

PROMISE AND PERIL OF DIGITAL MONEY IN CHINA

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Digital currency and fintech have been some of the most powerful forces for freedom and personal liberty in China for the past decade, but their future influence is uncertain. Starting as a disruptive force that gave Chinese unprecedented autonomy in their financial lives, connected either to global cryptocurrency networks or local tech ecosystems built by private firms, a new chapter is beginning. In this new era, one speech urging an emphasis on innovation instead of regulation can seemingly bring the full force of the Chinese state to bear onto a firm that once disrupted state banks with impunity. Technologies like blockchain first embraced by libertarians and cryptography enthusiasts as freeing money from dependence on the state look poised to become tools for governments to increase their ability to monitor and shape financial transactions. Meanwhile, disruptive fintech tools have become symbiotic with the major state banks, which will retain their role as the core of the financial system.

One of the most discussed but least understood elements of this potential shift in the liberating or controlling power of digital money is the plan from the People's Bank of China (PBOC) to launch a central bank digital currency (CBDC). Around 80 percent of central banks in a recent survey by the Bank for International Settlements (BIS) are now researching and exploring CBDCs, but

Cato Journal, Vol. 41, No. 2 (Spring/Summer 2021). Copyright © Cato Institute. All rights reserved. DOI:10.36009/CJ.41.2.8.

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few other central banks have committed to launching one (Auer, Cornelli, and Frost 2020). China's system, dubbed DC/EP (digital currency/electronic payments) is already in consumer trials and is likely to be the first CBDC rolled out in a major economy. The impact of DC/EP will be felt not only by 1.4 billion Chinese, but will also have global implications by setting a precedent for CBDC standards that could spread around the world.

The impact depends on a set of crucial design choices that do not yet appear settled, despite the advanced stage of thinking and implementation of DC/EP. This article will explore some of these design features and their implication for privacy, consider the prospects for new controls on the economy coming from DC/EP, and conclude with an evaluation of its potential international impact.

The Origins of China's CBDC Plans

Less than a decade ago, Chinese lived under heavy-handed financial repression. They had few choices to invest their hard-earned money outside apartments, a stock market dominated by state companies, and deposits at state banks. Capital controls made it difficult to get money out of the country to freer financial markets abroad. Deposits, the most common investment, had interest rates capped by the government, part of a system designed to funnel artificially cheap funds to state companies and government priorities.

Then, starting in 2013, digital currency in two key forms took off. Chinese rushed to buy and mine cryptocurrencies like bitcoin, and fintech tools like Alipay and WeChat pay, which rely on digitization of money bundled into ecosystems of e-commerce, games, and social media, became the most important touch point for the financial system for nearly a billion Chinese. Both have since been more strictly regulated, however, to reduce the potential threat they pose to the state.

Only months after bitcoin boomed in China, regulators stepped in with rules to ensure it would not compete with the RMB as a currency in circulation or unit of account, nor could Chinese financial institutions handle bitcoin. The regulations, issued in December 2013, relegated bitcoin to a niche role as a speculative asset, and academic studies suggest that these measures stopped its role in capital flight that could move wealth out of the purview of the state (Ju, Lu, and Tu 2016). Since then, regulations have tightened to the point

that digital currency exchanges have been forced out of the country as unwelcome gateways both to risky speculation and evasion of the state's controls.

At the same time, the PBOC took away an important lesson from the bitcoin boom and subsequent rise of digital currency and blockchain technology. Rather than being forced to quickly respond to financial innovations from abroad, the PBOC and other key Chinese policymakers aim to shape the way technology is applied to finance by being at the technological frontier. Success in fintech has also become a point of national pride and strategy. PBOC Vice Governor Fan Yifei, who oversees payments and digital currency, recently said that “fintech is the commanding heights of future global financial competition” (Fan 2019).

The PBOC first began research on launching its own digital currency in 2014, when it established a dedicated research team. Though six years have passed, and even retail trials have begun, many of the important elements of what DC/EP aims to achieve and how it will work remain to be either determined, announced, or both. The PBOC has not issued the equivalent of a “white paper” that comprehensively lays out the purpose and design choices involved in issuing the digital currency, and the ambitions and scope of the initiative may change. The PBOC's digital currency research institute has numerous patents and research papers spanning the blockchain/digital currency space, but the system may not work in practice as described in patent filings or publications. Nevertheless, the basics of the DC/EP system have been gradually fleshed out, mostly through interviews in Chinese media and speeches by PBOC officials, which serve as the main source material for the following analysis.

The ABCs of DC/EP

PBOC officials have said that DC/EP will be a direct liability of the central bank, part of base money (M0) like cash that is available to individuals and institutions alike. Like cash, it will pay no interest and maintain a stable value equivalent 1:1 to regular RMB. The PBOC describes it as a “two-tiered” system, which means that while the PBOC will centrally manage the new system, banks and other intermediaries will provide the consumer-facing elements. The two-tiered distinction is important because it means the PBOC will avoid the unprecedented and risky step of providing accounts at the

central bank directly to consumers, a move most central banks believe risks too much disintermediation of the banking system and exposure to operational risks to which central banks are unaccustomed. Recent speeches by Vice Governor Fan and Mu Changchun, head of digital currency research at the PBOC, have outlined an issuance model similar to cash, in which the central bank issues digital money to qualified banks, the only intermediaries that can buy or sell it. However, once purchased, like cash the digital currency can then be transacted either with banks or other digital wallets like Alipay and WeChat Pay (Mu 2020).

While blockchain technology allows for the creation of more decentralized payment systems, Mu and Fan have said that that decentralized systems “corrode the state’s monetary sovereignty,” and that blockchain systems cannot handle the required transaction throughput of at least 300,000 transactions per second for regular retail payments (Mu 2019). The PBOC has thus opted for a centralized architecture in which it controls the ledger of balances. It will not use blockchain, but payment providers will be welcome to build payment solutions using blockchain on top of DC/EP. How exactly the PBOC will control the ledger, which means having a payment system that connects different providers of digital wallets, and be “technology neutral” as it claims it will be, is unclear.

The initial stated ambition for DC/EP is to replace part of physical cash in circulation, but eventually the PBOC envisions it entirely replacing cash—a worrying prospect for many concerned about civil liberties. Complete replacement of cash, however, is likely far in the future. Zhou Xiaochuan, the reformist central bank governor who initiated the PBOC’s CBDC plans during his tenure, said in 2016 that, “digital currency will coexist with cash for quite a long time before it finally replaces cash” (Zhou 2016). Mu Changchun also recently stated that “as long as people have a need to use banknotes, the PBOC will not stop supplying them. I personally feel that in the foreseeable future, digital RMB and banknotes will coexist for a long time” (Mu 2020).

The impact of DC/EP will also depend on the extent to which it replaces other forms of currently digital money, like commercial bank money. Vice Governor Fan has asserted that it is not meant to replace these, which in any case tend to be already digital, but it is hard to imagine that a currency fully backed by the state will not take significant market share away from bank deposits and balances in

digital wallets like Alipay due to its direct state backing and status as fiat money (Chorzempa 2018a).

The Context for Privacy in China

Contrary to often oversimplified narratives on China, in the past few years, Chinese consumers have awakened to the importance of privacy and data protection, though they have little choice when it comes to government surveillance and data access. Too often, discussion on China considers new technologies without critical context: the extent to which the current system enables surveillance without the new technology, or the practical and political difficulties of installing and making use of an effective technology.

Cash transactions in China are already not fully anonymous, because ATM machines and other scanners record the serial numbers of banknotes that enter and leave the banking system. Of course, small individual transactions are anonymous (e.g., you can buy dumplings without sharing any information about yourself with the vendor or state). The extent of privacy from the government for payment transactions on systems run by banks or popular third-party wallets that dominate Chinese online payments today is largely unknown. There are no independent courts to establish guardrails on data that the government can obtain, but some widely publicized cases of firms refusing to share data with government agencies like the central bank suggest that visions of pipes shipping real-time microlevel data to government offices on payments are inaccurate.

At the moment, Chinese generally have little choice but to have each of their payment transactions watched by either Ant Group, which runs the Alipay super app alongside an empire of financial services that plugs into Alibaba's e-commerce and services ecosystem, or Tencent, whose WeChat super app plugs payments into a social media and gaming empire and a lot more. Together, they control around 90 percent of the online nonbank payments market. Some reports indicate that Tencent's data remain fragmented between the different areas of the app (Ding 2018). Nevertheless, then-PBOC research director Xu Zhong noted in a 2018 speech on big tech in finance that, "some tech companies used tech advantages to seize market share and mixed customer data from different services, raising the difficulty of protecting privacy" (Xu 2018). The PBOC is surely right that individuals' payments data are being used

for a host of other purposes. Every transaction with Alipay and WeChat pay generates a data trail freely available for the tech companies to use for credit scoring, advertising, cross-selling, and more.

Concerns about privacy from companies, however, have led to government action that in some cases goes beyond the United States. To name just one surprising example, Ant Group, which runs the Alipay super app used by over 700 million people, found itself in a public scandal with summons from multiple regulators because its system for enrolling people in Sesame Credit scores required users to opt out in a relatively hidden part of an agreement. Meanwhile, Americans have no ability to opt out of Equifax's credit data gathering and processing, despite its disastrous data breach that put their financial lives at risk, and generally in the United States, having to opt out seems far more common than making people opt in to services.

Most Western visions of China imagine that there is some giant tube feeding all data in China, including that at private-sector companies like Alibaba and Tencent, to government officials arrayed in a giant room of screens, but this oversimplifies a complex reality of give and take. My work has chronicled the government's difficulty in gaining access to financial sector data specifically from payment providers like Alipay and Tencent (Chorzempa 2018b). For example, a government system to pool credit data called Baihang has been unable to overcome tech giant opposition to sharing their valuable data, even though its largest shareholder is the PBOC. Data from Ant Group's online consumer lending activities, which started half a decade ago and has now reached 1.7 trillion RMB in outstanding loans, was only recently added into the central bank's credit bureau. It is unknowable for any outsider the extent of government access to tech companies' payment data, but it is not unfettered.

Privacy and CBDC

Privacy is one of the most contentious issues in digital currencies, mainly because the system design can enable either far more monitoring or more anonymous digital transactions compared to physical cash or existing digital payment methods. The privacy issues can be considered at two levels: what access do government authorities have to individual transaction data, and what access do parties to the transaction (e.g., merchants, banks, and payment processors/digital wallets) have. This analysis will focus on the former, which currently is

primarily related to anti-money laundering and counter-terrorism financing (AML/CFT) regulations.

The current AML system in many countries outsources much of the search for suspicious transactions involving banks and payment companies to those institutions, which are required to report transactions above a threshold or that constitute “suspicious activity.” Government data access is not some sort of “back door” built into their systems, nor does it control the ledger that would allow it to build surveillance into the currency itself. When it comes to cash, one of the benefits (or drawbacks, depending on one’s perspective) is its near anonymity. One does not need to provide identity documents to obtain or use cash. Paying in cash does not generate a data trail tied to one’s identity at the merchant, nor for any bank or payment processor. Of course, cash’s anonymity is not absolute. AML rules often mandate that a data trail be created for transactions above some size threshold, and cash can be tracked by serial numbers when it leaves and enters the financial system, as it is in China.

“Controllable Anonymity” Privacy from Firms, not Government

The PBOC is promoting DC/EP to the Chinese public as a more privacy-preserving way to pay than China’s currently dominant payment tools run by private firms, though government access to data will be unprecedented under the new system. In September 2020, Vice Governor Fan said that the current retail payment system based largely on Alipay and WeChat (though they are not named) “still has great room for improvement in . . . user privacy protection and anonymous payment” (Fan 2020). He says that DC/EP will provide what the market has not, because of firms’ incentives to sell or otherwise employ user data.

The PBOC’s slogan for privacy in DC/EP is “controllable anonymity,” which seems like a juxtaposition of two mutually exclusive concepts. In fact, it offers consumers something of a choice between relative privacy from private-sector tech companies (by using DC/EP) or government (with Alipay/WeChat), though of course no option in China provides full privacy from authorities. Vice Governor Fan has described controlled anonymity as limiting access to the vast majority of data to the PBOC, which, however, will “grasp the entirety of information so it can employ big data, AI, and other

technology to analyze transaction data and money flows, prevent and eliminate money laundering, financing of terrorism, tax evasion, and other illegal criminal behaviors” (Fan 2020) This striking statement suggests that the PBOC will have a “god’s eye” view of a ledger that shows every balance and transaction in real time. CBDCs bundle money and a payment system, a fact explicitly recognized by China’s decision to include currency and payments together in the system’s name. How to maintain privacy under a CBDC is a difficult issue in any jurisdiction, because it is hard to imagine including features of a payment system without a strong AML/CFT regime.

A choice to make the system a “no privacy” scenario, in which the PBOC has stores and unlimited ability to access the real name of every individual or entity associated with the wallet addresses transacting with DC/EP, would encounter fierce political resistance from other parts of the bureaucracy because of what that would mean for the PBOC’s relative power. Such data could be the ultimate weapon for political battles of different patronage networks, too powerful to put in any individual’s hands, especially because of what it would reveal about powerful officials involved in corruption. Too often, “the government” or “the Party” in China is assumed to be a unitary entity, while in fact it is composed of bureaucracies and individuals within them that have diverging interests and often acrimonious disagreements. Therefore, what results is likely to have at least some privacy controls built in, if only to protect the data of important people from rivals within government.

Imagine a system like bitcoin’s design in which every transaction is tracked but only associated with a wallet address. Unlike bitcoin, only the PBOC could view the whole ledger. With the caveat that China lacks independent courts and other mechanisms that could restrain government data access, it could set procedural requirements with oversight outside the PBOC for it to request the wallet provider or bank involved to “unmask” and identify the entity associated with the address in the event of a criminal investigation. Though Yao Qian, when acting as director of the PBOC’s Digital Currency Research Institute in 2018, outlined a plan for controllable anonymity in which the PBOC would have full access to individual identity data, that does not necessarily mean the PBOC will want, or be able, to go this route (Yao 2018).

Another possible scenario is also best understood within the context of bitcoin. One can buy and sell bitcoin on Coinbase with only an

update to Coinbase's private ledger, but transfers of bitcoin in and out of Coinbase require submission to the blockchain. DC/EP could permit a similar structure, in which the PBOC would have a record of a wallet/payment provider's purchase, sale, or transfer of DC/EP to and from other wallet/payment systems. That would ensure control over the money supply and authority over the new digital equivalent of the interbank payment system. Transactions between individuals using the same wallet, however, could occur without any record being sent directly to the PBOC. Such a design would preserve many elements of the division of labor in the current financial system. It would also fulfill the "two-tier" concept the PBOC has insisted on from the beginning of the DC/EP project that maintains intermediaries between regular consumer transactions and the central bank, in addition to preserving more privacy from the government than if every transaction needed to be reported. This scenario, however, is less likely than the first because it would result in the PBOC losing the advantage in control and surveillance that DC/EP would otherwise offer it.

Officials have also discussed options to maintain a deeper level of anonymity, similar to cash today, by allowing individuals to transact and hold amounts below a threshold determined by the PBOC in DC/EP wallets without providing identification or linking to a bank account, which it calls a system "loosely coupled" to bank accounts. Officials familiar with the current plans confirmed that this kind of system will involve registering wallets only with phone numbers that can only be linked to them with a special data request from the PBOC to the telecom companies. This idea, part of an initiative to expand financial inclusion to an unbanked population about as large as the entire population of the United States, also includes support for offline transactions so that people in rural areas without reliable internet access can still transact peer-to-peer digitally. This feature, however, is not yet part of the public pilot program, as it is technically more complex than online transactions that the PBOC can verify.

Despite claims of a focus on anonymity, all signs point to DC/EP enabling much greater surveillance of financial transactions than the current system. Sensible design choices could create a useful compromise, but the desire to surveil could well overcome political constraints and inter-department turf battles, meaning DC/EP would end all privacy from the government for financial transactions that use the system.

Control

One of the primary motivations for many central banks exploring CBDCs is an increase in the controls they have over the economy, including the ability to impose negative interest rates without risking a flight to paper cash. In China, the PBOC has not yet endorsed use of smart contracts or adding new functionality into money that would raise serious civil liberties concerns, though they do not rule out adding this later.

In 2018, Vice Governor Fan spoke about the potential for digital currency to enable regulators to program in, for example, automatic tax payments on transactions or block payments that might fund terrorism. However, he also said that there would need to be solid legal footing to do so, which would most likely necessitate amending the definition of the currency in the central bank law (Fan 2018). There is good reason to think that smart contracts are not coming to DC/EP anytime soon. A revision to the central bank law proposed in October 2020, which includes formal recognition of the RMB's digital form, does not include any smart contract-related alterations, and the law is not amended often—the last time was in 2015 (People's Bank of China 2020).

Conclusion

Despite being one of the most advanced economies in development of a CBDC, China's plans as presented to the public still leave many of the most important questions and tradeoffs about privacy and control unanswered. DC/EP will likely continue the general pattern of privacy protections in China, which increasingly constrain private actors' data gathering and use activities but at the same time increase the government's technical capability to surveil the populace and control more economic transactions. Chinese have already largely given up privacy by giving up cash to adopt digital payment systems, and they may end up in the next stage transacting CBDC in Alipay or WeChat Pay wallets, giving their data to both the government and private-sector wallet providers. That would be the worst-case scenario for civil liberties.

However, the more the surveillance and control is built in, the more the digital RMB's chances to attain international influence will be constrained. Few governments like dollarization, but at least their citizens can transact without the Federal Reserve seeing every one of

their retail transactions. None would want their citizens using an off-shore digital RMB if it would mean opening their domestic transactions to Chinese government surveillance or future controls.

Though other central banks' approaches to privacy are also not fully fleshed out, some based in democratic countries are already working on what appears to be an alternative vision for CBDC more in line with their values, as evidenced by the recent BIS report on central bank digital currencies that pointedly did not include China (BIS 2020), which suggests that China's pioneering role in CBDC development will not automatically result in other countries following the PBOC's standards or taking the same side of important trade-offs. Other countries, will, however, be able to learn from China's successes and missteps with DC/EP, making China a preview of a potential future that appears in time to ensure that objectionable versions of it do not make their way to other countries.

References

- Auer, R.; Cornelli, G.; and Frost, J. (2020) "Rise of the Central Bank Digital Currencies: Drivers, Approaches and Technologies." BIS Working Papers No. 880 (August).
- Bank for International Settlements (2020) *Central Bank Digital Currencies: Foundational Principles and Core Features*. Report No. 1. Basel, Switzerland: BIS. Available at www.bis.org/publ/othp33.pdf.
- Chorzempa, M. (2018a) "China's Central Bank-Backed Digital Currency Is the Anti-Bitcoin." Peterson Institute For International Economics *China Economic Watch* (January 31).
- _____ (2018b) "China Needs Better Credit Data to Help Consumers." Available at www.piie.com/publications/policy-briefs/china-needs-better-credit-data-help-consumers.
- Ding, J. (2018) "Tencent: A Complete Takedown and Rethinking of China's So-Called AI Giant." *ChinAI Newsletter* No. 25 (August 26).
- Fan, Y. F. (2018) "Yicai Interview: Some Thoughts on Central Bank Digital Currencies." Available at www.yicai.com/news/5395409.html.
- _____ (2019) Speech at the Sina Financial Qilu Forum, November 28. Reported in "Fintech Will Be the Commanding

- Heights of Global Financial Competition in Future: PBOC Vice Governor Fan Yifei.” *China Banking News* (November 29).
- _____ (2020) “范一飞：关于数字人民币M0定位的政策含义分析.” *Yicai Media* (September 14). Available at www.yicai.com/news/100770937.html.
- Ju, L.; Lu, T.; and Tu, Z. Y. (2016) “Capital Flight and Bitcoin Regulation.” *International Review of Finance* 16 (3): 445–55.
- Mu, C. C. (2018) “Speech at the Third Yichun Forum.” *China Finance 40 Forum* (August 10). Available at https://k.sina.com.cn/article_6465571420_18160ca5c01900i0li.html.
- _____ (2020) “穆长春谈数字人民币钱包：已发现假冒的深圳没在二手房试.” *Bund Financial Summit* (October 26). Available at <https://web.archive.org/web/20201103122329/https://www.cnbeta.com/articles/tech/1045037.htm>.
- People’s Bank of China (2020) “中国人民银行关于《中华人民共和国中国人民银行法（修订草案征求意见稿）》公开征求意见的通知.” People’s Bank of China (October 23). Available at www.pbc.gov.cn/goutongjiaoliu/113456/113469/4115077/index.html.
- Xu, Z. (2018) “大技术公司如何影响金融发展?.” *Yicai Media* (November 18). Available at <https://www.yicai.com/news/100061767.html>.
- Yao, Q. (2018) “Technical Aspects of CBDC in a Two-Tiered System.” Available at www.itu.int/en/ITU-T/Workshops-and-Seminars/20180718/Documents/Yao%20Qian.pdf.
- Zhou, X. C. (2016) “Transcript of Governor Zhou Xiaochuan’s Exclusive Interview with *Caixin Weekly*.” People’s Bank of China (February 14). Available at www.pbc.gov.cn/english/130721/3017134/index.html.