domestic surveillance.<sup>5</sup> What will be more difficult for Beijing is to convince the rest of the world that its new digital renminbi makes Chinese currency any more attractive for global finance.

This report will explain China's domestic and international ambitions in developing a CBDC, review the main technical framework of DCEP and how the PBOC and private firms are working to implement it, and discuss the ways this digital currency project adds to the CCP's authoritarian toolkit. Although DCEP has received much international press coverage, most media reporting has not addressed how it fits into the CCP's broader political and economic strategies. Only recently have policy research institutions outside of China begun to offer rigorous analysis and ground

truth about DCEP. This work complements the in-depth research by the Australian Strategic Policy Institute, which released a comprehensive report on DCEP in October 2020.<sup>6</sup>

With China as the world's second biggest economy, the move to a fully digital renminbi is undeniably momentous. Unlike digital payments today, in which banks and payment companies must credit and debit the bank accounts associated with online and mobile transactions (often taking days), DCEP transactions will be authenticated immediately. The move also will arm China's economic planners with a range of data that no other government has ever been able to efficiently assemble. DCEP will also potentially enable easier cross-border transactions for Chinese currency, which could enhance Chinese firms' flexibility in global trade. The digital currency's technical architecture will allow for real-time or near-real-time financial surveillance of all users' trans-

actions, something currently not feasible by any country in today's global banking system. DCEP

is not just a technical experiment. It is a giant leap for the CCP's control and influence in Chinese society. U.S. policymakers need to understand this technology and the monetary policies around it in order to devise foreign policy that sufficiently addresses the CCP's evolving domestic and international power.

### **DCEP will bolster Beijing's endeavor to leverage artificial intelligence and big data for stronger domestic surveillance.**

## Beijing's Motivations

China's push for DCEP comes from a twofold motivation: to promote domestic economic dynamism, but with greater state control, and to gain strategic positioning and influence globally. The domestic aim is immediate, focused on making tangible shifts in how China's economy operates and in what data can be collected and analyzed from citizens. This aim is part of the CCP's quest to "informatize" the economy. The international aim is long term and more aspirational, driven by Beijing's sense that progress in digital currency is a critical next stage of geopolitical technology competition. The PBOC's progress in the domestic goal feeds the international one, however, because many nations are also considering how to develop central bank digital currencies. DCEP offers a potential model for other central banks to emulate and, along with the technology itself, could help the CCP export its authoritarian practices and capabilities to other countries.

### Pursuing Dynamism for a Cashless Domestic Economy

Use of cash is already becoming rarer throughout China.<sup>7</sup> A 2019 PBOC report identified a 50 percent growth in volume in cashless transactions from the

previous year, growing from about 220 billion transactions to roughly 331 billion transactions.<sup>8</sup> The PBOC is developing DCEP to support the bank's stated aim to remove coins and banknotes from public circulation and promote monetary efficiency. In 2016, then-PBOC Governor Zhou Xiaochuan explained in an interview that the PBOC planned to eventually replace physical renminbi cash with a digital renminbi that would be cheaper for the government to manage.<sup>9</sup> PBOC Deputy Governor Fan Yifei argued, also in 2016, that a state-run digital currency could benefit from many of the technical features of such independent cryptocurrencies like Bitcoin without exhibiting their downsides.<sup>10</sup> Fan specified that a "legal digital currency" could "reduce operating costs, increase efficiency and enable a wide range of new applications" without cryptocurrencies' volatility and anonymity of use.<sup>11</sup>

Much of what the PBOC envisions in developing DCEP could be considered a central banker's dream. Fan proposed that a state digital currency would improve China's financial system by making it easier to measure currency circulation and thus calibrate monetary policy. He also said it would help banking authorities supervise anti-money-laundering and know-your-customer requirements and foster financial innovation.<sup>12</sup> The previous head of the PBOC's Digital Currency Research



An individual uses a QR code to make payment at a market in Beijing. The use of mobile payment platforms has exploded in China in recent years. (Kevin Frayer/Getty Images)

Institute (DCRI), Yao Qian, specified in a 2019 research paper that a central bank digital currency would be “traceable and programmable” and would allow financial authorities “to track and monitor how CBDC circulates after issuance,” something not plausible with cash.<sup>13</sup> Officials have said that DCEP will help with financial inclusion by enabling digital transactions in remote rural areas.<sup>14</sup> Unlike the digital and mobile payments in use today, DCEP will essentially be a digital banknote, redeemable just like a cash bill, but with user and transaction data recorded by the central bank.<sup>15</sup>

PBOC officials are also mindful of the growing influence of private sector fintech on the Chinese economy and see DCEP as a way to reassert state dominance into the domestic payments space. But the Chinese government wants to harness, not undercut, the private sector’s success. Yao emphasized that the central bank was concerned that private Chinese internet firms such as Ant Financial and Tencent were becoming “too big to fail,” given their increased role in commerce.<sup>16</sup> Yao published a seminal paper, “A Systemic Framework to Understand Digital Currency” in 2018, in which he wrote, “[T]he reality is that the private sector has already taken a lead ... There is no doubt that this is a result of the impressive innovative power on the part of the private sector. But this also means that the central bank has to catch up.”<sup>17</sup> Yao also stated that a digital currency should make “money smarter” and that “the issuance of CBDC to end users is significant to building a better payment system, to maintaining financial stability and to enhancing [the] central bank’s authority.”

DCEP is, thus, the CCP’s attempt to bring critically important financial infrastructure more directly under the central bank’s control. As Yao stated, “It is absolutely feasible for the central bank to draw on modern technologies and reuse modern information networks and financial infrastructure, to innovate the issuance and circulation mechanism of fiat money, to create CBDC, to optimize the payment function of fiat money and to reduce reliance on payment services offered by the private sector.”<sup>18</sup> However, the PBOC is not planning to totally disrupt China’s private fintech companies. In fact, the central bank’s strategy is to incorporate those firms into DCEP architecture.<sup>19</sup> So the CCP is bolstering private firms while strengthening the government’s foothold in the economy. It is also seeking to give Chinese users more digital payment options, especially after banning cryptocurrency “initial coin offerings” a few years ago.<sup>20</sup>



Cash use has declined in China over the last several years as mobile payment use has increased rapidly. Major state-owned banks and technology companies are now working with the PBOC to test and implement China’s national digital currency. (VCG/VCG via Getty Images)

### Positioning China for Geopolitical Competition

DCEP also fits into Beijing’s strategic global competition—and conflict—with the United States. Although in public statements, PBOC officials generally focus on the project’s domestic utility, they have sometimes described what they perceive to be its geopolitical implications. At a United Nations information technology conference in New York in 2018, Yao presented slides showing how China’s digital currency would work.<sup>21</sup> His ending slide likened digital currency progress to China’s advances in robotics, big data, and artificial intelligence. Yao posited digital currency as part of “the Next War,” referring to an article in *The Economist* of the same title that discussed technology’s role in the rising tensions between the United States and its major-power adversaries, including China.<sup>22</sup>

In late 2018, PBOC researchers published an article on *CN Finance*, a PBOC-run publication, pushing for the development of a renminbi digital currency to help offset economic threats to China.<sup>23</sup> The authors argued that private U.S.-dollar-based stablecoins prevalent in the market could increase the dollar’s global dominance and hurt the renminbi’s international use.<sup>24</sup> This piece was published before the Facebook-initiated Diem

stablecoin project, which is linked to a basket of currencies, including the dollar, was announced in 2019. In mid-2020, Mu Changchun, the successor to Yao Qian at the DCRI, argued the DCEP would prevent Libra—the original name for Diem—from encroaching on China's monetary system.<sup>25</sup>

At a conference in Shanghai in late 2019, the vice chair of the China Center for International Economic Exchanges, Huang Qifan, framed China's digital currency project as a bulwark against U.S. financial and political influence in the SWIFT interbank financial messaging system.<sup>26</sup> SWIFT facilitates most of the world's global banking transfers. Huang argued that developing DCEP would help China guard against the U.S. ability to “exercise global hegemony and carry out long-arm jurisdiction” through SWIFT.<sup>27</sup>

China is seeking a stronger foothold in the global financial system of the future. Beijing aims to counter the U.S. role as standards setter, cultivate Chinese government leadership in international engagement on digital currency technology, and potentially offer technological know-how to other interested nations. Martin Chorzempa of the Peterson Institute for International Economics has argued that China is trying to set

international standards on CBDCs and gain an advantage against any potential international competitors, whether from state-based or private digital currencies.<sup>28</sup>

### Leading the Global Interest in CBDCs

China's development of a CBDC is also occurring within the broader context of central banks reassessing their national payments systems and updating them for the digital age. In the race among large economies to launch a state digital currency, China appears to be farthest ahead in testing and scope. Survey data collected by the Bank for International Settlements (BIS) from early 2020 indicate that, among the 63 central banks they surveyed, over 80 percent are now engaged in research or experimentation with CBDCs, up from only around 60 percent in 2017.<sup>29</sup> According to the BIS survey, many central banks, similar to the PBOC, are motivated to explore CBDC because of declining cash use, the possibility for more direct transmission of monetary policy, and the possibility of increasing the robustness and safety of digital payment infrastructure. Additionally, CBDCs could help countries limit concentration in the payments system and promote innovation.<sup>30</sup> However, few central banks have advanced as far as the PBOC, with the BIS data showing under 10 percent of surveyed central banks in the process of testing or implementing a CBDC. While a number of smaller countries, including Uruguay, Sweden, and the Bahamas, have led in testing pilot versions of CBDCs, China is the first major economy to pilot a state-based digital currency.<sup>31</sup>

Among major advanced economies, the approach to CBDC has been much more cautious and focused on researching various technical and legal design considerations. The Bank of England, citing concerns about declining cash use, released a discussion paper in March 2020 outlining the factors it is considering in its CBDC exploration.<sup>32</sup> The Bank of England concluded that more research was needed “to be clear that the net benefit for payments users, the financial system, and society as a whole would outweigh any risks.” Advanced-economy central banks have also focused on the difficulties in managing privacy in CBDC design, with the Bank of Canada releasing a study in mid-2020 outlining a variety of privacy options for CBDCs.<sup>33</sup>

In comparison, the United States has lagged behind in exploring CBDC. The Federal Reserve seemed largely resistant to advancing serious research into CBDCs until Governor Lael Brainard indicated in an August 2020 speech that the Fed is collaborating with the Massachusetts Institute of Technology to explore and test a possible CBDC for the United States.<sup>34</sup> Federal



*Then-Governor of the People's Bank of China Zhou Xiaochuan (left) and Party Committee Secretary of PBOC and Chairman of the China Banking Regulatory Commission Guo Shuqing talk during a news conference in Beijing. Zhou played a major role in the development of DCEP in its initial stages. (Etienne Oliveau/Getty Images)*



## KEY PLAYERS FOR DIGITAL CURRENCY/ELECTRONIC PAYMENT (DCEP) PLANNING, INFLUENCE, AND IMPLEMENTATION

**Digital Currency Research Institute (数字货币研究所):** This branch of the People's Bank of China (PBOC) directs research and development efforts of China's DCEP project. It was established in 2014 and is currently under the leadership of Mu Changchun.

**Financial Stability and Development Committee (金融稳定发展委员会):** This committee was created directly under the State Council in 2017 as part of the Chinese Communist Party's (CCP) emphasis on regulatory control. The FSDC oversees both financial agencies and security agencies. Through the FSDC, financial bodies, such as the China Securities Regulatory Commission and the State Administration of Foreign Exchange, engage with party security bodies, such as the Central Commission for Discipline Inspection, the Ministry of Public Security, the Publicity Department of the CCP Central Committee, and other agencies.<sup>36</sup>

**Central Commission for Discipline Inspection (中央纪律检查委员会):** The highest internal control agency within the CCP,<sup>37</sup> this powerful anti-graft agency has an authority equal to, if not greater than, that of the major CCP authoritative bodies, such as the State Council, the National People's Congress, the Supreme People's Court, and the Supreme People's Procuratorate.<sup>38</sup> This commission—highly influential on internal security matters—has issued a video interview with Mu, director of the DCRI, describing DCEP as a tool to prevent corruption and misconduct by party members.<sup>39</sup>

**Various State-Owned Banks and Firms:** Many state firms are involved in the implementation and testing of DCEP. The “big four” banks are the Industrial and Commercial Bank of China, Bank of China, China Construction Bank, and Agricultural Bank of China. The “big three” network operators distributing DCEP include China Telecom, China Mobile, and China Unicom.

## Notable Individuals of Influence

**Zhou Xiaochuan (周小川):** Governor of the PBOC from 2002 to 2018. He sits on crucial central leading small groups (LSGs) under the central committee: the Central LSG for Comprehensively Deepening Reform, the Central LSG for Finance and Economy, and the Central LSG for Internet Security and Informationization.<sup>40</sup>

**Guo Shuqing (郭树清):** Party committee secretary of the PBOC.<sup>41</sup> He is also the chair of the China Banking Regulatory Commission. While the PBOC governor runs the bank's operations, the party secretary has the final say in strategic decisions. He has argued for the CCP to integrate and oversee supervision mechanisms at all levels of China's financial system.<sup>42</sup>

**Yi Gang (易刚):** Governor of the People's Bank of China since 2018. He has been a deputy director of the Central LSG for Finance and Economy since 2014 and was formerly the director for the State Administration of Foreign Exchange from 2009 to 2016.<sup>43</sup>

**Yao Qian (姚前):** Former director and founder of the DCRI, who has written numerous academic papers on central bank digital currency. He currently is the general manager at the China Securities Depository and Clearing Corporation (CSDC).<sup>44</sup> Yao has been a prominent advocate for using blockchain technology for CBDCs, although the PBOC no longer appears to support a blockchain-based design for DCEP. Under his leadership, the CSDC is spearheading initiatives to adopt blockchain into China's financial securities sector.<sup>45</sup>

**Mu Changchun (穆长春):** Current director of the DCRI. He was formerly head of the PBOC's Payment and Settlement Department.<sup>46</sup>

**Fan Yifei (范一飞):** Deputy governor of the PBOC since 2015. He was formerly the executive vice president at China Construction Bank.

**Li Lihui (李礼辉):** Head of the blockchain research unit at the National Internet Finance Association of China, an organization under the PBOC, and former president of Bank of China.<sup>47</sup> He has argued that global regulators need to collaborate over digital currencies.<sup>48</sup>

**Zhou Li (周力):** Senior fellow at the Chongyang Institute for Financial Studies of Renmin University and former deputy minister of the International Liaison Department of the CCP. He has written about the need to counter the U.S.-led global financial system by decoupling the renminbi from the dollar.<sup>49</sup>

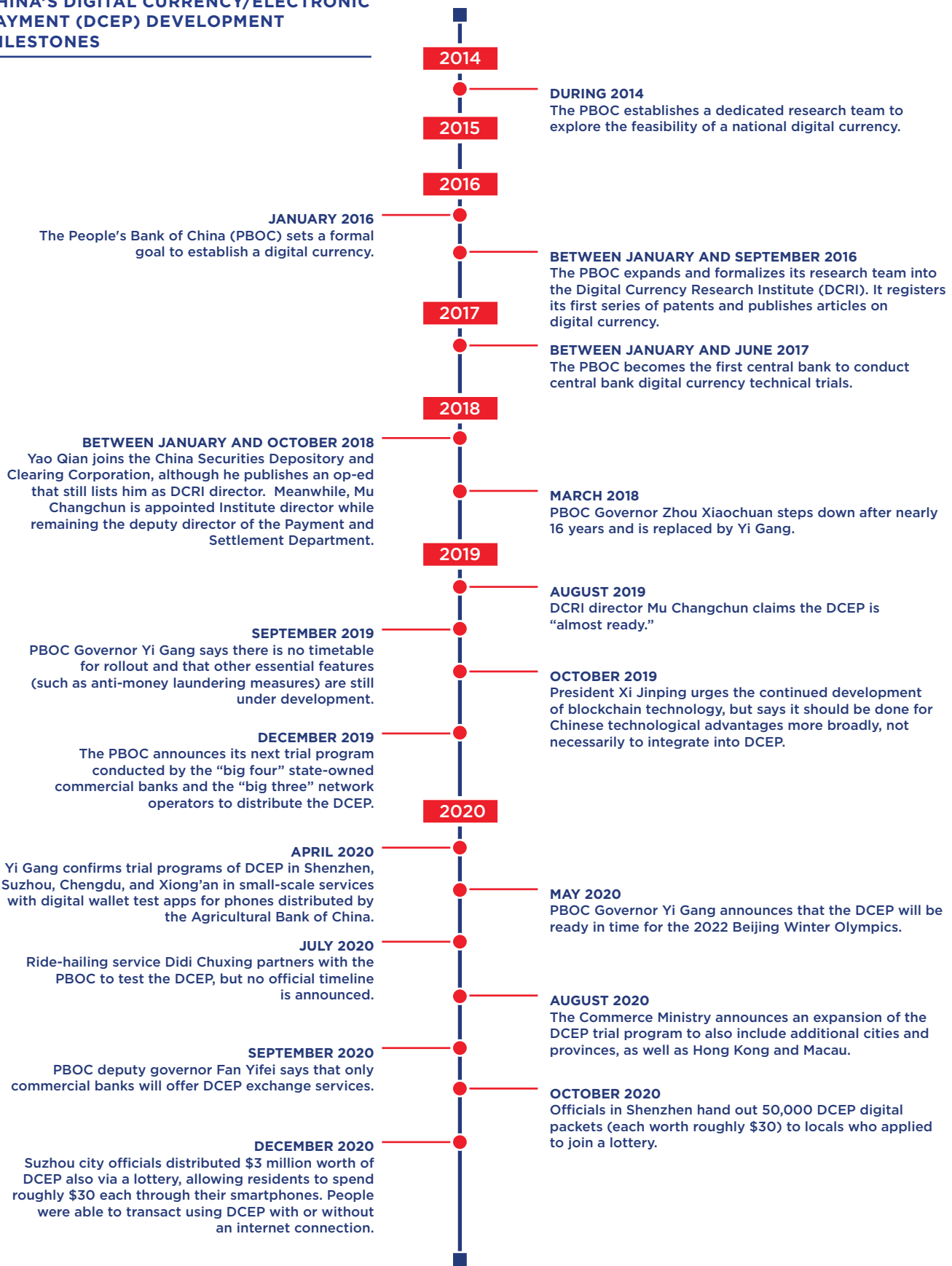
**Wang Zhongming (王忠明):** Former CCDI member and former deputy director of the China Social Security Fund. Wang is another key CCP influencer who pushes publicly for integrating DCEP into the Chinese market and financial system.<sup>50</sup>

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Yi Gang (left), deputy governor of the People's Bank of China, and Zhou Xiaochuan (third from left), then-governor of the PBOC, attend a news conference with other financial regulators at the Great Hall of the People in Beijing. Zhou and Yi have regularly advocated for DCEP and have been key players in its development over the last several years. (Lintao Zhang/Getty Images)

**CHINA'S DIGITAL CURRENCY/ELECTRONIC PAYMENT (DCEP) DEVELOPMENT MILESTONES**



Reserve Chair Jerome Powell indicated similar caution during testimony before the U.S. House Financial Services Committee in June 2020, stating that the Federal Reserve needed to more actively study CBDCs but was not yet committing to developing or implementing a digital dollar.<sup>53</sup> In this context, China's CBDC progress is likely to offer Beijing some first-mover advantage as it develops deeper knowledge about the technology, benefits from study of its policy and economic impacts, and, potentially, influences global standards on CBDCs.

## Official DCEP Details Are Scarce

**C**hinese officials are pushing for DCEP to be widely available in 2022. Insight into how DCEP is likely to operate comes mostly by piecing together a variety of statements and research documents by PBOC officials; the PBOC has not released any white paper that explains the project's technical details. In the absence of an official DCEP blueprint document, several articles about CBDC framework, design, and issuance must serve as proxies for PBOC plans. The most relevant scholarly articles are papers written by Yao Qian between 2017 and 2019, mostly while he headed the DCRI. When senior PBOC officials have discussed DCEP in speeches and interviews, their comments have aligned with much of Yao's CBDC writings. This report draws heavily on those papers, speeches, and interviews, as well as press articles in Chinese-language and China-focused media.

If the PBOC does publish technical information about DCEP, it will no doubt withhold details that it deems sensitive. In 2016, then-PBOC governor Zhou explained that operational details about how the bank prevents counterfeiting are “national secrets,” whether for fiat currency or digital currency.<sup>51</sup> Many other elements will likely be guarded, given the cybersecurity risks that come with a digital currency, as well as concerns about global competition and first-mover advantage.<sup>52</sup>

### DCEP to Have a Two-Tier Structure

Despite the lack of public information about its operational details, DCEP's basic framework is clear. The PBOC is planning to issue DCEP in a way that will allow the central bank to create and manage the back-end properties of the digital currency while leveraging commercial firms for its public distribution. In this two-tier structure, the central bank will create the actual digital renminbi, but people will acquire the currency through software wallets provided by financial

firms. PBOC officials wrote publicly about this two-tier model as early as 2016.<sup>53</sup> Given the CCP's emphasis on increasing oversight over the entire Chinese financial system, this architecture—though bifurcated—is likely to give the Chinese government significantly more influence over domestic economic activity and the private sector in particular.

More recently, DCRI head Mu described the motivation of a two-tier structure at length at a financial forum in the city of Yichun in August 2019.<sup>54</sup> He explained that if the central bank disbursed DCEP directly to users, it would bring single-point-of-failure risks and pull

## The PBOC wants to tap the private sector's well-established technological innovation and operational prowess.

business away from private financial institutions, thus disintermediating the commercial banking sector. Also, the PBOC wants to tap the private sector's well-established technological innovation and operational prowess, particularly given the size and complexity of China's economy and the nation's vast geography.

A PowerPoint slide presented by Yao in 2018 illustrates the two-tier structure succinctly.<sup>55</sup> It shows commercial banks obtaining the digital currency from the central bank and providing it to users through software applications. The currency circulates between users on the application rails offered by the private banks.

[See page 9 of Yao Qian's 2018 presentation demonstrating the two-tiered CBDC system.](#)

Another slide details the differences in responsibility between the two tiers. It presents the central bank as responsible for verifying ultimate ownership of the digital currency, liquidity management of supply, anti-money laundering, auditing, and big-data analysis of the entire system. Commercial banks will conduct know-your-customer and data analysis of their users, process payments, and manage the users' wallets, as well as facilitate withdrawals and deposits.

[See page 10 of Yao Qian's 2018 presentation demonstrating the proposed business framework of the two-tiered CBDC system.](#)

### DCEP Likely to Have No Blockchain Elements

Rather than unveiling a fully developed DCEP, the PBOC appears to be designing just the basic technical rails for the digital currency and relying on private sector market competition to determine the particulars.

PBOC officials since late 2019 have stressed that they are being “technologically neutral.”<sup>56</sup> The bank has assessed previous technological waves and is wary of premature investments that could be undermined by further innovation. Former PBOC governor Zhou remarked in a speech in 2019 to Tsinghua University’s School of Finance that the bank made mistakes in the 1980s, such as overinvesting in satellite technology when terrestrial communications were deemed too expensive<sup>57</sup>—terrestrial communication costs soon dropped significantly when fiber optic cables developed. Similarly, the PBOC invested heavily in massive physical data storage centers in the 1990s, only to have those facilities become less needed as cloud computing arose. Thus, the PBOC is aware of the vagaries of technological shifts and reluctant to put all its eggs into one technology basket.

Although the DCRI focused heavily in 2017 and 2018 on blockchain, or distributed ledger technology (DLT), more recent PBOC statements show the bank steering away from DLT for its digital currency. When Yao headed the DCRI, his public research proposed a CBDC that would rely on DLT and core nodes controlled by the central bank.<sup>58</sup> Some PBOC patents filed during that time emphasize DLT.<sup>59</sup> However, Mu—formerly the PBOC’s deputy director of payments and settlement—who replaced Yao, said in September 2019, “Whether it is a blockchain or a centralized

account system, electronic payment or so-called mobile money, the central bank can adapt to any technological route you take.”<sup>60</sup> But Mu was inflexible in one element of design: that the chosen system must support at least 300,000 transactions per second. Alipay, a Chinese third-party mobile payment platform established by Alibaba Group, reportedly can handle as high as 250,000 transactions per second.<sup>61</sup>

Later, in November 2019, Mu said on a panel at Hong Kong FinTech Week, “Our prototype was actually based on pure DLT, but then we found that the DLT is not suitable for our [digital currency].”<sup>62</sup> In February 2020, Mu wrote that blockchain technology would not work “for high-concurrency scenarios such as traditional retail payment.”<sup>63</sup> Instead, he stressed that the DCRI planned to push blockchain innovation solely for financial applications with lower transaction volume such as trade financing, supply chain management, and digital invoice trading.

The biggest indication that DCEP’s complete technical design remains somewhat undetermined is that Chinese regulators have offered contradictory proposals about DCEP. Although Yao moved to become the head of the

China Securities Depository and Clearing Corporation in late 2018, he still penned an article in April 2020 proposing ways that CBDC could use blockchain technology without eliminating central bank control.<sup>64</sup> Industry press noted that the PBOC had not shown any signs of taking on Yao’s more recent proposal.<sup>65</sup>

There have been numerous press reports about DCEP describing it as structured as “one coin, two repositories [also translated as “vaults” or “addresses”], and three centers.”<sup>66</sup> The coin would be the digitized renminbi itself. The two repositories are described as separate data storage entities: one for the central bank and another for commercial banks. The central bank also reportedly would run the three centers: a registration center to record identities of CBDC users, an authentication center to manage identity control of users and financial institutions, and a big data analysis center to track systemwide behavior to identify illegal transactions.<sup>67</sup> However, while this model clearly was the construct for the DCEP prototype, it may not be a precise blueprint moving forward. Mu Changchun dismissed the idea when he stressed DCEP’s technological neutrality in 2019.<sup>68</sup>

In early 2020, Chinese researchers Yang Xiaochen and Zhang Ming, both associated with state-affiliated academic institutions, reviewed many of the PBOC’s DCEP-related patents and noted that “the actual system is still in the R&D and testing stage, and

the system framework and interaction process are still highly confidential.”<sup>69</sup> Aspects of DCEP are clearly still being fleshed out, and PBOC patents simply are snapshots showing the experimentation process.<sup>70</sup> Yang and Zhang surmised that the initial prototype patent focuses on the central bank’s internal operations whereas later patents show the prototype’s refinement and DCEP’s outer-layer interactions.

The PBOC’s more recent patents illustrate four components, as Yang and Zhang point out: a central management system, digital currency issuance system, quota control system, and currency terminal.<sup>71</sup> In this framework, the central bank provides quotas for disbursement of digital currency to commercial banks, based on some specifications. When a user wants to send an amount of DCEP to another user, the system does not transfer it per se, but erases the amount in that user’s account and makes the same amount available to the new user. Yang and Zhang assessed this method as a “compromise between traceability and storage space requirements.” The evolving design most likely reflects the PBOC’s aim to ensure DCEP sustains high volume for everyday retail transactions.

## According to the PBOC, DCEP must support at least 300,000 transactions per second.

### DCEP Likely to Have Some Programmability

For users, DCEP's most relevant innovation will likely come from the currency's programmability, something conventional electronic payments mostly lack. PBOC officials stress that "smart" contracts as part of the DCEP code will be minimal, given the tradeoff between currency programmability and transactional throughput. This means that intricate programming will not be possible as it is with such blockchain-based digital currencies as Ethereum, where the code enables a range of potentially complex operations.<sup>72</sup> Nevertheless, DCEP will still be mathematical code. As Yang and Zhang note, DCEP essentially is a "string of numbers."<sup>73</sup> This means that commercial banks and payment interface companies should be able to introduce programmable applications around DCEP and its transactions.

For example, software developers will likely be able to write separate programs to make DCEP micropayments, transactions in smaller amounts than possible in conventional electronic payments. The smallest unit of renminbi is one fen. Parties today are unable to transact in half a fen, just as U.S. dollar holders cannot purchase something for half a penny. As a digital currency, DCEP will not have such limitations.



*Zhao Leji (left), politburo member and current chair of the Central Commission for Discipline Inspection (CCDI), participates in the second plenary meeting of the second session of the 13th National People's Congress. The CCDI is a major influencer in China's DCEP development. (Lintao Zhang/Getty Images)*

## Commercial banks and payment interface companies should be able to introduce programmable applications around DCEP transactions.

The innovations will come more from the ability to write computer commands where DCEP is simply an input in the program, rather than programming the DCEP code itself. For example, developers may be able to program if-then actions in which payments execute according to basic conditions specified in code. Commands might involve executing payments according to precise times or other external milestones or reference data. However, just as many smartphone applications used today were inconceivable while the smartphone did not exist, new programs and applications involving DCEP payments may not be identified until DCEP is launched and used widely.

### Users to Transact with DCEP through Software Wallets

One aspect of DCEP's operation is definitive: users will spend the currency through digital wallets. These wallets will be software applications built on personal devices such as smartphones. Leaked proof-of-concept screenshots of the DCEP app put to trial by the Agricultural Bank of China show it with QR codes and barcodes for sending and receiving payments.<sup>74</sup>

Unlike conventional bank accounts, DCEP wallets will also likely reside within internet of things devices, including home and vehicle sensors. Mu in 2020 posited an example where a car's license plate could be assigned its own software wallet, which would pay the vehicle's toll and parking fees.<sup>75</sup> In theory, this level of customization would enable significant innovation in the Chinese payments space, expanding on the already advanced cashless payment applications that private firms offer in the country.

The PBOC intends for DCEP wallets to allow offline payments<sup>76</sup>—that is, transactions between devices even if they lack an internet connection at the time. Parties reportedly will be able to transact simply by tapping each other's phones.<sup>77</sup> This means that users could spend DCEP while in no-signal areas such as remote rural villages, airplanes, or underground parking.<sup>78</sup>

## Strengthening the CCP's Hand

DCEP is likely to be a boon for CCP surveillance in the economy and for government interference in the lives of Chinese citizens. DCEP transactions will contain precise data about users and their financial activity, all easily accessible to the PBOC. The central bank—as the registrar and verifier of the digital currency—will likely be able to cut off access to DCEP funds in order to punish or coerce any user. The CCP has already begun to increase its punitive powers within the central bank, running an internal team from the Central Commission for Discipline Inspection (CCDI) within the PBOC that investigates graft.<sup>79</sup> DCEP would help the CCP solidify authoritarian control and crackdowns on dissident groups.

### Exploiting DCEP Big Data

The most valuable asset that the PBOC will gain by deploying DCEP is big data. Former governor Zhou remarked that “the financial industry is essentially an information industry,” pointing out that data processing drives key activities such as pricing financial products and stock trading.<sup>80</sup> China released a three-year fintech development plan in late 2019, prioritizing big data and artificial intelligence for the financial sector.<sup>81</sup> The plan calls on the country to advance “a new pattern of financial data fusion application and promote the construction of a nationwide integrated big data center.”<sup>82</sup>

The digital renminbi will essentially be a data set containing an array of information about transactions and users. PBOC modeling of DCEP shows that each digital currency token held by users would be constructed with a cryptographic algorithm expression, with various data inputs, such as information on the owner of the token.<sup>83</sup> Not all of the data will be available to those transacting

**The PBOC will become a possessor of a significant data trove to combine with its tools for censoring and surveilling individuals.**

in DCEP, but they will all be available to the central bank, according to its early proposed design sketches and most technical reports about DCEP.<sup>84</sup> PBOC officials have stressed that the new currency will protect privacy between users, but that the central bank will be able to analyze transactions to identify perpetrators of crime.<sup>85</sup> Mu has remarked that the digital currency will strike

a balance between securing privacy and allowing for authorities to combat money laundering, tax evasion, and terrorist financing.<sup>86</sup> As an example, he noted that the DCEP system's artificial intelligence will be able to monitor for illegal gambling by taking into consideration transactions with gambling-like patterns happening late at night.<sup>87</sup>

But DCEP data offers China more than just finer-tuned monetary policy and improved anti-money laundering. It will give the CCP unparalleled insight into the Chinese peoples' personal finances and significant levers to carry out punitive state action. In addition to basic information about users and transactions, it is possible that various metadata associated with users' movements and devices could also be infused with such big data. The PBOC will become a possessor of a significant data trove to combine with its tools for censoring and surveilling individuals.

### Controlling Anonymity

PBOC officials have described DCEP's user privacy as “controllable anonymity” since at least early 2018.<sup>88</sup> Yao later elaborated on the term, explaining it as a “front-end voluntary, back-end real name” system.<sup>89</sup> Users will be able to reveal their identities to counterparties or not, but will have to register their real names in order to use the currency in most cases. The only way to use a wallet without providing identity information will be for small transactions, according to Mu.<sup>90</sup> This means that the PBOC will place transaction limits on truly anonymous wallets and probably use transaction monitoring to guard against users trying to disguise a large transaction by breaking it up into smaller ones below the limits. To transact above the limits, users will have to register. Thus, the PBOC will be able to “achieve traceability under certain conditions and ensure that regulatory technologies such as big data analysis are useful.”<sup>91</sup> Yao summed up how the CBDC will give the PBOC unparalleled access to the public. In his 2018 paper, he wrote that a CBDC would “cut intermediary links in currency operation. In this way, central banks are able to reach out to end users, offering a new way for economic control.”<sup>92</sup>

Although the PBOC will know users' identities, precisely how this process will work is unclear. The PBOC may or may not have access to such data instantaneously. Deputy Governor Fan Yifei commented in early 2018 that the companies that issue the digital currency to users would send all transactional data to the PBOC daily.<sup>93</sup> However, most PBOC descriptions of a proposed CBDC structure describe the central bank as the repository of all DCEP data. For example, Yao's 2018 slide presentation includes a table showing the central bank having data

access on all DCEP clients.<sup>94</sup> No matter how DCEP is finally implemented, the PBOC will most likely retrieve and analyze all transaction data regularly, as a matter of course. DCEP will streamline and centralize the bank's access to information that it currently cannot collect directly from transactions moving through China's third-party payment companies, such as Ant Financial and Tencent.<sup>95</sup>

See graphic on controllable anonymity on page 22 of Yao Qian's 2018 presentation, which shows the PBOC with full access to digital currency data.

Controlled anonymity will be a new tool in the authoritarian toolkit. No central bank or financial institution in the world has had such universal access to financial data before. Privacy laws in democratic nations and all major market economies prevent this kind of intrusive collection of data. And authoritarian states have never been able to fully apply technology to collect such minute financial information on their citizens.

### **Deploying DCEP to Tighten Grip on Party and Public**

DCEP is likely to become a critical CCP instrument for enforcing top-down control on party officials, especially. In June 2020, the CCDI posted an article explaining that DCEP would help counter bribery and corruption and other crimes that "cannot be tolerated."<sup>96</sup> Citing Mu, the article explains how DCEP would enable better "funds tracking" with users' real names attached to transactions of interest. Since 2012, President Xi Jinping has intensified efforts to crack down on party corruption and misconduct.<sup>97</sup> Xi's campaign has helped to consolidate party power and would benefit from a centralized method to monitor and interdict transactions by party members.<sup>98</sup>

Most likely, the CCP will infuse its social credit system into DCEP. The government already keeps a list of "unreliable" persons and entities, which affects citizens' access to real estate, insurance, and other financial products.<sup>99</sup> In September 2020, the manager of the China Construction Bank's fintech lab spoke on a virtual panel and stated that the fintech projects her group was developing would incorporate China's "blacklist."<sup>100</sup> Recently, residents in Inner Mongolia expressed that local officials threatened to take away jobs and social security benefits of parents who kept their children home from school in protest of new state restrictions on Mongolian language instruction.<sup>101</sup> The local CCP authorities declared that those violating this restriction would be placed on the list of unreliable persons.<sup>102</sup> The PBOC is already testing DCEP as a way to disburse government salaries and

subsidies. The bank's centralized monitoring and control of DCEP wallets would make it easier for it to cut off users' ability to transact.

### **Seeking Renminbi Internationalization**

Although China will likely be able to compel DCEP adoption domestically, doing so internationally will be difficult and contingent on many external factors. Although the government's desired level of renminbi internationalization is unrealistic in the near future, Beijing will likely pursue a number of measures to promote international DCEP adoption. It may encourage foreign tourists to use DCEP wallets in the country and also may be able to compel Chinese students and tourists abroad to pay for Chinese goods and services with digital renminbi wallets.<sup>103</sup> However, such activity is unlikely to cause massive foreign adoption. Consistently, Chinese tech applications that are popular domestically have faced stiff competition in developed economies.<sup>104</sup> Foreign companies are reluctant to use renminbi in financial transactions because of China's strong capital controls<sup>105</sup> and because the yuan settlement system is not connected with China's foreign exchange settlement system.<sup>106</sup> Beijing has been trying to overcome this issue by making its currency more accessible and transactable across borders.



*Beijing could seek to get foreign companies to pay in renminbi to Chinese firms through DCEP cross-border transactions, which would bypass the U.S.-dollar-dominant foreign exchange process and could be monitored more closely by the PBOC. (Getty Images)*

Whereas international retail adoption of DCEP may be a challenge for China, the country may have more sway in building business-to-business use of DCEP across borders. China has been pushing to internationalize the renminbi and simplify cross-border payments in support of its Belt and Road Initiative, which touches 138 countries.<sup>107</sup> However, the majority of Belt and Road projects continue primarily to use the U.S. dollar.<sup>108</sup> China accounts for roughly a fifth of global GDP, but the renminbi represents only about 2 percent of international payments.<sup>109</sup> Although Chinese officials have not publicly spelled out a strategy for leveraging DCEP for the Belt and Road Initiative or for displacing the U.S. dollar as an international reserve currency, DCEP's ease of cross-border use would appear to provide some support for that aim.

In the current renminbi issuance model, commercial banks enter into repurchase agreements with the PBOC to borrow or return liquid assets through mortgage of eligible assets.<sup>110</sup> It appears likely that Beijing will seek to encourage foreign companies to pay renminbi to Chinese firms through DCEP cross-border transactions and eliminate the U.S.-dollar-dominant foreign exchange process. China is already promoting increased renminbi use for cross-border transactions under Belt and Road.<sup>111</sup> For example, China expanded bilateral local-currency swap programs to over 20 countries and established renminbi settlement banks in eight Belt and Road nations, seemingly to promote renminbi use over the use of the U.S. dollar.<sup>112</sup> Additionally, China established 56 economic cooperation zones and 12 free-trade agreements with more than 10 Belt and Road countries in Europe and Asia. An increase in service invoices charged in renminbi may encourage participating Belt and Road nations to incorporate renminbi into their own national bank currency reserves.

One Chinese financial services entrepreneur opined that DCEP will be a “magic weapon” against the perceived overreliance on U.S. currency abroad.<sup>113</sup> A shift away from the dollar will be accelerated if firms in Belt and Road Initiative countries agree to this payment method. Success, however, will depend on variables such as other countries' overall preference for the renminbi, trust in DCEP, and long-term alignment with Belt and Road Initiative projects. However, small-scale import-export traders in some countries are likely to find DCEP quite helpful for their day-to-day business. Press reporting shows that Nigerian businesses that import Chinese supplies often use bitcoin for their purchases.<sup>114</sup> Some Nigerians say that the cryptocurrency, despite its volatility, is more effective for cross-border

transactions with China because it is difficult getting sufficient Chinese foreign exchange through the Central Bank of Nigeria.<sup>115</sup> If Nigerian traders are able to acquire DCEP, it will likely facilitate seamless payments to Chinese suppliers.

Other digital currency projects in the region could bolster DCEP's internationalization. In particular, one Chinese tech investor who serves on the National Committee of the People's Consultative Conference proposed a “Hong Kong–based cross-border stablecoin” to settle transactions between China and Hong Kong, Japan, and South Korea.<sup>116</sup> It is plausible that DCEP would be the Chinese asset for such a multi-currency basket and would help integrate DCEP into Hong Kong finance. This effort is separate from the PBOC's planning, and it is only a proposal. But it would complement a broader push by the CCP to strengthen Hong Kong's economic ties with the mainland.<sup>117</sup>

**These efforts may provide marginal benefits in internationalizing the renminbi over time, but they are unlikely to offset the larger economic and political impediments that make China's currency less practical for international transactions.**

Also, in mid-2020, the managing director of the Monetary Authority of Singapore mentioned that Singapore was discussing ways to collaborate with the PBOC on digital currency.<sup>118</sup> Singapore is prioritizing CBDC innovation as a way to make cross-border payments more efficient and secure. For the past few years, the Monetary Authority of Singapore has been piloting CBDC technology between other central banks as part of this aim.<sup>119</sup> Although wary of Chinese financial dominance in its economy, Singapore has been open to strategic economic partnerships, including the promotion of renminbi internationalization.<sup>120</sup>

Overall, these efforts may provide marginal benefits in internationalizing the renminbi over time, but they are unlikely in the short term to offset the larger economic and political impediments that make China's currency less practical for international transactions.



## Testing and Implementation

The PBOC began testing its digital currency in April 2020, with pilot programs in four Chinese cities: Shenzhen, Suzhou, Chengdu, and Xiong'an.<sup>121</sup> In August 2020, China's Ministry of Commerce announced that the pilot program would eventually expand to Beijing, Tianjin, Guangdong province, and a number of other regions in central and western China.<sup>122</sup> Initial trials of DCEP involved the Chinese government's providing portions of local civil servants' travel subsidies in digital currency.<sup>123</sup> In October 2020, PBOC Deputy Governor Fan Yifei revealed in a speech that the equivalent of \$162 million in transactions had been processed as part of the pilot program.<sup>124</sup> Although some statements from officials imply DCEP is now ready for full implementation, a body of reporting suggests that testing remains in its early phases.<sup>125</sup> In fact, it appears the main goal is to prepare the DCEP for wider use, including by foreign visitors, during China's hosting of the 2022 Winter Olympics in Beijing.<sup>126</sup>

While initial testing is focused on providing the digital currency directly to public employees, a number of major financial companies and non-financial corporations are reportedly involved in broader DCEP implementation. At least five banks appear to be involved in some form

of testing. Various press reporting indicates that the Agricultural Bank of China, China Construction Bank, Industrial and Commercial Bank of China, and Bank of China—all state-owned banks—are key implementation partners for DCEP.<sup>127</sup> China Construction Bank also indicated to local press in China that it was testing an interface for DCEP.<sup>128</sup> Similarly, Yao's 2018 slide presentation also named Industrial and Commercial Bank of China and Bank of China, along with other banks, as key partners for testing DCEP system.<sup>129</sup>

In addition to banks, a number of technology companies are supporting DCEP implementation as part of its planned two-tiered structure. Press reporting indicates that Ant Financial's Alipay and Tencent's WeChat Pay, the two dominant mobile payments platforms in China, are likely to be involved in facilitating access to DCEP, and Ant Financial executives have confirmed they are involved in discussions with PBOC officials about the project.<sup>130</sup>

Additionally, in early July 2020, Didi—the major ride sharing app in China—announced it had agreed to a cooperation agreement with the PBOC to explore the possibility of integrating DCEP into its platform.<sup>131</sup> Meituan, a major food delivery platform in China backed by Tencent, announced in July that it was similarly exploring ways to fuse the CBDC into its platform.<sup>132</sup>



Deputy Governor of the People's Bank of China Fan Yifei (left) attends a 2022 Olympic Games commemorative coin-issuing ceremony in Beijing. The PBOC views the 2022 Winter Olympics as a key milestone for promoting wider use of DCEP. (Lintao Zhang/Getty Images)

Also, Chinese e-commerce firm JD.com is reportedly working with the PBOC to develop apps to support the DCEP.<sup>133</sup> These collaborations allow the PBOC to leverage the significant resources and expertise of major banks and technology firms in catering to consumers, which the PBOC is less equipped to do.

The PBOC wants DCEP ready for more widespread use during the 2022 Winter Olympics, but the small scale of the current pilot program, the difficulty in replacing physical currency, and the size of China's financial system make it unlikely that DCEP will be universally implemented within two years.<sup>134</sup> It is more likely that a rollout of DCEP will occur in stages over several years, with an extended period of time before it is fully integrated into the financial system.

Although the PBOC is keeping blockchain out of DCEP, other powerful organs of the government are building capacity to make China a global leader in the technology. This blockchain push, though happening away from DCEP, is another example of China's outpacing its global competitors in new technology. Xi announced at a Politburo meeting in late 2019 that he considered blockchain technology a core innovation that he wanted to see accelerated in China.<sup>135</sup> In early 2020, the State Information Center, part of China's economic planning apparatus, created the Blockchain-Based Service Network

similar to the bifurcated system China has for its broader internet use.<sup>140</sup> Global developers will be able to create such permissionless blockchains for activity outside China, however.

BSN is China's investment in an alternative technological platform that it assumes will become critical for the economy of the future. Several international blockchain projects, including ones led by mostly Western blockchain developers, are integrating with BSN's data backbone.<sup>141</sup> And outside of the relatively new push with BSN, Chinese state institutions since 2016 have launched an array of non-digital currency-related blockchain projects, including those for trade finance, accounts receivable lending, and electronic invoicing.<sup>142</sup> Beijing's municipal government released a plan for the city to become a blockchain hub by 2022, coinciding with the Winter Olympics.<sup>143</sup> While not directly related to the CBDC, these efforts reflect China's aim of building a cohesive digital economy, which would be powered by DCEP.

**Although the PBOC is keeping blockchain out of DCEP, other powerful organs of the government are building capacity to make China a global leader in the technology.**

(BSN), a project that offers cloud data platforms to support distributed ledger technology development.<sup>136</sup> China is promoting BSN as the back-end tech for blockchain developers around the world to build applications.<sup>137</sup> BSN claimed in a blog post that its network costs would be cheaper than blockchain developers would find elsewhere.<sup>138</sup> BSN has an English-language website, but it is essentially "one network, two systems."<sup>139</sup> The Chinese government is constructing the network so that domestic users will not be able to access any permissionless applications on it, given Beijing's ban on trading permissionless blockchain tokens, such as bitcoin. This system is

## Policy Recommendations

China's progress in building a CBDC shows that new technological shifts in global finance are not likely to remain on the fringes. The United States may not find an advantage in creating its own digital fiat currency, but it should have a strategy for addressing the national security and financial stability implications of other countries' doing so. China's advance in DCEP could give it leverage in influencing other nations' CBDC or other payment system pursuits. Such influence could undermine U.S. efforts to support global standards around financial integrity, privacy, and political freedom. The following are steps U.S. policymakers should undertake to respond to the rise of the CCP's digital currency effort.

### Mount a diplomacy campaign urging Chinese government transparency and restraint in using DCEP for punitive measures.

The U.S. Department of State should launch a messaging campaign that calls for the Chinese government to explain publicly how DCEP user data are collected and managed. Also, the State Department should track and highlight cases where the PBOC infringes on human rights by censoring user transactions. The United States should support nongovernmental organizations that raise awareness about DCEP's authoritarian impact on Chinese citizens.

### Monitor risks from DCEP data collection on U.S. persons.

Since using DCEP means directly providing personal data to the CCP, U.S. officials should be as concerned about DCEP's collecting data in the United States as they have been about the social media app TikTok acquiring Americans' personal information—if not more. An outright ban on Americans' use of DCEP is probably not feasible, because many Americans with relatives in China may need to rely on the platform, just as they rely on Chinese payment apps, such as Alipay and WeChat, to send money to family. U.S. policymakers should assess whether DCEP use in the United States begins to extend much beyond Chinese diaspora communities and, if so, whether it is appropriate for the U.S. Department of Commerce to institute measures to restrict DCEP usage or broader, general restrictions on how financial data from U.S. persons can be collected by foreign entities. One key development to watch out for would be a significant rise in the internationalization of the renminbi, which would likely also increase DCEP's global adoption.

### Prioritize CBDC developments within the U.S. national security apparatus.

The White House National Security Council, in coordination with the National Economic Council, should ensure that the U.S. National Security Strategy clearly defines the risks arising from CBDC deployments and lays out the U.S. direction for assisting, influencing, or responding to such efforts. In considering CBDCs as a security issue, the U.S. should articulate how it will continue to help maintain the integrity of the global financial system should they become more common. Also, the U.S. Department of the Treasury should ensure that the National Illicit Finance Strategy treats CBDCs as an emerging component of the international finance system and evaluates their illicit finance risks.<sup>144</sup>

### Assess the U.S. private sector's ties to China's digital financial authoritarianism.

Many U.S. companies are intertwined with China's technology industry as investors, partners, subsidiaries, or recipients of Chinese private investment. The Commerce Department's Bureau of Industry and Security, in close coordination with the U.S. intelligence community and Treasury Department, should identify and track the Chinese tech firms significantly involved with DCEP design and implementation. They should assess whether it is appropriate to introduce actions to require disclosure or licensing of U.S. firms involved with fintech tools, such as DCEP, that directly strengthen the CCP's authoritarian activities and restriction of human rights, or otherwise to limit or unwind those firms' involvement. And while assessing U.S. private sector ties to China's digital financial system, the U.S. government should also listen to U.S. firms' perspectives about any push factors drawing U.S. investors and talent to Chinese financial technology ventures over domestic ones—and consider ways to foster more local fintech innovation. Also, U.S. financial regulators should solicit and incorporate expertise from the private sector in responding to CBDC developments from China.

### Lead CBDC standard-setting.

Even if the United States chooses not to launch a CBDC in the near future, the Federal Reserve should continue its research on CBDCs, and the United States should provide leadership in the international discourse and planning around them. Recently, the Bank of International Settlements released a report, written

by eight banks, that outlined motivations and risks of developing CBDCs.<sup>145</sup> The United States should work with other market economies by engaging with other central banks and should build on that work to articulate a framework around CBDC design that goes beyond technical standards. The framework should prioritize protection of personal privacy and safeguard against government abuse of user data, in tandem with global standards for anti-money laundering and combating the financing of terrorism. This framework should be promoted as an alternative to the digital authoritarianism in the CCP's DCEP model.

### **Fine-tune economic statecraft for CBDCs.**

The U.S. Treasury Department's Office of Foreign Assets Control should examine the links to U.S. jurisdiction, even if remote, of DCEP and other CBDCs to evaluate whether and how the United States can apply sanctions tools to CBDCs. The U.S. Commerce Department's Bureau of Economic Analysis should study how trade-related enforcement actions against foreign CBDCs would affect the U.S. fintech sector. The departments should participate in joint tabletop scenario exercises simulating the challenges of implementing U.S. financial coercion tools in a financial system where many nations use CBDCs domestically and internationally. U.S. financial

## **China's advance in DCEP could give it leverage in influencing other nations' CBDC or other payment system pursuits.**

authorities should use the results of these exercises to identify any strategic or tactical adjustments needed in deploying economic statecraft. Also, the Office of the U.S. Trade Representative should study the ways international shifts to CBDCs might affect existing trade regulations and bilateral investment agreements. The U.S. Internal Revenue Service should also assess how foreign nations' CBDC accounts would affect U.S. tax evasion overseas and hinder or enhance foreign financial institutions' adherence to the Foreign Account Compliance Act.

### **Promote deeper academic research into the economic impacts of CBDC technology.**

The Bureau of Economic Analysis and the National Science Foundation's Division of Social and Economic Sciences should provide grants for graduate-level research into CBDCs. The topics of research should address implications for monetary policy, financial stability, employment, retail commerce, financial privacy, and financial access. Such grants should be offered as part of internships or fellowships for master's and PhD students in economics, finance, business, and computer science. Moreover, the two institutions should collaborate to establish cross-discipline research centers or initiatives in addition to individual grants, to take advantage of potential spillover effects from research clusters. They also should create a public education campaign to share the results of the research in order to familiarize public and private stakeholders with the economics around fintech developments and to encourage follow-on research and policy work.



*International financial organizations participate in an Organization for Economic Co-operation and Development regulatory forum in Beijing. The U.S. government should lead in standard-setting and regulation in the CBDC space to safeguard user data and comply with global anti-money laundering standards. (Lintao Zhang/Getty Images)*

## Conclusion

**A**lthough many operational details about China's DCEP are still evolving, it is clear that the rapidly advancing project is a key to the Chinese government's grand fintech strategy and is likely to enhance its digital authoritarianism. Although it is unlikely that the DCEP system will foster broader renminbi internationalization, absent other legal and economic reforms in China's financial system, it still poses serious risks to U.S. national security interests. DCEP will give China the lead in harnessing computer-science-based financial technology for its economy. The relatively real-time financial data and control afforded to the PBOC by the system will give the CCP greater control over private Chinese companies and citizens, both within China and abroad. As Beijing attempts to export DCEP and its related technology, all while many nations are exploring CBDCs, the Chinese government may gain powerful influence in the development of the future global financial system. These risks should serve as a call to action for U.S. policymakers, to better understand how CBDCs more broadly will function and to spearhead the development of standards around them, to closely monitor DCEP's launch, and to address the risks to data privacy and political freedom infringed upon by DCEP's growth. If the United States wants to counter China's growing digital authoritarianism, it must adapt economic statecraft to address the technologies transforming the global financial system.

1. “Fintech Will Be the Commanding Heights of Global Financial Competition in Future: PBOC Vice-Governor Fan Yifei,” *China Banking News*, November 29, 2019, [www.chinabankingnews.com/2019/11/29/fintech-will-be-the-commanding-heights-of-global-financial-competition-in-future-pboc-vice-governor-fan-yifei/](http://www.chinabankingnews.com/2019/11/29/fintech-will-be-the-commanding-heights-of-global-financial-competition-in-future-pboc-vice-governor-fan-yifei/).
2. Elsa Kania, Samm Sacks, Paul Triolo, and Graham Webster, “China’s Strategic Thinking on Building Power in Cyberspace,” *New America*, September 25, 2017, [www.newamerica.org/cybersecurity-initiative/blog/chinas-strategic-thinking-building-power-cyberspace/](http://www.newamerica.org/cybersecurity-initiative/blog/chinas-strategic-thinking-building-power-cyberspace/).
3. “Guiding Opinions on Expanding Investment in Strategic Emerging Industries and Cultivating Strengthened New Growth Points and Growth Poles,” Translated by Elsa Kania, Ngor Luong, Caroline Meinhardt, Ben Murphy, Dahlia Peterson, Helen Toner, Graham Webster, and Emily Weinstein, NRDC High Technology Document 1409 (Center for Security and Emerging Technology at Georgetown University and New America, September 29, 2020), <https://www.newamerica.org/cybersecurity-initiative/digichina/blog/new-chinese-ambitions-strategic-emerging-industries-translated/>.
4. “Opinion: China is exporting its digital authoritarianism,” *The Washington Post*, August 5, 2020, [www.washingtonpost.com/opinions/china-is-exporting-its-digital-authoritarianism/2020/08/05/f14df896-d047-11ea-8c55-61e7fa5e82ab\\_story.html](http://www.washingtonpost.com/opinions/china-is-exporting-its-digital-authoritarianism/2020/08/05/f14df896-d047-11ea-8c55-61e7fa5e82ab_story.html).
5. Christina Larson, “Who needs democracy when you have data?” *MIT Technology Review*, August 20, 2018, [www.technologyreview.com/2018/08/20/240293/who-needs-democracy-when-you-have-data/](http://www.technologyreview.com/2018/08/20/240293/who-needs-democracy-when-you-have-data/).
6. Samantha Hoffman, John Garnaut, Kayla Izenman, Matthew Johnson, Alexandra Pascoe, Fergus Ryan, and Elise Thomas, “The flipside of China’s central bank digital currency,” (Australian Strategic Policy Institute, October 2020), [www.aspi.org.au/report/flipside-chinas-central-bank-digital-currency](http://www.aspi.org.au/report/flipside-chinas-central-bank-digital-currency).
7. Hiroshi Murayama, “In China, cash is no longer king,” *Nikkei Asia*, January 7, 2019, [asia.nikkei.com/Business/Business-trends/In-China-cash-is-no-longer-king](http://asia.nikkei.com/Business/Business-trends/In-China-cash-is-no-longer-king).
8. People’s Bank of China, Payment and Settlement Department, “2019年支付体系运行总体情况 [2019 Overview of Payment System Operation],” People’s Bank of China, [www.pbc.gov.cn/zhifujiesuansi/128525/128545/128643/3990497/index.html](http://www.pbc.gov.cn/zhifujiesuansi/128525/128545/128643/3990497/index.html).
9. “Transcript of Governor Zhou Xiaochuan’s Exclusive Interview with Caixin Weekly,” People’s Bank of China, February 14, 2016, [www.pbc.gov.cn/english/130721/3017134/index.html](http://www.pbc.gov.cn/english/130721/3017134/index.html).
10. Fan Yifei, “On Digital Currencies, Central Banks Should Lead,” *Bloomberg*, September 1, 2016, [www.bloomberg.com/opinion/articles/2016-09-01/on-digital-currencies-central-banks-should-lead](http://www.bloomberg.com/opinion/articles/2016-09-01/on-digital-currencies-central-banks-should-lead).
11. Fan, “On Digital Currencies, Central Banks Should Lead.”
12. Fan, “On Digital Currencies, Central Banks Should Lead.”
13. Yao Qian, “Central Bank Digital Currency: Optimization of the currency system and its issuance design,” *China Economic Journal*, 12 no. 1 (January 17, 2019), <https://www.tandfonline.com/doi/abs/10.1080/17538963.2018.1560526?journalCode=rcej20>.
14. Alun John, “China’s digital currency not seeking ‘full control’ of individuals’ details: central bank official,” *Reuters*, November 12, 2019, [uk.reuters.com/article/us-china-markets-digital-currency/chinas-digital-currency-not-seeking-full-control-of-individuals-details-central-bank-official-idUKKBN1XM0H2](http://uk.reuters.com/article/us-china-markets-digital-currency/chinas-digital-currency-not-seeking-full-control-of-individuals-details-central-bank-official-idUKKBN1XM0H2).
15. Danny Nelson, “Canada’s Central Bank Is Serious About Designing a CBDC, Job Posting Reveals,” *CoinDesk*, June 16, 2020, [www.coindesk.com/bank-of-canada-central-bank-digital-currency-project-manager](http://www.coindesk.com/bank-of-canada-central-bank-digital-currency-project-manager).
16. Yao, “Central Bank Digital Currency.”
17. Yao Qian, “A systematic framework to understand central bank digital currency,” *Science China Information Sciences*, 61 no. 3 (January 3, 2018), [engine.scichina.com/publisher/scp/journal/SCIS/61/3/10.1007/s11432-017-9294-5?slug=fulltext](http://engine.scichina.com/publisher/scp/journal/SCIS/61/3/10.1007/s11432-017-9294-5?slug=fulltext).
18. Yao, “Central Bank Digital Currency.”
19. Zennon Kapron, “China’s Central Bank Digital Currency Will Strengthen Alipay And WeChat Pay, Not Replace Them,” *Forbes*, May 24, 2020, [www.forbes.com/sites/zennonkapron/2020/05/24/chinas-central-bank-digital-currency-will-strengthen-alipay-and-wechat-pay-not-replace-them/](http://www.forbes.com/sites/zennonkapron/2020/05/24/chinas-central-bank-digital-currency-will-strengthen-alipay-and-wechat-pay-not-replace-them/).
20. Yaya J. Fanusie, “Regulators Struggling to Handle Illicit Finance Risks of Fintech Innovation,” *Foundation for Defense of Democracies*, September 20, 2017, [www.fdd.org/analysis/2017/09/20/regulators-struggling-to-handle-illicit-finance-risks-of-fintech-innovation/](http://www.fdd.org/analysis/2017/09/20/regulators-struggling-to-handle-illicit-finance-risks-of-fintech-innovation/).
21. Yao Qian, “Technical Aspects of CBDC in a Two-Tiered System,” (slide presentation at the United Nations International Telecommunication Union Workshop on Standardizing Digital Fiat Currency and Its Applications, New York City, July 18–19, 2018), [www.itu.int/en/ITU-T/Workshops-and-Seminars/20180718/Documents/Yao%20Qian.pdf](http://www.itu.int/en/ITU-T/Workshops-and-Seminars/20180718/Documents/Yao%20Qian.pdf).
22. “The next war: The growing danger of great-power conflict,” *The Economist*, January 25, 2018, [www.economist.com/leaders/2018/01/25/the-growing-danger-of-great-power-conflict](http://www.economist.com/leaders/2018/01/25/the-growing-danger-of-great-power-conflict).
23. Shaurya Malwa, “People’s Bank of China Recommends Yuan-Pegged Stablecoin,” *CryptoSlate*, October 12, 2018, [cryptoslate.com/peoples-bank-of-china-recommends-yuan-pegged-stablecoin/](http://cryptoslate.com/peoples-bank-of-china-recommends-yuan-pegged-stablecoin/).

24. A stablecoin is a crypto asset that aims to maintain a stable value relative to a specified asset, or a pool or basket of assets, according to the Financial Stability Board, an international body that monitors and makes recommendations about the global financial system. For more on the definition of and other regulatory issues raised by stablecoins, see “Addressing the regulatory, supervisory and oversight challenges raised by ‘global stablecoin’ arrangements,” Financial Stability Board, April 14, 2020, <https://www.fsb.org/wp-content/uploads/P140420-1.pdf>.
25. “‘Libra Is Not a Match For China’s Digital Currency’ – PBoC Digital Director,” CoinNewsExtra, September 12, 2019, [coinnewsextra.com/libra-is-not-a-match-for-chinas-digital-currency-pboc-digital-director/amp/](http://coinnewsextra.com/libra-is-not-a-match-for-chinas-digital-currency-pboc-digital-director/amp/).
26. For a post on the conference, see ChaosTheory, “头条文章” [Headline Article], Weibo, October 31, 2019, [card.weibo.com/article/m/show/id/2309404433498915078247](http://card.weibo.com/article/m/show/id/2309404433498915078247); for Huang Qifan’s remarks, see “黄奇帆 - 学术研究” [Huang Qifan, Academic Research], 中国国际经济交流中心 [China Center for International Economic Exchange], [www.cciee.org.cn/ExpertDetail.aspx?newsId=16355](http://www.cciee.org.cn/ExpertDetail.aspx?newsId=16355).
27. Miranda Wood, “China ‘likely to be the first’ to issue central bank digital currency, says official,” Ledger Insights, October 29, 2019, [www.ledgerinsights.com/china-first-issue-central-bank-digital-currency/](http://www.ledgerinsights.com/china-first-issue-central-bank-digital-currency/).
28. Laura Shin, “Why China Aims to Replace Cash With the Digital Yuan,” Unchained Podcast, November 23, 2019, [unchainedpodcast.com/why-china-aims-to-replace-cash-with-the-digital-yuan/](http://unchainedpodcast.com/why-china-aims-to-replace-cash-with-the-digital-yuan/).
29. Codruta Boar, Henry Holden, and Amber Wadsworth, “Impending arrival—a sequel to the survey on central bank digital currency,” BIS Paper No. 107 (Bank for International Settlements, January 2020), [www.bis.org/publ/bppdf/bispap107.htm](http://www.bis.org/publ/bppdf/bispap107.htm).
30. Sarah Allen, James Grimmelman, Ari Juels, and Eswar Prasad, “Design choices for central bank digital currency,” *Upfront* (blog) on The Brookings Institution, July 23, 2020, [www.brookings.edu/blog/up-front/2020/07/23/design-choices-for-central-bank-digital-currency/](http://www.brookings.edu/blog/up-front/2020/07/23/design-choices-for-central-bank-digital-currency/).
31. For Uruguay, see Nikhilesh De, “Uruguay’s Central Bank Announces New Digital Currency Pilot,” CoinDesk, September 22, 2017, [www.coindesk.com/central-bank-of-uruguay-president-announces-digital-currency-pilot-program](http://www.coindesk.com/central-bank-of-uruguay-president-announces-digital-currency-pilot-program); for Sweden, see Dylan Love, “Sweden Is Testing Its New Central Bank Digital Currency,” Cointelegraph, February 20, 2020, [cointelegraph.com/news/sweden-is-testing-its-new-central-bank-digital-currency](http://cointelegraph.com/news/sweden-is-testing-its-new-central-bank-digital-currency); for the Bahamas, see Danny Nelson, “The Bahamas Launches Digital Currency Pilot,” CoinDesk, December 26, 2019, [www.coindesk.com/the-bahamas-will-launch-a-digital-currency-pilot-tomorrow](http://www.coindesk.com/the-bahamas-will-launch-a-digital-currency-pilot-tomorrow).
32. “Central Bank Digital Currency: opportunities, challenges and design,” Bank of England, March 12, 2020, [www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper](http://www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper).
33. Sriram Darbha and Rakesh Arora, “Privacy in CBDC technology,” Bank of Canada, June 2020, [www.bankofcanada.ca/2020/06/staff-analytical-note-2020-9/](http://www.bankofcanada.ca/2020/06/staff-analytical-note-2020-9/).
34. Lael Brainard, “An Update on Digital Currencies” (webcast, Federal Reserve Board and Federal Reserve Bank of San Francisco’s Innovation Office Hours, San Francisco, California, August 13, 2020), [www.federalreserve.gov/newsevents/speech/brainard20200813a.htm](http://www.federalreserve.gov/newsevents/speech/brainard20200813a.htm).
35. Kollen Post, “Fed Chair on CBDC: ‘We Need to Understand It First and Best’—But Is He Too Late?” Cointelegraph, June 17, 2020, [cointelegraph.com/news/fed-chair-on-cbdc-we-need-to-understand-it-first-and-best-but-is-he-too-late](http://cointelegraph.com/news/fed-chair-on-cbdc-we-need-to-understand-it-first-and-best-but-is-he-too-late).
36. See “独家 | 证监会首设科技监管局，前央行姚前有望出任局长 [Exclusive | China Securities Regulatory Commission sets up the Science and Technology Regulatory Bureau for the first time],” Tuoluo Caijing, July 12, 2020, <https://www.tuoluocaijing.cn/article/detail-10017594.html>; Wood, “China ‘Likely to be the first’ to issue central bank digital currency, says official.”
37. Charlotte Gao, “China’s Top Anti-Corruption Organ Declares Safeguarding Xi’s Status Its Top Priority,” *The Diplomat*, February 23, 2019, <https://thediplomat.com/2019/02/chinas-top-anti-corruption-organ-declares-safeguarding-xis-status-its-top-priority/>.
38. Jamie Horsley, “What’s So Controversial About China’s New Anti-Corruption Body? Digging into the National Supervision Commission,” *The Diplomat*, May 30, 2018, <https://thediplomat.com/2018/05/whats-so-controversial-about-chinas-new-anti-corruption-body/>.
39. “视频 | 权威解读：央行数字货币如何助力治理腐败？ [Video | Authoritative Interpretation: How Can PBoC’s CBDC Help Manage Corruption?],” SinaNews.com, July 19, 2016, <https://news.sina.cn/gn/2020-06-19/detail-iirczymk7864016.d.html>.
40. Zhou Xiaochuan biography, ChinaVitae.com, [https://www.chinavitae.com/biography/Zhou\\_Xiaochuan](https://www.chinavitae.com/biography/Zhou_Xiaochuan).
41. This position ranks higher than Yi Gang’s position as Governor of the People’s Bank of China. For more, see Keith Bradsher, “China Splits Top Jobs at Central Bank, Adding Another Reformer,” *The New York Times*, March 25, 2018, <https://www.nytimes.com/2018/03/25/business/china-central-bank-guo-shuqing.html>.
42. “2020年中国人民银行工作会议在京召开 [The 2020 People’s Bank of China work conference was held in Beijing],” People’s Bank of China, January 5, 2020, <https://archive.vn/R7RGU>.
43. Yi Gang biography, ChinaVitae.com, [https://www.chinavitae.com/biography/Yi\\_Gang](https://www.chinavitae.com/biography/Yi_Gang).

44. Sidney Leng, "China appoints new digital currency head as race with Facebook's Libra heats up," *South China Morning Post*, September 6, 2019, <https://www.scmp.com/economy/china-economy/article/3026038/china-apoints-new-digital-currency-head-race-facebooks-libra>.
45. Wolfie Zhao, "PBoC's Digital Currency Chief Departs to Lead Securities Clearing House," *CoinDesk*, October 15, 2018, <https://www.coindesk.com/pbocs-digital-currency-chief-departs-to-lead-securities-clearing-house>.
46. Georgina Lee, "China's proposed digital currency will help banks bridge gap on mobile payment, curb dominance of Alipay, Wechat," *South China Morning Post*, August 19, 2019, <https://www.scmp.com/business/banking-finance/article/3023309/chinas-proposed-digital-currency-will-help-banks-bridge>.
47. "Ex-Bank of China Head Sheds Light on Digital Renminbi Trials and Schedules," *China Banking News*, August 28, 2020, <https://www.chinabankingnews.com/2020/08/28/ex-bank-of-china-head-sheds-light-on-digital-renminbi-trials-and-scheduling/>.
48. "China internet finance body suggests framework to support virtual currencies," *Reuters*, September 14, 2017, <https://www.reuters.com/article/bitcoin-china/china-internet-finance-body-suggests-framework-to-support-virtual-currencies-idUSS6NIL802B>.
49. "中联部原副部长预警，积极应对六大外部环境恶化的准备 [Former deputy minister of the International Liaison Department gives a warning, (makes) preparations for actively responding to six major deteriorations in the external environment]," *Chongyang Institute for Financial Studies*, June 29, 2020, [http://www.rdcy.org/index/index/news\\_cont/id/679918.html](http://www.rdcy.org/index/index/news_cont/id/679918.html).
50. "社保基金理事会原副理事长王忠民：数字货币DC/EP将呈现新业态 [China Social Security Fund Wang Zhongmin, Former Vice Chairman of the Social Security Fund: There Will be a New Format for Digital Currency DC/EP]," *Sina Finance*, June 22, 2020, <https://finance.sina.com.cn/blockchain/coin/2020-06-22/doc-iirczymk8284602.shtml>.
51. "Transcript of Governor Zhou Xiaochuan's Exclusive Interview with Caixin Weekly."
52. Cyrus Minwalla, "Security of a CBDC," *Bank of Canada*, June 2020, <https://www.bankofcanada.ca/2020/06/staff-analytical-note-2020-11/>.
53. Fan, "On Digital Currencies, Central Banks Should Lead."
54. "重磅！央行数字货币呼之欲出，设计理念和技术架构首次曝光（附穆长春演讲全文） [Big News! The Central Bank's Digital Currency is About to Emerge, and the Design Concept and Technical Architecture are Exposed for the First Time (Including Full Text of Mu Changchun's Speech)]," *ChainNews*, August 12, 2019, [www.chainnews.com/articles/441923590879.htm](http://www.chainnews.com/articles/441923590879.htm).
55. Yao, "Technical Aspects of CBDC in a Two-Tiered System."
56. Alun John, "China's digital currency will kick off 'horse race': central bank official," *Reuters*, November 5, 2019, [www.reuters.com/article/us-china-markets-digital-currency/chinas-digital-currency-will-kick-off-horse-race-central-bank-official-idUSKBN1XG0BI](http://www.reuters.com/article/us-china-markets-digital-currency/chinas-digital-currency-will-kick-off-horse-race-central-bank-official-idUSKBN1XG0BI).
57. "周小川，《中国金融》 | 周小川：信息技术与金融政策的相互作用 [Zhou Xiaochuan, "China Finance Zhou Xiaochuan: "Interaction of Information Technology and Financial Policy"]," Wechat public platform, *China Finance*, July 31, 2019, [mp.weixin.qq.com/s/sNbUbT7Lv2T-3PolBncxZsg](http://mp.weixin.qq.com/s/sNbUbT7Lv2T-3PolBncxZsg).
58. Yao, "A Systematic Framework to Understand Central Bank Digital Currency."
59. Allen et al., "Design choices for Central Bank Digital Currency," 165.
60. For text of Mu's remarks, see Dobiexchange, "重磅！央行数字货币呼之欲出，设计理念和技术架构首次曝光（附穆长春演讲全文） [Big News! The Central Bank's Digital Currency is About to Emerge, and the Design Concept and Technical Architecture are Exposed for the First Time (Including Full Text of Mu Changchun's Speech)]." For additional reporting, see Wolfie Zhao, "PBoC's Digital Currency Chief Departs to Lead Securities Clearing House," *CoinDesk*, October 15, 2018, [www.coindesk.com/pbocs-digital-currency-chief-departs-to-lead-securities-clearing-house](http://www.coindesk.com/pbocs-digital-currency-chief-departs-to-lead-securities-clearing-house).
61. "The Mobile Payments Race: Why China Is Leading the Pack—for Now," *Knowledge@Wharton*, January 17, 2018, [knowledge.wharton.upenn.edu/article/how-will-chinas-overseas-mobile-payment-systems-fare/](http://knowledge.wharton.upenn.edu/article/how-will-chinas-overseas-mobile-payment-systems-fare/).
62. "Blockchain not suitable for China's digital currency: PBoC," *EJINSIGHT*, November 8, 2019, [www.ejinsight.com/eji/article/id/2298629/20191108-blockchain-not-suitable-for-china-s-digital-currency-pboc](http://www.ejinsight.com/eji/article/id/2298629/20191108-blockchain-not-suitable-for-china-s-digital-currency-pboc).
63. "央行数字货币研究所：分析区块链技术的优缺点与管理方法 [Central Bank Digital Currency Institute: Advantages and Disadvantages of Blockchain Technology and Management Methods]," *ChainNews*, February 21 2020, [www.chainnews.com/articles/190020074225.htm](http://www.chainnews.com/articles/190020074225.htm).
64. On Yao's departure, see Zhao, "PBoC's Digital Currency Chief Departs to Lead Securities Clearing House," *CoinDesk*. For the article, see 林洁琛, "姚前：区块链与央行数字货币 [Lin Jiechen, "Yao Qian: Blockchain and Central Bank Digital Currency]," *Yicai*, April 2, 2020, [www.yicai.com/news/100576775.html](http://www.yicai.com/news/100576775.html).
65. "Chinese regulator argues for blockchain use in central bank digital currency," *Ledger Insights*, April 6, 2020, [www.ledgerinsights.com/china-central-bank-digital-currency-regulator-csrc-blockchain/](http://www.ledgerinsights.com/china-central-bank-digital-currency-regulator-csrc-blockchain/).



66. For two sets of reporting on the possible structures for DCEP, see Jinze Jiang and Etienne Okeke, “First Look: China’s Central Bank Digital Currency,” Binance Research, August 28, 2019, [research.binance.com/en/analysis/china-cbdc](https://research.binance.com/en/analysis/china-cbdc); Shuyao Kong, “DCEP: An inside look at China’s digital currency,” Decrypt, June 28, 2020, [decrypt.co/33866/dcep-an-inside-look-at-chinas-digital-currency](https://decrypt.co/33866/dcep-an-inside-look-at-chinas-digital-currency).
67. Jiang and Okeke, “First Look: China’s Central Bank Digital Currency.”
68. “重磅！央行数字货币呼之欲出，设计理念和技术架构首次曝光（附穆长春演讲全文） [Big News! The Central Bank’s Digital Currency is About to Emerge, and the Design Concept and Technical Architecture are Exposed for the First Time (Including Full Text of Mu Changchun’s Speech)].”
69. 杨晓晨, 张明 [Xiaochen Yang, Ming Zhang], “【深度】央行数字货币的五个‘能’与‘不能’ [“In-depth, the Five ‘Can’s’ and ‘Cant’s’ of Central Bank Digital Currency],” Sina Finance, April 29, 2020, [finance.sina.com.cn/blockchain/roll/2020-04-29/doc-iirczymi8965102.shtml](https://finance.sina.com.cn/blockchain/roll/2020-04-29/doc-iirczymi8965102.shtml).
70. “Digital Yuan Patent Strategy: A Collection of Patent Applications Filed by the People’s Bank of China,” Chamber of Digital Commerce, February 2020, [digitalchamber.s3.amazonaws.com/PBoC-Patents-Translated-Data.pdf](https://digitalchamber.s3.amazonaws.com/PBoC-Patents-Translated-Data.pdf).
71. “【深度】央行数字货币的五个‘能’与‘不能’ [In-depth, the Five ‘Can’s’ and ‘Cant’s’ of Central Bank Digital Currency].”
72. Alyssa Hertig, “How Ethereum Works,” in “Ethereum 101,” CoinDesk, last updated December 3, 2020, <https://www.coindesk.com/learn/ethereum-101/how-ethereum-works>.
73. “【深度】央行数字货币的五个‘能’与‘不能’ [In-depth, the Five ‘Can’s’ and ‘Cant’s’ of Central Bank Digital Currency].”
74. On the screenshots, see Amy Castor and Shuyao Kong, “Has China’s digital currency gone into public beta?” Decrypt, April 14, 2020, <https://decrypt.co/25465/has-chinas-digital-currency-gone-into-public-beta>; on the QR codes and barcodes, see Issaku Harada, “China aims to launch digital yuan by 2022 Winter Olympics,” *Nikkei Asia*, May 27, 2020, <https://asia.nikkei.com/Spotlight/Cryptocurrencies/China-aims-to-launch-digital-yuan-by-2022-Winter-Olympics>.
75. “China’s Statutory Digital Currency Won’t Undermine Mobile Payments: Central Bank’s CBDC Chief,” China Banking News, June 15, 2020, <http://www.chinabankingnews.com/2020/06/15/chinas-statutory-digital-currency-wont-undermine-mobile-payments-central-banks-cbdc-chief/>.
76. “Head of China’s digital currency project: adoption is up to market,” Ledger Insights, June 16, 2020, <https://www.ledgerinsights.com/china-digital-currency-head-market-adoption/>.
77. Harada, “China aims to launch digital yuan by 2022 Winter Olympics.”
78. “中纪委：央行数字货币如何影响你我的日常生活？ [Central Commission for Discipline Inspection: How the Central Bank’s Digital Currency Affects Your Daily Life?],” Sina Finance, June 8, 2020, <https://finance.sina.com.cn/blockchain/roll/2020-06-08/doc-iirczymk5806799.shtml>.
79. “驻中国人民银行纪检监察组探索破解一把手监督难题 [The Disciplinary Inspection and Supervision Team stationed at the People’s Bank of China explores and solves the supervision problems of top leader],” CCDI, May 10, 2020, <https://archive.fo/HUhhT>; see also Ben Blanchard, “China’s central bank says graft busters must not be soft-hearted,” Reuters, September 25, 2015, <https://www.reuters.com/article/uk-china-corruption-pboc/chinas-central-bank-says-graft-busters-must-not-be-soft-hearted-idUKKCN0RQ01520150926>.
80. Zhou Xiaochuan, “周小川：信息技术与金融政策的相互作用 [Zhou Xiaochuan: Interaction of Information Technology and Financial Policy],” *China Finance*, July 31, 2019, <https://mp.weixin.qq.com/s/sNbUbT7Lv2T3PolBncxZsg>.
81. Li Qiaoyi, “China releases fintech development plan, aims for innovation while curbing risks,” *The Global Times*, August 22, 2019, <https://www.globaltimes.cn/content/1162371.shtml>.
82. “Chinese Central Bank Releases Fintech Development Plan for 2019-2021,” China Banking News, August 23, 2019, <https://www.chinabankingnews.com/2019/08/23/chinese-central-bank-releases-fintech-development-plan-for-2019-2021/>.
83. Jiang and Okeke, “First Look: China’s Central Bank Digital Currency.”
84. On the design sketches, see Yao, “Technical Aspects of CBDC in a Two-Tiered System.”; for a technical report examining this, see Jiang and Okeke, “First Look: China’s Central Bank Digital Currency.”
85. Raymond Zhong, “China’s Cryptocurrency Plan Has a Powerful Partner: Big Brother,” *The New York Times* (Chinese International Version), October 18, 2019, <https://cn.nytimes.com/china/20191018/china-cryptocurrency-facebook-libra/zh-hant/dual/>.
86. “重磅！央行数字货币呼之欲出，设计理念和技术架构首次曝光（附穆长春演讲全文） [Big News! The Central Bank’s Digital Currency is About to Emerge, and the Design Concept and Technical Architecture are Exposed for the First Time (Including Full Text of Mu Changchun’s Speech)].”
87. Harada, “China aims to launch digital yuan by 2022 Winter Olympics.”
88. For PBOC officials discussing DCEP’s privacy, see Yifei Fan, “范一飞：关于央行数字货币的几点考虑 [Several Considerations about the Central Bank’s Digital Currency],” Yicai, January 25, 2018, <https://www.yicai.com/news/5395409.html>; for other analysis of “controllable an-

- onymity,” see Martin Chorzempa, “China’s Central Bank-Backed Digital Currency Is the Anti-Bitcoin,” Peterson Institute for International Economics, January 31, 2018, <https://www.piie.com/blogs/china-economic-watch/chinas-central-bank-backed-digital-currency-anti-bitcoin>.
89. “央行数字货币的技术考量 [Technical Considerations for Central Bank Digital Currency],” Yicai, March 6, 2018, <https://www.yicai.com/news/5404436.html>.
  90. “Head of China’s digital currency project: adoption is up to market,” Ledger Insights, June 16, 2020, <https://www.ledgerinsights.com/china-digital-currency-head-market-adoption/>.
  91. “央行数字货币的技术考量 [Technical Considerations for Central Bank Digital Currency].”
  92. Yao, “A Systematic Framework to Understand Central Bank Digital Currency.”
  93. Fan, “范一飞：关于央行数字货币的几点考虑 [Fan Yifei: Several Considerations about the Central Bank’s Digital Currency].”
  94. Yao, “Technical Aspects of CBDC in a Two-Tiered System.”
  95. Zhong, “China’s Cryptocurrency Plan Has a Powerful Partner: Big Brother.”
  96. “视频 | 权威解读：央行数字货币如何助力治理腐败? [Video | Authoritative Interpretation: How Can PBoC’s CBDC Help Manage Corruption?],” Central Committee for Discipline Inspection, Communist Party of China, June 19, 2020, <http://v.ccdi.gov.cn/2020/06/18/VIDEclaxMdAbx-GdWlQhcxoIn200618.shtml>.
  97. “The 18th National Congress of the Communist Party of China,” Communist Party of China, November 2012, [http://www.china.org.cn/china/18th\\_cpc\\_congress/node\\_7167318.htm](http://www.china.org.cn/china/18th_cpc_congress/node_7167318.htm).
  98. Timothy R. Heath, “The Consolidation of Political Power in China Under Xi Jinping: Implications for the PLA and Domestic Security Forces,” Testimony before the U.S.-China Economic and Security Review Commission, February 7, 2019, [https://www.rand.org/content/dam/rand/pubs/testimonies/CT500/CT503/RAND\\_CT503.pdf](https://www.rand.org/content/dam/rand/pubs/testimonies/CT500/CT503/RAND_CT503.pdf).
  99. He Huifeng, “China’s social credit system shows its teeth, banning millions from taking flights, trains,” *South China Morning Post*, February 18, 2019, <https://www.scmp.com/economy/china-economy/article/2186606/chinas-social-credit-system-shows-its-teeth-banning-millions>.
  100. Michael del Castillo, “Blockchain Management Styles At 3 Systemically Important Financial Institutions Show A Diversity Of Strategies,” *Forbes*, October 1, 2020, <https://www.forbes.com/sites/michaeldelcastillo/2020/10/01/blockchain-management-styles-show-diversity-of-strategies-employed-at-systemically-important-financial-institutions/#25afb42f3f2d>.
  101. On the reports of threats to remove benefits by Chinese government officials, see Emily Feng, “Parents Keep Children Home As China Limits Mongolian Language In The Classroom,” NPR, September 16, 2020, [https://www.npr.org/2020/09/16/912623822/parents-keep-children-home-as-china-limits-mongolian-language-in-the-classroom?fbclid=IwAR2cb5BBsdwKqmPUBdOfw3i8oXiYevFEaM9Zxu07B-B98e9G0hmH3A\\_ZTDHA](https://www.npr.org/2020/09/16/912623822/parents-keep-children-home-as-china-limits-mongolian-language-in-the-classroom?fbclid=IwAR2cb5BBsdwKqmPUBdOfw3i8oXiYevFEaM9Zxu07B-B98e9G0hmH3A_ZTDHA); on the state restrictions, see “[公告] 锡林郭勒盟发展和改革委员会关于依法保障未成年人接受义务教育的公告 [Announcement on Legally Protecting Minors’ Compulsory Education],” Education Bureau and Development and Reform Commission of Xilingol League, Communist Party of China, September 16, 2020, <https://mp.weixin.qq.com/s/iKIf2bL5mbN-6vSO-6qeRbQ>.
  102. “[公告] 锡林郭勒盟发展和改革委员会关于依法保障未成年人接受义务教育的公告 [Announcement on Legally Protecting Minors’ Compulsory Education].”
  103. On promoting use of wallets by foreigners within China, see Yao Nian, “China’s digital currency takes shape amid COVID-19, benefits for foreigners,” China Global Television Network, May 27, 2020, [news.cgtn.com/news/2020-05-26/China-s-digital-currency-takes-shape-benefits-for-foreigners-QO3DpvsW1/index.html](https://news.cgtn.com/news/2020-05-26/China-s-digital-currency-takes-shape-benefits-for-foreigners-QO3DpvsW1/index.html); on promoting use by Chinese students abroad, see “Chinese Education Association BOSSA and Payments Specialist Flywire Announce Strategic Partnership,” *GlobeNewswire*, July 21, 2020, [www.globenewswire.com/news-release/2020/07/22/2065461/0/en/Chinese-Education-Association-BOSSA-and-Payments-Specialist-Flywire-Announce-Strategic-Partnership.html](https://www.globenewswire.com/news-release/2020/07/22/2065461/0/en/Chinese-Education-Association-BOSSA-and-Payments-Specialist-Flywire-Announce-Strategic-Partnership.html).
  104. Kelsey Clarke, “Samm Sacks on Why Chinese Tech Companies Perform Poorly Abroad,” *Asia Experts Forum*, October 9, 2019, [asiaexpertsforum.org/samm-sacks-on-why-chinese-tech-companies-perform-poorly-abroad/](https://asiaexpertsforum.org/samm-sacks-on-why-chinese-tech-companies-perform-poorly-abroad/).
  105. Karen Yeung, “China ‘stuck’ as rigid controls on capital outflows becoming harder to peel back,” *South China Morning Post*, August 26, 2020, [www.scmp.com/economy/china-economy/article/3098814/china-stuck-rigid-controls-capital-outflows-becoming-harder](https://www.scmp.com/economy/china-economy/article/3098814/china-stuck-rigid-controls-capital-outflows-becoming-harder).
  106. On China’s currency stability, see Kimberly Amadeo, “Dollar to Yuan Conversion and History: How a Tiny Change in the Yuan Can Panic Investors,” *The Balance*, July 28, 2020, [www.thebalance.com/dollar-to-yuan-conversion-and-history-3306089](https://www.thebalance.com/dollar-to-yuan-conversion-and-history-3306089); on the settlement system, see Wendy Wu, “Two Reasons Why China’s Currency Doesn’t Have More Global Clout,” *South China Morning Post*, September 13, 2017, [www.scmp.com/news/china/economy/article/2110946/two-reasons-why-chinas-currency-doesnt-have-more-global-clout](https://www.scmp.com/news/china/economy/article/2110946/two-reasons-why-chinas-currency-doesnt-have-more-global-clout).
  107. “已同中国签订共建“一带一路”合作文件的国家一览 [List

- of countries that have signed cooperation documents with China to jointly build the Belt and Road],” China One Belt One Road Network, April 12, 2019, <https://www.yidaiyilu.gov.cn/gbjg/gbgk/77073.htm>.
108. Colby Smith, “The Belt and Road’s Dollar Problem,” Alphaville blog, *The Financial Times*, December 18, 2018, [ftalphaville.ft.com/2018/12/18/1545130791000/The-Belt-and-Road-s-dollar-problem/](https://ftalphaville.ft.com/2018/12/18/1545130791000/The-Belt-and-Road-s-dollar-problem/).
  109. Clara Ferreira Marques, “Oil Price War May Revive China’s Yuan Ambitions,” Bloomberg, March 16, 2020, [www.bloomberg.com/opinion/articles/2020-03-16/oil-price-war-may-revive-china-s-global-yuan-ambitions](https://www.bloomberg.com/opinion/articles/2020-03-16/oil-price-war-may-revive-china-s-global-yuan-ambitions).
  110. Sina Finance, “龙白滔:央行数字货币将成为人民币国际化最大的法宝 [Long Baitao: The Central Bank’s Digital Currency will Become the Biggest Magic Weapon for the Internationalization of the RMB],” Sina Finance, August 12, 2019, [finance.sina.com.cn/blockchain/coin/2019-08-12/doc-ihytcitm8648461.shtml](https://finance.sina.com.cn/blockchain/coin/2019-08-12/doc-ihytcitm8648461.shtml).
  111. Lan Shen, “China—Belt and Road is taking shape,” Standard Chartered, November 8, 2017, [www.sc.com/en/trade-beyond-borders/five-ways-belt-and-road-is-taking-shape/](https://www.sc.com/en/trade-beyond-borders/five-ways-belt-and-road-is-taking-shape/).
  112. Lan and Shuang, “China—Belt and Road Is Taking Shape.”
  113. Sina Finance, “龙白滔:央行数字货币将成为人民币国际化最大的法宝 [Long Baitao: The Central Bank’s Digital Currency will Become the Biggest Magic Weapon for the Internationalization of the RMB].”
  114. Alexis Akwagyiram and Tom Wilson, “How bitcoin met the real world in Africa,” Reuters, September 8, 2020, [www.reuters.com/article/us-crypto-currencies-africa-insight/how-bitcoin-met-the-real-world-in-africa-idUSKB-N25Z0Q8?utm\\_medium=Social](https://www.reuters.com/article/us-crypto-currencies-africa-insight/how-bitcoin-met-the-real-world-in-africa-idUSKB-N25Z0Q8?utm_medium=Social).
  115. Alyssa Hertig, “Nigerians Are Using Bitcoin to Bypass Trade Hurdles With China,” CoinDesk, August 13, 2020, [www.coindesk.com/nigeria-using-bitcoin-trade-with-china](https://www.coindesk.com/nigeria-using-bitcoin-trade-with-china).
  116. On the stablecoin proposal, see “Guangdong-Hong Kong-Macao Greater Bay Area under spotlight at Two Sessions,” *People’s Daily*, March 5, 2019, [en.people.cn/n3/2019/0305/c90000-9552866.html](https://en.people.cn/n3/2019/0305/c90000-9552866.html); Sarah Tran, “Chinese Government to Consider Cross-Border East-Asian Stablecoin for Hong Kong Amid Implementing Controversial National Security Law,” Blockchain News, May 22, 2020, [blockchain.news/news/chinese-government-cross-border-stablecoin-hong-kong-national-people-congress-npc](https://blockchain.news/news/chinese-government-cross-border-stablecoin-hong-kong-national-people-congress-npc).
  117. “Guangdong-Hong Kong-Macao Greater Bay Area under spotlight at Two Sessions.”
  118. Helen Partz, “Singapore to Explore Central Bank Digital Currency With China,” Cointelegraph, June 19, 2020, <https://cointelegraph.com/news/singapore-to-explore-central-bank-digital-currency-with-china>.
  119. “Project Ubin: Central Bank Digital Money Using Distributed Ledger Technology,” Monetary Authority of Singapore, June 24, 2020, [www.mas.gov.sg/schemes-and-initiatives/project-ubin](https://www.mas.gov.sg/schemes-and-initiatives/project-ubin).
  120. On the China-Singapore economic relationship, see Amy Qin, “Worries Grow in Singapore Over China’s Calls to Help ‘Motherland,’” *The New York Times*, August 5, 2018, <https://www.nytimes.com/2018/08/05/world/asia/singapore-china.html>; Ravi Menon, “Shanghai and Singapore: Financial Centre Partnership” (panel remarks by the managing director, Monetary Authority of Singapore, at Lujiazui Forum 2020, June 18, 2020, via video conference from Singapore), Monetary Authority of Singapore, June 18, 2020, <https://www.mas.gov.sg/news/speeches/2020/shanghai-and-singapore-financial-centre-partnership>; and “新加坡金融局：今年启动沪新全面合作理事会金融工作小组 [Monetary Authority of Singapore: Launching the Shanghai-Singapore Comprehensive Cooperation Council Financial Working Group This year],” Shangguan News, June 18, 2020, [xw.qq.com/cmsid/20200618A0HL6200](https://www.xw.qq.com/cmsid/20200618A0HL6200).
  121. Jonathan Cheng, “China Rolls Out Pilot Test of Digital Currency,” *The Wall Street Journal*, April 20, 2020, [www.wsj.com/articles/china-rolls-out-pilot-test-of-digital-currency-11587385339](https://www.wsj.com/articles/china-rolls-out-pilot-test-of-digital-currency-11587385339).
  122. Eva Xiao, “China to Expand Testing of a Digital Currency,” *The Wall Street Journal*, August 14, 2020, [www.wsj.com/articles/china-to-expand-testing-of-a-digital-currency-11597385324](https://www.wsj.com/articles/china-to-expand-testing-of-a-digital-currency-11597385324).
  123. Cheng, “China Rolls Out Pilot Test of Digital Currency.”
  124. Yogita Khatri, “China’s digital currency has already been used in pilot transactions worth \$162 million,” The Block, October 6, 2020, [www.theblockcrypto.com/post/79907/china-digital-currency-pilot-transactions-162-million](https://www.theblockcrypto.com/post/79907/china-digital-currency-pilot-transactions-162-million).
  125. Will Heasman, “China readies digital Yuan for 2022 Beijing Winter Olympics,” Decrypt, April 21, 2020, [decrypt.co/26216/china-readies-digital-yuan-for-2022-beijing-winter-olympics](https://decrypt.co/26216/china-readies-digital-yuan-for-2022-beijing-winter-olympics).
  126. “央行：数字人民币封闭测试不会影响人民币发行流通 [Central Bank: Digital RMB Closed Testing will Not Affect RMB Issuance and Circulation],” Xinhua News Agency, April 17, 2020, [www.gov.cn/xinwen/2020-04/17/content\\_5503711.htm](https://www.gov.cn/xinwen/2020-04/17/content_5503711.htm).
  127. Michael del Castillo, “Alibaba, Tencent, Five Others To Receive First Chinese Government Cryptocurrency,” *Forbes*, August 27, 2019, [www.forbes.com/sites/michaeldelcastillo/2019/08/27/alibaba-tencent-five-others-to-recvie-first-chinese-government-cryptocurrency/](https://www.forbes.com/sites/michaeldelcastillo/2019/08/27/alibaba-tencent-five-others-to-recvie-first-chinese-government-cryptocurrency/).
  128. “China Construction Bank Temporarily Launches Digital Renminbi Wallet,” China Banking News, August 31, 2020, [www.chinabankingnews.com/2020/08/31/china-con](https://www.chinabankingnews.com/2020/08/31/china-con)

- [struction-bank-temporarily-launches-digital-renminbi-wallet/](#).
129. Yao, “Technical Aspects of CBDC in a Two-Tiered System.”
  130. On the payment platforms involved with DCEP, see Coco Feng and Masha Borak, “China’s digital currency will not compete with mobile payment apps WeChat and Alipay, says programme head,” *South China Morning Post*, October 26, 2020, <https://www.scmp.com/tech/policy/article/3107074/chinas-digital-currency-will-not-compete-mobile-payment-apps-wechat-and>; for the confirmation of involvement by Ant Financial executives, see Henny Sender, “China’s new digital currency takes aim at Alibaba and Tencent,” *Financial Times*, August 3, 2020, [www.ft.com/content/fec06de9-ac43-4ab8-81f3-577638bd3c16](http://www.ft.com/content/fec06de9-ac43-4ab8-81f3-577638bd3c16).
  131. “中国人民银行数字货币研究所与滴滴出行达成战略合作 [The People’s Bank of China Digital Currency Research Institute and Didi Chuxing Reached a Strategic Cooperation],” DiDi, press release, July 8, 2020, [www.didiglobal.com/news/newsDetail?id=935](http://www.didiglobal.com/news/newsDetail?id=935).
  132. Zheping Huang, Heng Xie, and Joanna Ossinger, “China Plans to Test Digital Yuan on Food Delivery Giant’s Platforms,” *Bloomberg*, July 15, 2020, [www.bloomberg.com/news/articles/2020-07-15/china-to-expand-digital-yuan-test-to-food-delivery-giant-meituan](http://www.bloomberg.com/news/articles/2020-07-15/china-to-expand-digital-yuan-test-to-food-delivery-giant-meituan).
  133. Daniel Palmer, “JD.com to Build Apps for China’s Digital Yuan Project: Report,” *CoinDesk*, September 30, 2020, [www.coindesk.com/jd-com-apps-china-digital-yuan-central-bank](http://www.coindesk.com/jd-com-apps-china-digital-yuan-central-bank).
  134. “央行：数字人民币封闭测试不会影响人民币发行流通 [Central Bank: Digital RMB Closed Testing will Not Affect Renminbi Issuance and Circulation],” *Xinhua News Agency*, April 17, 2020, [www.gov.cn/xinwen/2020-04/17/content\\_5503711.htm](http://www.gov.cn/xinwen/2020-04/17/content_5503711.htm).
  135. Jack Martin, “China’s President Xi Urges Accelerated Blockchain Technology Adoption,” *Cointelegraph*, October 25, 2019, [cointelegraph.com/news/breaking-chinas-xi-jinping-urges-accelerated-blockchain-technology-adoption](http://cointelegraph.com/news/breaking-chinas-xi-jinping-urges-accelerated-blockchain-technology-adoption).
  136. David Pan, “China’s Blockchain Infrastructure to Extend Global Reach With Six Public Chains,” *CoinDesk*, July 21, 2020, [www.coindesk.com/chinas-blockchain-infrastructure-to-extend-global-reach-with-six-public-chains](http://www.coindesk.com/chinas-blockchain-infrastructure-to-extend-global-reach-with-six-public-chains).
  137. Pan, “China’s Blockchain Infrastructure to Extend Global Reach With Six Public Chains.”
  138. BSN, “The BSN Public Chain Integration Plan—First Batch,” *Medium*, July 21, 2020, [medium.com/bsnbase/the-bsn-public-chain-integration-plan-first-batch-fb6027e5ca30](https://medium.com/bsnbase/the-bsn-public-chain-integration-plan-first-batch-fb6027e5ca30).
  139. Pan, “China’s Blockchain Infrastructure to Extend Global Reach With Six Public Chains.”
  140. Alice Su and Frank Shyong, “The Chinese and non-Chinese internet are two worlds. Here’s what it’s like to use both,” *Los Angeles Times*, June 3, 2019, [www.latimes.com/world/la-fg-us-china-internet-split-20190603-story.html](http://www.latimes.com/world/la-fg-us-china-internet-split-20190603-story.html).
  141. For details on international blockchain projects, see BSN, “The BSN Public Chain Integration Plan—First Batch,” and “China’s Blockchain Infrastructure to Extend Global Reach With Six Public Chains.”
  142. For more details on the range of blockchain projects China has pursued, see Yaya J. Fanusie and Trevor Logan, “Crypto Rogues: U.S. State Adversaries Seeking Blockchain Sanctions Resistance,” (Foundation for Defense of Democracies, July 2019), <https://www.fdd.org/wp-content/uploads/2019/07/fdd-report-crypto-rogues.pdf>; Jane Wu, “Blockchain as an Infrastructure: A Deep Dive Into China’s DLT Strategy,” *Cointelegraph*, June 23, 2020, [cointelegraph.com/news/blockchain-as-an-infrastructure-a-deep-dive-into-chinas-dlt-strategy](http://cointelegraph.com/news/blockchain-as-an-infrastructure-a-deep-dive-into-chinas-dlt-strategy).
  143. Saniya More, “Beijing government releases its blueprint for becoming a blockchain hub,” *The Block*, July 16, 2020, [www.theblockcrypto.com/linked/71992/beijing-blockchain-hub-2022](http://www.theblockcrypto.com/linked/71992/beijing-blockchain-hub-2022).
  144. U.S. Department of the Treasury, “National Strategy to Combat Terrorist and Other Illicit Financing 2020” February 6, 2020, <https://home.treasury.gov/system/files/136/National-Strategy-to-Counter-Illicit-Financev2.pdf>.
  145. “Central bank digital currencies: Foundational principles and core features,” *Bank for International Settlements*, October 9, 2020, [www.bis.org/publ/othp33.pdf](http://www.bis.org/publ/othp33.pdf).

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