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Background and Implications of China's E-CNY

Jiaying Jiang¹ and Karman Lucero²

Abstract

The People's Republic of China is a leading experimenter in central bank digital currencies (CBDCs). This report explores the current background, deployment, features, potential impacts, challenges and legal concerns of China's CBDC, the electronic yuan, or E-CNY. This report explains the potential significance of what is known and not known about E-CNY with a particular focus on how E-CNY might fit into existing legal and economic systems, both within China and internationally. On the surface, E-CNY looks transformative. When you dig a little deeper, however, most of the potential changes or transformations turn on broader institutional, political, and legal changes that, so far, have not accompanied the deployment of E-CNY. Without those broader changes, the impact of E-CNY will likely remain limited and E-CNY may not be able to achieve its policy goals.

Introduction

China's central bank digital currency (CBDC), the electronic yuan or E-CNY, is the digital version of fiat currency issued by the China's Central Bank, the People's Bank of China (PBOC) and operated by authorized financial institutions and tech companies. China is one of the first major economies to issue a CBDC that could have global implications. Many forms of CBDC are possible, such as a wholesale CBDC or a retail CBDC. A wholesale CBDC is used between financial institutions to settle trades in financial markets; a retail CBDC is used by individuals to pay businesses, shops or each other (like cash).³ Various design choices are available for the development of a CBDC—examples include direct, two-tier, or hybrid models, with token or account access models.⁴ This list of categories is not exhaustive; a great deal of complexity underlies the choices in access, intermediation, institutional roles, and data retention in CBDC design that have different implications for the technical, institutional, and/or social infrastructure of how a CBDC is designed, implemented, and used.⁵ Design choices are complex, multilayered, and multifaceted.⁶

This report introduces the development, initial deployments and implications of China's E-CNY. It analyzes China's motivations for issuing a CBDC and explores the potential impacts and challenges of E-CNY. Currently, it appears that China's pioneering the creation of E-CNY is driven mainly by the hopes of advancing domestic policy goals, such as reducing costs, combatting money laundering, improving financial inclusion, transforming to a cashless economy, responding to the duopoly of the mobile payment market, and generally increasing government insight into and

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³ *BIS Innovation Hub Work on Central Bank Digital Currency (CBDC)*, BIS, <https://www.bis.org/about/bisih/topics/cbdc.htm>.

⁴ *Project Hamilton Phase 1 Executive Summary*, FEDERAL RESERVE BANK OF BOSTON, <https://www.bostonfed.org/publications/one-time-pubs/project-hamilton-phase-1-executive-summary.aspx>

⁵ *Id.*

⁶ *Id.*

capacity to intervene in the Chinese economy. Externally, China's experimentation with E-CNY has been sped up by Diem due to the threat that Diem could potentially undermine the monetary sovereignty of the RMB. It is also arguable that China has an agenda to use E-CNY to circumvent U.S. and international sanctions,⁷ and even to internationalize the RMB, though whether it could actually succeed in doing so is debatable.

E-CNY may also impact China's domestic financial system as well as the global financial system. First, E-CNY may reduce transaction costs and increase efficiency by shifting to a free digital currency for individuals and businesses. Second, E-CNY may impact the payment and mobile payment duopoly held by Alibaba and Tencent. Third, E-CNY could impact monetary and economic policy by, in theory, offering greater control over the currency. Fourth, E-CNY may also impact the relationship between Belt and Road Initiative (BRI)⁸ countries and China since countries that have increasingly interconnected relationships with China, but do not have a strong and established domestic financial infrastructure, may be drawn to mobile payment systems. Last, one possible goal of E-CNY may be to impact international settlements by creating circumstances where international governments (including China), businesses, and other actors are more able to use a Chinese-backed SWIFT alternative.

Besides E-CNY's impact on financial systems, E-CNY raises many concerns. For one, there is the uncertainty which state and non-state actors have access to information generated by and related to the deployment and use of E-CNY. Similarly, there are questions concerning how state agencies will guarantee due process rights regarding access to and use of data. Another challenge is how states and intermediaries will protect users' privacy. Last, the lack of technological transparency and cybersecurity threats present further challenges.

This report proceeds as follows. Section I discusses the development of E-CNY, including known technical features, institutional framework, and E-CNY's intended role in China's domestic monetary system. Section II explores China's motivations for developing and deploying E-CNY, most of which are focused on domestic concerns, though there are important international dynamics as well. Section III outlines a number of potential impacts of E-CNY, including domestic impacts on online payment platforms such as Alipay and WeChat Pay and commercial banks as well as impacts on international settlements and BRI countries. Section IV addresses key challenges and concerns around E-CNY, particularly as it pertains to information access and sharing, privacy protections, due process rights, cybersecurity threats, and intermediaries. The last section examines E-CNY in the context of additional legal paradigms, including taxation, antitrust, anti-money laundering, and fraud prevention.

I. The definition, development, and key features of E-CNY

The exact technical and institutional parameters of E-CNY are not public; any "definition" of E-CNY therefore must be based on statements by government officials about E-CNY and observations about how E-CNY is used in practice. Some sources have described E-CNY as "based

⁷ Aditi Kumar & Eric Rosenbach, *Could China's Digital Currency Unseat the Dollar?*, FOREIGN AFFS. (May 20, 2020), <https://www.foreignaffairs.com/articles/china/2020-05-20/could-chinas-digital-currency-unseat-dollar>.

⁸ Andrew Chatzky & James McBride, *China's Massive Belt and Road Initiative*, COUNCIL ON FOREIGN AFFS. (Jan. 28, 2020), <https://www.cfr.org/backgrounder/chinas-massive-belt-and-road-initiative>

on broad accounts, loosely coupled with bank accounts and has its system of value.”⁹ However, E-CNY is fundamentally different from existing mobile payment systems and cryptocurrencies. That

⁹ *Progress of Research & Development of E-CNY in China*, PBOC, 6 (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

said, China has been one of the main pioneers in exploring the implications that a CBDC may bring. China has conducted pilots in at least ten regions, as well as during the 2022 Beijing Winter Olympics over the past eight years. From these studies, others have examined some key features of E-CNY, including its operating structure, institutional background, issuance and redemption process, technical designs, and financial characteristics.

A. Definition

The PBOC defines E-CNY as the digital version of fiat.¹⁰ E-CNY has all the basic functions of money, i.e., it is a unit of account, medium of exchange, and store of value.¹¹ As with the physical form of RMB, E-CNY is China's legal tender.¹² The PBOC also defines E-CNY is mainly a substitute for cash in circulation (M0) that will coexist with physical RMB.¹³

E-CNY is different from existing mobile payment systems such as Alipay and WeChat Pay. First, E-CNY is legal tender, but Alipay and WeChat Pay are payment tools- they are intermediaries that still have to operate through commercial banks and they do not issue their own currency. Although Alipay and WeChat Pay have been widely used in China, one can still legally refuse to accept payment made via WeChat Pay or Alipay but cannot legally refuse to accept E-CNY because E-CNY, just like cash, is a legal tender backed by the state. Second, technological and operational differences exist between them. For instance, E-CNY allows for offline transactions while Alipay and WeChat Pay heavily rely on an Internet connection to process transactions. E-CNY does not need to be associated with a bank account to make payments while Alipay and WeChat Pay do. These differences are further addressed in the section about E-CNY features.

E-CNY is also fundamentally different from cryptocurrencies such as Bitcoin and Ethereum. E-CNY is a fiat currency issued and governed by the central bank. The technical details of how it works are not public, but PBOC officials have stated that it does not run on a blockchain.⁸ By contrast, cryptocurrencies are a type of privately issued money running either on a blockchain, which is produced by solving complex mathematical proofs and governed by disparate online communities instead of a centralized body, or some other kind of privately run, generally centralized, clearing system. E-CNY is a legal tender, but cryptocurrencies are not; their worth is not backed by a state directly and one can reject cryptocurrencies as a form of payment. The value of E-CNY, like existing fiat currency, is influenced by policymakers and the vicissitudes of micro and macroeconomics but ultimately guaranteed, and to an extent controlled, by the state, whereas the value of cryptocurrencies is determined by the market, the

¹⁰*Progress of Research & Development of E-CNY in China*, PBOC, 3 (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.* at 4.

expectations of the network, and adverse policy making,¹⁴ and thus is highly volatile.

B. The Timeline of E-CNY Development

China is a pioneer in exploring CBDC. The early-stage research started in 2014 when a group of experts started to examine the feasibility of establishing a CBDC.¹⁵ In 2016, the PBOC held a seminar on CBDC in Beijing and recognized the positive practical significance and far-reaching historical impacts of CBDC.¹⁶

A series of discussions then focused on the design of E-CNY. In an interview with Caixin, Zhou Xiaochuan, then governor of the PBOC, stated that digital currency could be account based or non-account based.¹⁷ Fan Yifei, deputy governor of the PBOC, suggested that E-CNY should be within the scope of money in circulation and he discussed two possible operating frameworks of E-CNY —a one-tier (in which users have accounts directly with the PBOC) and two-tier (in which commercial banks and other entities serve as the main intermediaries) distribution model.¹⁸ Yao Qian, then Vice Director-General of the Technology Department of the PBOC, proposed the concepts of an account-based and wallet-based E-CNY, and he further put forward a two-tier model of E-CNY distribution.¹⁹

In January 2017, the PBOC formally established the Digital Currency Research Institute with Yao Qian as its first director.²⁰ In the same year, with the approval of the State Council, the PBOC formally began working on E-CNY. In January 2018, Fan Yifei confirmed the benefits of the two-tier distribution model and emphasized that E-CNY should be released in a loosely coupled manner and adhere to centralized (not distributed) governance.²¹

¹⁴ Alun John, Samuel Shen, & Tom Wilson, *China's Top Regulators Ban Crypto Trading and Mining, Sending Bitcoin Tumbling*, REUTERS (Sept. 24, 2021, 1:49 PM), <https://www.reuters.com/world/china/china-central-bank-vows-crackdown-cryptocurrency-trading-2021-09-24/>.

¹⁵ *Progress of Research & Development of E-CNY in China*, PBOC, 3 (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>

¹⁶ *Progress of Research & Development of E-CNY in China*, PBOC, 3 (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

¹⁷ Zhuan Fanf Zhou Xiaochuan(专访周小川) [exclusive interview with Zhou Xiaochuan], https://weekly.caixin.com/m/2016-02-12/100908570_all.html; see also <https://www.safe.gov.cn/guangdong/2016/0218/362.html>

¹⁸ Fan Yifei(范一飞): Guanyu Shuzi Renminbi M0 Dingwei de zhengce Hanyi Fendi(关于数字人民币 M0 定位的政策含义分析) [the policy implications of positioning E-CNY as an M0] <https://www.yicai.com/news/100770937.html>; see also Robert, Greene, *What Will Be the Impact of China's State-Sponsored Digital Currency?*, CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE (July 1, 2021),

¹⁹ Bianews, Yaoqian Fenxiang Yanghang Fading Shuzi Huobi "Shuangceng Jiagou": Jiyu Zhanghu yu Qianbao Fencent Bingyong(姚前分享央行法定数字货币“双层架构”：基于账户与钱包分层并用) [Yaoqian Shared the “two-tiered structure” of the Central Bank Digital Currency] <https://www.mpaypass.com.cn/news/201808/06103010.html>

²⁰ *Progress of Research & Development of E-CNY in China*, PBOC, (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

²¹ Yanghang Shuzi Huobi Yanjiusuo: Zhashi Kaizhan Shuzi Renminbi Yanfa Shidian Gongzuo, (央行数字货币研究所：扎实开展数字人民币研发试点工作) [The Central Bank Digital Currency Research Institute: Solidly Carry

In May 2019, Mu Changchun, then deputy director of the Payment and Settlement Department of the PBOC, further elaborated the two-tier distribution model of E-CNY—to ensure that the central bank does not overissue E-CNY, commercial banks should pay 100% of the reserve to the central bank.²² E-CNY is still a central bank liability guaranteed by the central bank’s credit, and, like other central banks, it has unlimited legal indemnity. Mu Changchun also emphasized that E-CNY has intentionally remained technologically neutral, meaning the PBOC does not have a fixed technological architecture for the E-CNY.²³ A fixed architecture would likely only limit potential business cases in the future.²⁴ The PBOC did not adopt blockchain, but did borrowed associated concepts such as peer-to-peer payment and traceability.²⁵ The PBOC is maintaining a flexible position so that it can adapt to different architectures and remain compatible with technologies adopted by commercial banks. Of course, it is impossible to critically assess this claim as the E-CNY’s underlying architecture, however flexible or malleable, is not public.

Later in November 2019, Fan Yifei confirmed that the major work of E-CNY, such as the high-level design, standard formulation, and functional research and testing, had been completed.²⁶ The next step would be to select pilot areas to test and optimize E-CNY, following the principles of stability, safety, and controllability.²⁷ In April 2020, China launched trials of E-CNY in four cities: Shenzhen, Suzhou, Chengdu, and Xiong’an.²⁸ In May, the PBOC was in talks with private companies to expand its test run. Major firms such as China’s largest ride-hailing company Didi Chuxing, China’s Uber or Lyft, and food delivery giant Meituan Dianping were among the candidates to roll out E-CNY on a large scale through their wide-reaching platforms.²⁹ As a part of the trials, in October 2020, the PBOC distributed 10 million

out the Pilot Work of Digital Renminbi Research and Development]

https://finance.sina.com.cn/money/bank/bank_hydt/2022-10-12/doc-imqqsmrp2326411.shtml

²² Qukuailian Xingqiu (区块链星球), Yanghang Shuzi Huobi Sheji Jianchi Zhongxinhua Guanli Moshi (央行数字货币设计坚持中心化管理模式) [the Design of the Central Bank Digital Currency Adheres to the Centralized Management Model] <https://www.qklplanet.io/2019/08/16/135128/>

²³ *Progress of Research & Development of E-CNY in China*, PBOC (2021),

<http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

²⁴ *Progress of Research & Development of E-CNY in China*, PBOC (2021),

<http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

²⁵ *Progress of Research & Development of E-CNY in China*, PBOC, (2021),

<http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

²⁶ <http://shenzhen.pbc.gov.cn/shenzhen/122787/4013185/index.html>

²⁷ <http://shenzhen.pbc.gov.cn/shenzhen/122787/4013185/index.html>

²⁸ Southern Metropolis Daily, Shuzi Renmibi Laile! Shenzhen, Chengdu, Suzhou, Xiong’an Xinqu Dengdi Shuaixian Zhankai Shidian(数字人民币来了! 深圳、成都、苏州、雄安新区等地率先展开试点) [Digital Yuan is Coming! Pilot Programs will be initiated in Shenzhen, Chengdu, Suzhou, and Xiong’an etc.]

<https://m.mp.oeeee.com/a/BAAFRD000020200814354576.html>

²⁹ Didi yu Yanghang Shuzi Huobi Yanjiusuo Dacheng Zhanlue Hezuo Tansuo Zhihui Chuxing Changjing Yingyong (滴滴与央行数字货币研究所达成战略合作探索智慧出行场景应用) [Didi and Digital Currency Research Institute have reached strategic cooperation exploring use cases in transportation] <https://www.reuters.com/article/didi-pboc-0708-wedn-idCNKBS2491BT> see also Sidahang Neice Daguimo Jingxing, Yanghang Shuzi Huobi Jiang Heshi Luodi? (四大行内测大规模进行, 央行数字货币将何时落地?) [Four banks are testing the central bank digital currency; when will the central bank digital currency be implemented?] <https://www.8btc.com/article/632339>

E-CNY (US\$ 1.4 million) in digital “red pockets” to 50,000 Shenzhen residents.³⁰ Residents could spend it at over 3,300 restaurants and retail stores. The week-long trial ended with 8.8 million E-CNY (US\$ 1.3 million) being spent in over 62,000 transactions.

Starting from November 2020, Shanghai, Hainan, Changsha, Xi’an, Qingdao, Dalian joined the pilot.³¹ According to data published by the PBOC, “as of June 30, 2021, E-CNY has been applied in over 1.32 million use cases, covering utility payments, catering services, transportation, shopping, and government services.³² More than 20.87 million personal wallets and over 3.51 million corporate wallets had been opened, with transaction a volume totaling 70.75 million and transaction value approximating RMB 34.5 billion.”³³ During the 2022 Winter Olympics, China tested the appeal of E-CNY by providing E-CNY’s mobile application and payment cards or wristbands to visiting foreigners.³⁴ The Olympic Games provided an international center stage to test the capabilities of the E-CNY.³⁵ In fact, top officials from the PBOC reported that E-CNY was being used to make 2 million yuan (\$315,761) or more payments a day.³⁶

These pilot programs tested the business and technological designs as well as whether the E-CNY system is stable, the product is user-friendly and the scenario is applicable.³⁷ China has continued these pilot programs at a large scale with more corporate and individual participants, as well as more use cases, throughout 2022. It is still unclear when China will officially launch the E-CNY nationally and internationally and not just as pilot programs, if ever.

A. Key Features of E-CNY

This section addresses some key features of E-CNY, including its operating structure, institutional background, issuance and redemption process, technical designs, and financial characteristics. At this moment, the only available source from the PBOC is the report published in July 2021. Without more details and specific access to technical details, there are many unanswered questions regarding how E-CNY works at a technical and institutional level. As of the beginning of 2023, E-CNY remains “little used” according to former PBOC

³⁰ Shuzi Renminbi Zhende Laile! Shenzhen Lianshou Yanghang Paifa 1000 Wan “Shuzi Hongbao” (数字人民币真的来了! 深圳联手央行派发 1000 万“数字红包”)) [Digital Yuan is coming! Shenzhen is working with the central bank to issue “digital red pockets” worth 10million RMB] <https://finance.sina.com.cn/blockchain/coin/2020-10-09/doc-iivhvpwz0960147.shtml>

³¹ *Progress of Research & Development of E-CNY in China*, PBOC (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

³² *Progress of Research & Development of E-CNY in China*, PBOC (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

³³ *Id.*

³⁴ Marc Jones, *Over \$315,000 in Digital Yuan Used Every Day at Olympics, PBOC Official Says*, REUTERS (Feb. 16, 2022, 3:16 AM), <https://www.reuters.com/technology/around-300-mln-digital-yuan-used-every-day-olympics-pboc-official-says-2022-02-15/>.

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.*; *PBC Holds Meeting on Pilot Program of E-CNY R&D*, PBOC (2022), <http://www.pbc.gov.cn/en/3688110/3688172/4437084/4529973/index.html>; *Chinese Embrace Digital Yuan as China Further Promotes Pilot Program-Xinhua*, ENGLISH NEWS (May 14, 2022, 7:52 PM), <https://english.news.cn/20220514/18c29e06fb264f00a6d85672104d2c31/c.html>.

official Xie Ping.³⁸

1. E-CNY and the Existing Monetary System

E-CNY is designed to replace cash, or “M0,” which refers to physical currency in circulation and is the most liquid form of money. M1 includes M0 plus money held in checking accounts in banks (including in digital form). M2 includes M1 plus money held in savings accounts and certificates of deposits (CDs). Similar to traditional cash, E-CNY holders will not receive any interest from the central bank for having E-CNY; E-CNY will only earn interest if it is stored in an interest-bearing account in a bank. At this stage, E-CNY is not designed for M1 or M2 replacement because the PBOC believes that significant parts of M1 and M2 have already been digitized. In other words, commercial banks, online payment platforms, and other entities that store money in bank accounts already do so in digital form. Besides, the digitalization of all parts of M1 and M2 is complex and likely outside of the current capability of the E-CNY design.

Some government actors may have broader ambitions than just positioning E-CNY as a replacement for M0 only. Mu Changchu, for example, describes the value of E-CNY in creating and utilizing smart contracts.³⁹ The PBOC has fully recognized this concern and has thus used the term “at this stage” cautiously.⁴⁰ In the future, once the PBOC gains more experience with E-CNY, the scope and goals of its use could change. As Yao Qian suggests, positioning E-CNY as an M0 replacement at this stage not only measures risks but is also forward looking.⁴¹ At this stage, to ensure that E-CNY will not be overissued, commercial banks are required to maintain a 100% reserve ratio.⁴² As a result, E-CNY should not have any derivative deposits or money multipliers. Currently, E-CNY does not offer anything novel from a user perspective, though it might be changing the relationship between the PBOC and other entities in the financial infrastructure, such as commercial banks and online payment platforms.

2. Two-Tier System for Issuance and Redemptions

The distribution of E-CNY will follow the traditional currency distribution model—a two-tier system with two distinct layers of functionality. On the first layer, the PBOC will issue and redeem E-CNY to commercial banks and other authorized entities, such as existing

³⁸ Xieping 谢平, Shuzi Renminbi Shiyongliang Buduo de Chubu Fenxi(数字人民币使用量不多的初步分析) [the initial analysis of why digital yuan is little used], <https://mp.weixin.qq.com/s/WAY6TUSlv4jMVJY2SfH0lw>; see also Former PBOC Official Says China's Digital Yuan is Little Used – Caixin, REUTERS (Dec. 29, 2022, 3:54 AM), <https://www.reuters.com/technology/former-pboc-official-says-chinas-digital-yuan-is-little-used-caixin-2022-12-29/>

³⁹ Mu Changchun, *Smart Contract and E-CNY*, CF40 (Sept. 19, 2022), http://www.cf40.com/en/news_detail/12852.html?_isa=1.

⁴⁰ *Progress of Research & Development of E-CNY in China*, PBOC (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

⁴¹ Yanghang Fuhangzhang Fan Yifei Chen Shuzi Renminbi Zhuyao Dingwei yu M0 Zhuanjia Jiedu huo Maixiang CBDC (央行副行长范一飞称数字人民币主要定位于 M0 专家解读或迈向 CBDC) [Vice Governor Fan Yifei stated that digital yuan was positioned as a M0; experts said (the central bank) is about to issue a CBDC] <https://finance.sina.cn/blockchain/2020-09-15/detail-iivhvpwy6781057.d.html>

⁴² *Id.*

mobile payment platforms (Alipay and WeChat Pay) and telecom companies. On the second layer, commercial banks and other authorized entities will distribute E-CNY to the general public.

As with existing fiat currency, the PBOC maintains the sole authority to issue E-CNY, which gives E-CNY the ultimate legal status as tender. For the general public, commercial banks and other authorized entities are still the major way to receive E-CNY. E-CNY users can download a digital wallet to store E-CNY, similar to using a physical wallet to hold cash. This model avoids disintermediating the financial system by leaving user interactions to commercial banks or other entities, and it also reduces the responsibilities and risk exposure of the central bank. At this point, it does not appear that the Chinese government is requiring individuals or businesses to create digital wallets, though the PBOC likely has the authority to make such a requirement, even if there would be logistical challenges to enforcing such a requirement.

3. A “Loosely Coupled” Design with Offline Transactions and Manageable Anonymity

To make E-CNY function more like cash, the PBOC invented a system called “loosely coupled account links” (松耦合), whereby transactions can happen between two E-CNY wallets.⁴³ Unlike traditional payment systems, in which transactions can only happen between two bank accounts, an E-CNY wallet does not need to be associated with a bank account to make transactions.⁴⁴ With an E-CNY wallet on each smartphone, users can transfer money by closely shaking two phones.⁴⁵ Transactions can be made offline, which functions more like cash. Therefore, using E-CNY requires a digital wallet. A digital wallet uses security chips and other technologies to enable the functions of E-CNY.⁴⁶ Thus, it may be supported by IC cards, mobile phones, wearable objects, and Internet of Things devices.⁴⁷

Because of its “loosely coupled” nature, E-CNY can achieve “manageable anonymity” (可控匿名) because many transaction details can be eliminated when transactions are made offline and between two wallets instead of going through the online banking system. “Manageable anonymity” refers to the fact that individuals and their transactions are not anonymous from the PBOC and any government entities with whom it shares information but can be anonymous vis-à-vis third party intermediaries, such as commercial banks and internet platforms.⁴⁸ Indeed, E-CNY claims to meet the public demand for anonymous small value payment services based on the risk features and information processing logic of current

⁴³ *Progress of Research & Development of E-CNY in China*, PBOC (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

⁴⁴ *Id.*

⁴⁵ *Id.*

⁴⁶ *Progress of Research & Development of E-CNY in China*, PBOC, 9 (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

⁴⁷ *Id.*

⁴⁸ Duan Xiangyu (段相宇), Guancha, Yanghang Shuzi Huobi Ruhe Yingxiang Niwo (观察, 央行数字货币如何影响你我) [Observations, How will Central Bank Digital Currencies Affect You and Me] https://www.ccdi.gov.cn/yaowen/202006/t20200607_219642.html

electronic payment system.⁴⁹ However, the anonymity is still manageable because a wallet can be deactivated, and a transaction can be reversed if suspicious or illegal activities are identified. The manageability comes from E-CNY's centralized governance system where the PBOC has access to all transaction data, unlike blockchain, in which a decentralized governance system dominates the network.

II. China's Additional Motivations for Issuing E-CNY

Central banks worldwide share similar motivations when experimenting with CBDCs. These motivations are potentially improving financial inclusion, reducing transaction costs in the payment system, enhanced capacity to combat money laundering and other financial crimes, facilitating cross-border payments, and improving payment diversity.⁵⁰ Similarly, it appears report does not need to reiterate all of them in detail.⁵¹ Instead, this report only focuses on three of China's additional and unique motivations that are distinct from other countries. First, China appears to be using E-CNY and novel regulations to address the duopoly of the mobile payment market. Second, China's experimentation with E-CNY has been sped up by Libra/Diem due to the perceived threat that Libra/Diem could potentially undermine the monetary sovereignty of the RMB. Third, it is also arguable that China has an agenda to use E-CNY to internationalize the RMB and circumvent sanctions.

A. Responding to the Cashless Economy and the Duopoly of Alibaba and Tencent in the Payment Market

The PBOC wants to promote digitalization in China and is reacting to decreasing demand for cash. Since 2000, the amount of currency issuance has risen from 13 trillion to 182 trillion yuan, but the proportion of paper cash in circulation decreases year by year.⁵² The decrease also indicates that households and businesses' access to paper cash is in decline. There is a danger that they will no longer have access to risk-free central bank money and are overly dependent on private platforms such as Alipay and WeChat pay that do not have the same mandate as the PBOC to protect against financial risk. Central banks usually consider it an obligation to provide

⁴⁹ *Progress of Research & Development of E-CNY in China*, PBOC, 7 (2021), <http://www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>.

⁵⁰ *Central Bank Digital Currencies: Foundational Principles and Core Features*, BIS (Oct. 9, 2020), <https://www.bis.org/publ/othp33.pdf>. For money laundering, see Robert Z. Mahari, Thomas Hardjono, & Alex Pentland, *AML by Design: Designing a Central Bank Digital Currency to Stifle Money Laundering*, MIT SCIENCE POLICY REVIEW (Aug. 29, 2021), <https://www.media.mit.edu/articles/aml-by-design-designing-a-central-bank-digital-currency-to-stifle-money-laundering/>. For financial inclusion, see <https://www.banking.senate.gov/imo/media/doc/Baradaran%20Testimony%207-30-19.pdf>; *IMF Seminar: CBDCs for Financial Inclusion: Risks and Rewards*, IMF, <https://meetings.imf.org/en/2022/Annual/Schedule/2022/10/14/imf-seminar-cbdc-for-financial-inclusion-risks-and-rewards>. Some experts are skeptical that digital money will make much of a difference by itself, see e.g. Nadir Mohammed, Jean Pesme, & Andrej Popovic, *Is Central Bank Digital Currency the Right Tool to Expand Financial Inclusion?*, WORLD BANK BLOGS (Dec. 1, 2022), <https://blogs.worldbank.org/allaboutfinance/central-bank-digital-currency-right-tool-expand-financial-inclusion>. For cross border payments, see *Central Bank Digital Currencies for Cross-Border Payments*, BIS (July, 2021), <https://www.bis.org/publ/othp38.pdf>.

⁵¹ PBOC, *supra* note 9, at 4.

⁵² <https://data.eastmoney.com/cjsj/hbgyl.html>

public access and that this access could be crucial for confidence in a currency. E-CNY could act like a “digital banknote” and could fulfill this obligation. China has moved rapidly toward a cashless economy in recent years due to the widespread development of mobile payment platforms. In 2019, with 851 million smartphone owners, 86% of China’s population used mobile payments to make purchases.⁵³ The total value of all mobile transactions in a single year was \$52 trillion (USD).⁵⁴ Therefore, the majority of China’s population is increasingly accustomed to cashless transactions.

However, the mobile payment market is dominated by two private companies, with Alibaba controlling 55.1% and Tencent 38.9%, giving the two an effective duopoly over trillions of dollars in mobile payments.⁵⁵ Two private companies dominating 94% of the market share creates financial risks. For instance, a disruption to their digital payment infrastructure could potentially cause serious short-term economic instability. Citizens placing a large amount of money in their Alipay or WeChat Pay wallets instead of commercial banks put strains on commercial bank deposits and drains money out of the traditional banking system. The bankruptcy of a private company could also be devastating. In addition, the government is not keen to cede control over payment systems to the private sector. Therefore, it is likely that the PBOC intends to centralize clearing mechanisms and enhance its own control over digital currency to not only serve as a backstop but also reduce the autonomy of these companies in the market and thus strengthen both the PBOC’s supremacy and financial stability and avoid disintermediating commercial banks. To be clear, the Chinese government does not want to entirely disintermediate existing companies or even change the fact that they are a duopoly. Rather, the infrastructure of E-CNY allows the PBOC, and whatever political forces to which the PBOC is beholden, to more directly exert pressure and control the behavior of the duopoly.

B. Responding to Cryptocurrencies and Diem⁵⁶

Internationally, the emergence of cryptocurrencies and Diem (previously called Libra) has definitely pushed the PBOC to explore its own digital currency. Cryptocurrencies, especially Bitcoin, again triggered intense debate over who should control money in the future.⁵⁷ The peer-to-peer payment system of Bitcoin also urged the world to rethink the merits and drawbacks of existing payment systems.⁵⁸ Some countries, particularly China and Russia, have criticized the

⁵³ *How Will a Central Bank Digital Currency Advance China’s Interests?*, CHINA POWER, <https://chinapower.csis.org/china-digital-currency/> (last visited Jan. 30, 2023).

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ DIEM, <https://www.diem.com/en-us/> (last visited Jan. 30, 2023).

⁵⁷ See, e.g. Anshu Siripurapu, *Cryptocurrencies, Digital Dollars, and the Future of Money*, COUNCIL ON FOREIGN RELS. (Sept. 24, 2022, 12:55 PM), <https://www.cfr.org/background/cryptocurrencies-digital-dollars-and-future-money>; Gita Blatt, *Reimagining Money in the Age of Crypto and Central Bank Digital Currency*, INT’L MONETARY FUND BLOG (Sept. 1, 2022), <https://www.imf.org/en/Blogs/Articles/2022/09/01/reimagining-money-in-the-age-of-crypto-and-central-bank-digital-currency>; Zongyuan Zoe Liu, *Besides China, Putin Has Another Potential De-dollarization Partner in Asia*, COUNCIL ON FOREIGN RELS. (March 11, 2022, 12:28 PM), <https://www.cfr.org/blog/besides-china-putin-has-another-potential-de-dollarization-partner-asia> (last visited Jan. 30, 2023).

⁵⁸ Siripurapu, *supra* note 57.

oversized role that the United States plays in the global financial system.⁵⁹ As the financial and monetary authority in the second-biggest economy, the PBOC has felt forced to rethink the role of the PBOC and the need to issue CBDC to compete with cryptocurrencies and optimize the payment system.⁶⁰ Therefore, one primary reason for the development and issuance of E-CNY is the maintenance of currency sovereignty.⁶¹

The Diem Association's efforts to launch its Diem payment system in 2019 directly sped up China's experiment with E-CNY because of the perceived threat to currency sovereignty. Compared to cryptocurrencies, which are often associated with high volatility, highly distributed or nonexistent internal governance, and technological issues making them unlikely to replace fiat money as a form of payment, Diem appeared to be a much stronger competitor to central bank money. With 2.7 billion monthly active users worldwide, if Diem had been widely adopted, the concern was that central banks would face the threat of losing control of tracking their citizens' financial activities and financial data within their jurisdictions to Diem. As of 2023, Diem has not been adopted and the project is stalled.⁶² Other stablecoin companies, such as Circle, however, could also appear threatening to the PBOC for similar reasons.

Significant adoption of money not denominated in the sovereign currency could see a national currency substituted by another with the domestic central bank gradually losing control over monetary matters and the domestic economy. This is a risk that the PBOC is very much concerned about—the widespread adoption of cryptocurrencies or stablecoins could diminish the use of RMB, which could further undermine the monetary sovereignty of the RMB and the capacity of the PBOC to manage China's economy. Therefore, to prevent this from happening, China has been speeding up its launching of E-CNY. It has also banned the mining and use of cryptocurrencies within its own financial system.⁶³

C. Internationalization of the RMB?

E-CNY is not only about fears of currency sovereignty, but also about China's capacity to compete internationally as a financial policy innovator. Some reports claim that China intends to internationalize its RMB with the use of E-CNY.⁶⁴ The prospects of increased internationalization of the RMB is a perennial topic, most recently with Xi Jinping's visit to

⁵⁹ Teddy Ng & Zhao Ziwen, *China and Russia Pledge to Step Up Efforts to Build Independent Trade Network to Reduce Reliance on US-led Financial System*, S. CHINA MORNING POST (Dec. 16, 2021, 5:30 PM), <https://www.scmp.com/news/china/diplomacy/article/3159941/china-and-russia-pledge-step-efforts-build-independent-trade>.

⁶⁰, PBOC, *supra* note 9, at 2-3.

⁶¹ *Id.* at 5, 6; Steffen Murau & Jens van 't Klooster, *Rethinking Monetary Sovereignty: The Global Credit Money System and the State*, PERSPS. ON POL., 1-18 (2022), <https://www.cambridge.org/core/journals/perspectives-on-politics/article/rethinking-monetary-sovereignty-the-global-credit-money-system-and-the-state/33EE76D8B70FB954A03BF1124B79AA5C>.

⁶² *Facebook-funded Cryptocurrency Diem Winds Down*, BBC (Feb. 1, 2022), <https://www.bbc.com/news/technology-60156682>.

⁶³ Francis Shin, *What's Behind China's Cryptocurrency Ban?*, WORLD ECON. F. (Jan. 31, 2022), <https://www.weforum.org/agenda/2022/01/what-s-behind-china-s-cryptocurrency-ban/>.

⁶⁴ Chen Jia, *E-CNY Certain to Promote Renminbi's Internalization*, CHINA DAILY, <https://global.chinadaily.com.cn/a/202107/29/WS610201faa310efa1bd66528b.html> (July 29, 2021, 9:18 AM).

Saudi Arabia and discussions around increasing the roll of the RMB in global energy markets.⁶⁵ China has had a long-standing interest in internationalizing the RMB,⁴⁶ an ambition that dates back to at least 2007. However, internationalization of the RMB may not be a key outcome of the development of E-CNY. This is because E-CNY, by itself, represents a technological tool while the barriers to the RMB's internationalization are more dependent on institutional development and the policy choices made by the PBOC and the Chinese government more broadly.⁶⁶

The internationalization of a currency involves many aspects of functions of money—a store of value, a medium of exchange, a unit of account, and sometimes, a standard or deferred payment.⁶⁷ Currency digitalization is an innovation in the area of payment but does not cover all other aspects. A country's currency becoming an international currency depends fundamentally on that country's economic, political, technological, and military capacities and influence. The mere change of form or the digitalization of the RMB will not make the RMB an international currency. To truly internationalize the RMB, China would need to do much more, such as promoting market-oriented reforms, developing the RMB offshore market, loosening capital controls, further developing rule of law, and welcoming foreign investments. As Henry Paulson Jr. suggested, China would need to develop efficient and well-regulated financial markets that earn the respect of international investors so that China can eliminate capital controls and turn the RMB into a market-determined currency.⁶⁸ Current trends towards the internationalization of the RMB, to the extent that they exist, are not focused on the use of a digital vs. more traditional currency. Rather, economists appear to be more focused on the popularity of the RMB bond market and growing potential risks in the United States.⁶⁹

E-CNY's geopolitical implications, however, extend beyond the internationalization of the RMB. The E-CNY could help advance China's foreign policy goals in other ways. For example, one considered impact of E-CNY, or more accurately, the greater development of a digital infrastructure for the use of the RMB more internationally, is that it would help China engage with countries targeted by U.S. or other sanctions by allowing Chinese companies to transact with sanctioned entities using a currency and intermediaries (whether banks or some other institution) that are not integrated in or dependent on the U.S. led global financial system.⁷⁰ One relatively unconsidered dynamic, however, is that this would remove the possibility for China's government to plausibly deny engaging in transactions prohibited by the

⁶⁵ Teddy Ng, *China Pushes to Boost Role of Yuan in Global Energy Markets as Xi Jinping Wraps Up Saudi Arabia Visit*, S. CHINA MORNING POST (Dec. 10, 2022, 5:25 PM), <https://www.scmp.com/news/china/diplomacy/article/3202831/china-pushes-boost-role-yuan-global-energy-markets-xi-jinping-wraps-saudi-arabia-visit>.

⁶⁶ Michael Pettis, *Changing the Top Global Currency Means Changing the Patterns of Global Trade*, CARNEGIE ENDOWMENT FOR INT'L PEACE (April 12, 2022), <https://carnegieendowment.org/chinafinancialmarkets/86878>.

⁶⁷ Irena Asmundson & Ceyda Oner, *What is Money?*, INT'L MONETARY FUND (Sept. 2012), <https://www.imf.org/external/pubs/ft/fandd/2012/09/basics.htm>.

⁶⁸ Henry M. Paulson Jr., *The Future of the Dollar*, FOREIGN AFF. (May 19, 2020), <https://www.foreignaffairs.com/united-states/future-dollar>.

⁶⁹ Martin Chorzempa, *China's Pursuit of Leadership in Digital Currency*, PETERSON INST. FOR INT'L ECON. (April 15, 2021), <https://www.piie.com/commentary/testimonies/chinas-pursuit-leadership-digital-currency>.

⁷⁰ Kumar, *supra* note 7.

U.S. government or any other political institution if such “prohibited” transactions are conducted in E-CNY. Because the PBOC would have to clear every transaction, it could not feign ignorance as to the existence or nature of the transaction if a foreign government knows that the transaction was conducted in E- CNY.

There is a great deal of talk and concern in the media about China’s grand ambitions with the E-CNY. While the government may harbor many such ambitions, E-CNY at this stage is only modestly different than existing money. One of the PBOC’s key motivations appears to be cultivating the talent and institutional knowhow to develop digital currencies and be able to flexibly respond to the impact of digital currencies as they are developed and deployed across the world, whatever that impact happens to be. Aside from plans of RMB domination or greater social control, the PBOC likely wants to be prepared for the unknown contingencies that come from digital currencies. By developing E- CNY, they are also developing the capacity to be more prepared for an unknown, more digital future.

III. What are the Potential Impacts of E-CNY?

There remains a great deal of mystery and questions around the development and deployment of E-CNY. Below is a discussion regarding the potential impacts considering currently public information.

A. Impacts on Cost and Efficiency

It’s unclear if the E-CNY will help the PBOC reduce the net costs of currency creation and distribution. Although the PBOC could reduce the cost of running the cash-based system, additional expenditures, such as server space and the costs of running the new institutions responsible for E-CNY, will lead to other costs. Establishing the entire E-CNY system and relevant financial infrastructures will likely not be cheap or easy. It is possible that, by shifting to a digital currency that is free for individuals and businesses to use, the PBOC is engaging in a cost-shifting mechanism away from merchants. The PBOC itself will be more directly responsible for the infrastructure of the currency and transactions made with it but holding and transacting with E-CNY will be cheaper for individuals and businesses. Realizing these goals, however, requires more than just developing a digital currency; it requires building institutions that connect the PBOC with financial intermediaries and individuals and organizations in a trusted, secure, and fluid network with a digital currency that is easy to use. Such a project is about more than just technology.

One key argument is that, as a digital currency, E-CNY’s most obvious benefit is faster, cheaper, and more efficient payments, both domestically and cross border.⁷¹ This argument is similar to arguments about the benefits of digital currencies (including cryptocurrencies) more generally and is based on the digital nature of E-CNY which, in theory, can provide for frictionless transactions. Yao Qian touts the virtues of digital currencies as programmable and “intelligentized” that will allow for greater affordances, such as smart contracts and account-

⁷¹ Bank for International Settlements, *supra* note 50; see also *Central Bank Digital Currency (CBDC) Frequently Asked Questions*, FED. RSRV., <https://www.federalreserve.gov/cbdc-faqs.htm> (last visited Jan. 31, 2023).

less access, and other tools that could benefit consumers.⁷² To be clear, this is mostly theoretical at this point. A potential problem is that many of the “frictions” involved in transactions are not physical or technical, but rather social and legal. Transaction costs will still play a large and complex, if different role in digital currency transactions.

Current pilots of E-CNY have generally been far more lackluster and quotidian; there have not been “intelligentized” or programmable pilot uses of E-CNY that have added more affordances for users compared to regular fiat currency. The main benefit in these pilot cases appears to be that the government is handing it out for free.⁷³ E-CNY has been “programmed” to the extent that pilot cases have limited the context and extent to which consumers can use E-CNY, such as with specific retailers or for a particular purpose (like consumption).⁷⁴ In this sense, E-CNY is more like digital gift cards. So far, E-CNY’s only real distinction from using apps in China’s highly mobile payments ecosystem is that, with E-CNY, the government can limit what you do with your money in more targeted ways. From this perspective, it is unclear why consumers in or outside of China would want to readily adopt or use E-CNY. To date, the government has basically had to pay people to use it; doing so on a scale to encourage mass use and adoption would be prohibitively expensive and unsustainable. Former PBOC official Xie Ping has confirmed limited adoption of E-CNY so far.⁷⁵

B. Impacts on the Payment System and the Mobile Payment Duopoly

The impact on the existing payment system depends significantly on how the PBOC deploys E-CNY. The PBOC seems to emphasize the roles of existing intermediaries, especially commercial banks. In the two-tier design of E-CNY, the PBOC decides to rely on commercial banks and other entities as intermediaries to distribute E-CNY. Thus, the role of commercial banks and these entities would remain significant and maintain several similarities with their roles in the current economy. This of course raises the question of what exactly is different about E-CNY. Like other topics discussed above, the goals inherent in the development and deployment of E-CNY could be quite ambitious. With the current state of E-CNY, however, a little bit of digging and investigation reveals a more banal reality.

As mentioned above, one of the reasons that the PBOC has launched E-CNY is to address Alibaba and Tencent’s duopoly in the payment market. Since the PBOC could choose to clear transactions and have expanded insights into the nature and contexts of transactions, Alipay

⁷² Xuzhong, Yaoqian (徐忠, 姚前), Shuzi Piaoju Jiaoyi Pingtai Chubu Fangan(数字票据交易平台初步方案) [initial plan of the exchange platform for digital notes]

https://www.8btc.com/books/834/cnfinance201617/_book/content/10.html

⁷³ Enoch Yiu, *Bank of China Offers Customers E-Laisse to Promote Retail Use of Digital Yuan in Hong Kong*, S. CHINA MORNING POST (Dec. 12, 2022, 8:35 AM), <https://www.scmp.com/business/banking-finance/article/3203037/bank-china-offers-customers-e-laisse-promote-retail-use-digital-yuan-hong-kong>

⁷⁴ *China Uses Digital Yuan to Stimulate Virus Hit Consumption*, REUTERS (May 30, 2022, 7:26 AM), <https://www.reuters.com/markets/currencies/china-uses-digital-yuan-stimulate-virus-hit-consumption-2022-05-30/>.

⁷⁵ Xieping(谢平), Shuzi Renminbi Shiyongliang Buduo de Chubu Fenxi(数字人民币使用量不多的初步分析) [the initial analysis of why digital yuan is little used] <https://mp.weixin.qq.com/s/WAY6TUSlv4jMVJY2SfH0Iw>; See also, *Former PBOC Official Says China’s Digital Yuan is Little Used – Caixian*, REUTERS (Dec. 29, 2022, 3:54 AM), <https://www.reuters.com/technology/former-pboc-official-says-chinas-digital-yuan-is-little-used-caixin-2022-12-29/>.

and Tencent could lose a great deal of de facto independence and maneuver room with more widespread adoption of E-CNY, particularly if E-CNY deployment decreases their role as intermediaries and/or places more rules on what they can do in terms of data collection and analysis as intermediaries. At the very least, the PBOC would have more leverage over Alipay and Tencent with a widely used E-CNY serving as a digital tether. The onset of E-CNY could also catalyze the PBOC's own rulemaking and attempts to expand control over the duopoly, even if the mechanisms of such expansion are not related to E-CNY directly.

For example, the PBOC and Chinese government more broadly are already chipping away at Alipay and WeChat Pays' combined power. New rules passed in 2021 require Alibaba and Tencent (as well as other tech companies) to share their data with the PBOC and other regulators. This data sharing went into effect in December 2022.⁷⁶ Despite some remaining logistical hurdles for implementation,⁷⁷ this data sharing requirement changes the nature of the relationship between tech companies and the PBOC and other regulators. This has all taken place in the context of a broader political and regulatory crackdown by the Chinese government against tech companies, including Alibaba and Tencent.⁷⁸ While not every piece of the tech crackdown targets fintech or digital payment platforms per se, it does represent a broader shift in the relationship between the government and tech companies. Digital payments and the future of E-CNY should be viewed in the context of this changing relationship.

Netting serves as another example. Since 2017, a new rule required mobile payment companies to clear their transactions through a stated-owned clearing corporation, NetsUnion Clearing Corporation Ltd (网联清算有限公司), a partially state but majority private owned entity, with a number of tech companies including Alibaba and Tencent having significant shares. While the state has already taken a greater role in mobile payment transaction clearing, Alipay and Tencent still have a great deal of flexibility when it comes to netting and otherwise managing funds controlled on their platforms. E-CNY, allowing the PBOC to clear more transactions itself, would likely have an impact on how these digital platforms handle their consumers' money flows. Currently, a highly detailed understanding of how Alipay and WeChat Pay handle transactions and the flow of money is possibly only known by the companies themselves. Even though they have to clear a majority of transactions via NetsUnion, they have a great deal of autonomy in handling their funds between transactions. The fact that NetsUnion is also a mostly private entity also places at least logistical limits on the PBOC and other government agencies' access to clearing and data. E-CNY makes the PBOC (and the government by extension) a primary actor with direct oversight of and influence over how the companies manage their customer's funds. The duopoly might have less flexibility and leeway with growing deployments of E-CNY. What exactly the PBOC would do with this leverage remains to be seen. In theory, when the government created NetsUnion, it could have established it as a state-owned enterprise within the PBOC or government regulator. It did not. Now, with E-CNY, the government is granting the PBOC

⁷⁶ Jimmy Choi, *PBOC Pushes Big Techs to Hand over User Data, Report Says*, CENT. BANKING (Nov. 25, 2022), <https://www.centralbanking.com/central-banks/financial-stability/7953792/pboc-pushes-big-techs-to-hand-over-user-data-report-says>.

⁷⁷ Sun Yu, *China's Central Bank Struggles to Force Tech Groups to Share User Data with State*, FIN. TIMES, <https://www.ft.com/content/75409a44-6cfb-43e9-be31-776eb814a919>, (last visited Jan. 31, 2023).

⁷⁸ *China's Big Tech Crackdown: A Complete Timeline*, THE CHINA PROJECT, <https://thechinaproject.com/big-tech-crackdown-timeline/>, (last visited Jan. 31, 2023).

the power to oversee and clear such transactions itself. Whatever the motivations, these dynamics give the PBOC greater capacity for more direct oversight and control.

E-CNY could also take away some market share that these two companies currently possess. Merchants potentially have the economic motivation to switch to E-CNY because it is free for merchants to transact with E-CNY while Alipay and WeChat Pay charge merchants fees. Consumers, on the other hand, seem to be less motivated because it is free for them to use either E-CNY or Alipay/WeChat Pay. Alipay and WeChat pay have the advantage of momentum- consumers are already used to using their platforms pretty ubiquitously. Besides, the digital wallet underlying E-CNY is similar to digital wallets for Alipay and WeChat Pay, suggesting that the “user experience” for digital currencies will be similar to existing models, or at least that the PBOC is attempting to make them so. It could even be more difficult for consumers to adopt to E-CNY as they are so accustomed to Alipay and WeChat Pay. However, E-CNY, backed by the PBOC as the state agency competing with private companies, has more power to dissuade consumers from using the incumbents by force. For instance, mandates could require salaries or government subsidies to get paid with E-CNY.

Going forward, it is likely that Alipay and WeChat Pay will likely be both competitors and crucial partners of the PBOC. They are competitors because they all hunt for more users in the payment market. They are partners because the PBOC intends to rely on Alipay and WeChat Pay as the second-tier distributors of E-CNY. Alipay and WeChat Pay could greatly help with E-CNY circulation because of their strong networks and widespread application scenarios. It is unwise to nudge them out of the market entirely. There could be other markets to explore. According to interviews with employees, Alipay does not have enough information to predict how specifically a digital currency will impact the payments environment or their business in particular. One employee stated: “As people pioneered different kinds of money, they created different kinds of markets.”⁷⁹

C. Impacts on Monetary Policy

Widespread adoption of E-CNY could give the PBOC greater capacity to develop and deploy mechanisms of monetary policy. This greater capacity in theory offers both advantages and disadvantages. A digital currency offers the capacity for more tailored, specific, and siloed interventions into the economy, both by controlling the flow of currency as well as by controlling interest rates more directly. It is important to reiterate that this is all still theoretical. Each of these affordances depends on a highly developed digital infrastructure to accommodate E-CNY as well as actual widespread use. The PBOC has so far chosen not to make E-CNY interest bearing by itself.⁸⁰ While a digital currency potentially offers more flexibility, it likely will not solve structural economic problems without the addition of institutional innovation and reform. Implementing a digital currency to such an extent that the PBOC and other regulators could actually take advantage of the network effects required to use such affordances depends on more than the mere development of a digital wallet and digital RMB. The PBOC and the government

⁷⁹ Shuzi Huobi, he Zhifubao, Weixin Zhifu Youshenme Qubie? (数字货币, 和支付宝、微信支付有什么区别?) [what are the differences between digital currency, Alipay, and WeChat Pay] <http://blockchain.people.com.cn/n1/2020/0827/c417685-31838908.html>

⁸⁰ PBOC, *supra* note 9 at 7.

more broadly would need to find a way to actually realize the widespread use of E-CNY and develop the personnel and knowledge to take advantage of all the new information and capabilities that the new currency provides.

D. Impacts on BRI countries

E-CNY could have more of an impact in countries that have (1) populations that have a more integrated economic relationship with China and that are accustomed to utilizing Chinese consumer services, (2) that do not have strongly established financial systems and, (3) that might be drawn to mobile payment systems. Many countries participating in the Belt and Road Initiative (BRI), for example, could have great potential for burgeoning digital payments markets. Since the BRI involves Chinese companies, the use of a more frictionless E-CNY might encourage more consumers in BRI countries to utilize the yuan in digital form, thus spurring increased international use of the RMB and establishing the PBOC as a de facto international clearinghouse. As of yet, none of this has happened. E-CNY's pilots have remained overwhelmingly domestic, and consumers in Africa's largest economies, for example, continue to use forms of payment other than Chinese tech platforms tied to the yuan.⁸¹ However, BRI countries might also be reluctant to be increasingly beholden to the Chinese government. These countries might be choosing to transact in dollars not only because the USD is the international reserve currency but also to partially hedge China's potential influence over their nations' growing infrastructure and financial systems.

E. Impacts on International Settlements

It is unclear how E-CNY will affect international settlements, though some have made arguments that one goal and outcome of E-CNY will be to undermine the role of the dollar as an international reserve currency or otherwise challenge the U.S.'s power as the global financial nexus.⁸² CIPS and other SWIFT alternatives already exist without the need for digital currencies. It appears that many barriers to setting up international settlement systems are not technical ones but have more to do with legal, institutional, policy and other non-technical barriers. New institutions that China sets up in conjunction with E-CNY could change international finance. For example, if the Chinese government further improved market access and lessened convertibility restrictions in conjunction with implementing a digital currency then international governments, businesses, and other actors might be more inclined to use a Chinese backed, SWIFT alternative.

But it's unlikely a digital currency, by itself, would greatly change international settlement systems. It's unclear how E-CNY itself could improve market access, lessen convertibility

⁸¹ Statista, *Distribution of Online Payment Methods in Selected African Countries as of 2021*, <https://www.statista.com/statistics/1190895/distribution-of-online-payment-methods-in-african-countries/>, (last visited Jan. 31, 2023).

⁸² Eustance Huang, *China's Digital Yuan Could Challenge the Dollar in International Trade This Decade, Fintech Expert Predicts*, CNBC (Mar. 15 2022, 2:22 AM), <https://www.cnbc.com/2022/03/15/can-chinas-digital-yuan-reduce-the-dollars-use-in-international-trade.html>; Zongyuan Zoe Liu, *China is Quietly Trying to Dethrone the Dollar*, FOREIGN POL. (Sept. 21, 2022, 3:59 PM), <https://foreignpolicy.com/2022/09/21/china-yuan-us-dollar-sco-currency/>.

restrictions, or address rule of law concerns. For example, many complaints about current international clearing systems involve the slow speed at which transactions can take place as well as the expense of transferring money across borders. The time and expense involved, however, appear to be more due to the gatekeeping capacities of banks and regulatory requirements of different countries, rather than specific technological issues. A digital currency might change the specific dynamics of who can gatekeep and how, but it will not eliminate further institutional, legal and policy barriers.

IV. What are the Challenges Facing the Development and Deployment of E-CNY?

One of the key challenges associated with E-CNY development and deployment is the uncertainty of data access and data usage. This uncertainty raises a series of questions: Who has access to what information? How will the state guarantee due process rights regarding access to and use of data? How will the state and intermediaries protect users' privacy? Additional challenges include a lack of technological transparency and cybersecurity threats.

A. The Uncertainty of Information Access and Use

The purely informational nature of E-CNY raises challenges about information access and protection- to what information do which government agencies have access? How does tracking, investigating, and suspending accounts work? Since it has to clear all transactions, the PBOC will have complete access to information concerning transactions using E-CNY. What about other government agencies? It seems clear that other agencies will need access to this information, including law enforcement, tax authorities, and others. What are the rules that govern access to this information? Will local governments have any access to the PBOC's information?

While there are already existing rules detailing the sharing of government information among government agencies, including the Notice of the State Council on Issuing the Interim Measures for the Administration of Sharing of Government Information Resources (the Measures)⁸³ and Guidelines for the Preparation of Catalogues of Government Information Resources (the Guidelines)⁸⁴ – are supposed to govern how government agencies share and access information, their specific applicability to E-CNY remains unclear. The Measures specify four principles regarding how government information should be shared, and require that government information should be divided into three categories: unconditional sharing, conditional sharing, and non-sharing. The Guidelines require all government departments to compile, maintain and update their catalogues of government information resources. However, the Measures do not clearly define or enumerate what information belongs to which category

⁸³ Guowuyuan Guanyu Yinfa Zhengfu Xinxi Ziyuan Gongxiang Guanli Zaxing Banfa de Tongzhi (国务院关于印发政府信息资源共享管理暂行办法的通知) [the Notice of the State Council on Issuing the Interim Measures for the Administration of Sharing of Government Information Resources] http://www.gov.cn/zhengce/content/2016-09/19/content_5109486.htm

⁸⁴ Zhengfu Xinxi Ziyuan Muli Bianzhi Zhinan (Shixing) (政务信息资源目录编制指南（试行）)[Guidelines for the Preparation of Catalogues of Government Information Resources (the Guidelines)] <https://www.gov.cn/xinwen/2017-07/13/5210203/files/2415d43d2bcb4dfe9c3f1e1b5c0626c1.pdf>

and how to specifically differentiate sharable and non-sharable information. Therefore, it is unclear if E-CNY information collected by the PBOC is sharable and if yes, should it be shared conditionally or unconditionally? Although the Guidelines do enumerate four categories (and a few secondary catalogues) of government information resources, it is still unclear if E-CNY information fits into one of these.

Some more broadly applicable legislation aimed at data protection, such as the Data Security Law⁸⁵ (DSL) and the Personal Information Protection Law⁸⁶ (PIPL), have clauses nominally placing limits on how the state can collect, utilize, and analyze data. However, these clauses are quite vague and it is unclear how they are being enforced generally, let alone in the context of E-CNY. How will individuals know that government agencies and private companies are following the law either the DSL or PIPL? In terms of some unanswered questions, the PBOC should consider various transparency mechanisms, such as releasing periodic transparency reports detailing such information, to alleviate the concerns of individuals and businesses.

On top of that, it is unclear how exactly citizen rights will be enforced under this existing paradigm. The Guidelines mandate that the National Development and Reform Commission shall be responsible for creating and organizing an information-sharing platform.⁸⁷ It also orders the creation of an “Inter-Ministerial Joint Meeting for Big Data Development” made up of departments from the State Council and local governments that is responsible for “the overall planning and coordination of sharing of government information resources... and inspection of the implementation of the sharing of government information resources.”⁸⁸ This is a complex task all on its own. Combined with the general opacity that is typical of Chinese intergovernmental regulation and disciplining, the general public appears to have no way to monitor or confirm that government agencies are protecting their information. Therefore, it would be helpful if this “Joint Meeting” published transparency reports detailing the extent to which government agencies follow the guidelines.

There are additional questions related to law enforcement and national security agencies’ access to information as well. For example, the Australian Strategic Policy Institute has published a report in which they highlight some of the concerning ways that the Ministry of State Security is involved in the E-CNY project.⁸⁹ What kind of access will the Ministry of State Security have to the PBOC’s trove of E-CNY related information? In addition to the PBOC itself, intermediaries involved in the deployment of E-CNY must necessarily have access

⁸⁵ P.R.C. DATA SEC. PROT. LAWS, art. 38,

<http://www.npc.gov.cn/englishnpc/c23934/202112/1abd8829788946ecab270e469b13c39c.shtml>.

⁸⁶ P.R.C. PERS. INFO. PROT. LAWS, http://en.npc.gov.cn.cdurl.cn/2021-12/29/c_694559.htm.

⁸⁷ Zhengfu Xinxi Ziyuan Muli Bianzhi Zhinan (Shixing) (政务信息资源目录编制指南 (试行)) [Guidelines for the Preparation of Catalogues of Government Information Resources (the Guidelines)] <https://www.gov.cn/xinwen/2017-07/13/5210203/files/2415d43d2bcb4dfe9c3f1e1b5c0626c1.pdf> at 4

⁸⁸ Zhengfu Xinxi Ziyuan Muli Bianzhi Zhinan (Shixing) (政务信息资源目录编制指南 (试行)) [Guidelines for the Preparation of Catalogues of Government Information Resources (the Guidelines)] <https://www.gov.cn/xinwen/2017-07/13/5210203/files/2415d43d2bcb4dfe9c3f1e1b5c0626c1.pdf> at 12

⁸⁹ Samantha Hoffman, et al., *The Flipside of China’s Central Bank Digital Currency*, AUSTRALIAN STRATEGIC POL. INST. (2020), <https://www.aspi.org.au/report/flipside-chinas-central-bank-digital-currency>.

to at least some information involved in E-CNY transactions. What rights and responsibilities do they have regarding this information? For example, will the way that Alipay and WeChat Pay treat user information and the analytics surrounding it change with E-CNY? What about other intermediaries? It is clear that the amount of data collected from E-CNY could be useful and valuable under the right circumstances. To what kinds of uses will all of this accumulated data be put? What kinds of rules and regulations are necessary to incentivize the productive use of this data while simultaneously protecting individual privacy and the integrity of the system as a whole?

These questions are important for reasons of information security and the protection of individual rights. Increased government access to transaction information raises serious questions about privacy and free expression. In theory, this information could be used to spy on and coerce individual account holders for reasons other than criminal activity. It would be beneficial for the rights of users as well as the viability of E-CNY if the National People's Congress (NPC) articulated clear rules regarding how the PBOC can share collected data with third parties, including other government agencies and private companies. For example, there are existing rules that strictly govern the amount and kinds of information that the PBOC shares with credit rating agencies as well as what credit rating agencies can do with this information. It would also be necessary for these rules to include clear and transparent enforcement mechanisms that can be monitored by the public.

However, at this stage, it is unclear how much, if any, information collected by the PBOC in conjunction with E-CNY will fall under these provisions. These existing regulations, however, could at least serve as a potential model for future regulations on information sharing and usage for E-CNY. The NPC, or at least PBOC, should also issue clear rules articulating the duties of intermediaries, whether they be traditional commercial banks, online mobile empires, or other entities regardless of their status as a government or private entity.

B. Due Process Challenges

Widespread deployment of E-CNY would potentially offer the PBOC, and Chinese government by extension, unprecedented, real time influence over the economic rights and capabilities of individuals. Currently, central banks and law enforcement often need to rely on the cooperation and compliance of intermediaries to investigate and enforce laws related to financial crime. This includes legal actions against individuals committing financial crimes such as money laundering as well as entities subject to government sanctions. Such institutional frictions increase the incentives for governments to act within legal bounds. In theory, the fact that the PBOC or other government entity could monitor more transactions conducted with E-CNY would give relevant authorities the power to unilaterally halt transactions and effectively freeze individuals or institutions out of the financial system. Absent additional mechanisms, individuals and businesses would just have to assume that the PBOC is doing so legally.

For example, online payment intermediaries govern the closing of accounts based on their terms of services (which are often opaque and not very specific). Will the government have this power to shut off a user from accessing their digital wallet and digital currency? Losing access to one's Alipay or WeChat account is likely quite devastating to certain actors

in certain circumstances. But the PBOC's denials of access to E-CNY accounts could result in greater consequences. If one loses their Alipay account, they could start another one, including with another platform. If the PBOC decides to cut off their access to using E-CNY, it is unclear what alternatives such a person or entity might have, particularly if wider use of E-CNY reduces the use of paper currency. As a result, it seems necessary to clearly articulate under what circumstances the PBOC or other relevant authority can halt a transaction and further shut off an E-CNY account, what procedures to follow, and what rights individuals regarding their own digital wallets and the E-CNY contained therein. There may already be a litany of laws that govern information sharing for government agencies and private entities, but it would be helpful if the NPC and PBOC more clearly articulated the rights of citizens and the responsibilities of every entity involved in E-CNY.

C. Privacy Protection Challenges

The amount of information collection that a digital currency enables raises serious questions about privacy, both in terms of private companies as well as from governments. Current rules suggest that both the PBOC and commercial banks, at a minimum, will collect copious amounts of information about businesses, individuals, and their transactions. Digital payment platforms already collect large amounts of information. Given the broad extent of information collection, how will the PBOC protect users' privacy? The PBOC's proposed 'manageable anonymity' is ambiguous and leaves many unanswered questions.

The Civil Code of the PRC (the Civil Code), which came into effect on January 1, 2021, could address some of the privacy issues here and mandate the protection of personal information.⁹⁰ Article 1034 of the Civil Code states that personal information of natural persons is protected by law and defines personal information as "various information recorded electronically or in other forms that can identify a specific natural person separately or in combination with other information, including a natural person's name, data of birth [...] and whereabouts information, among others."⁹¹ Under this definition, relevant information of E-CNY, such as account information and transaction information, most probably can "identify a specific person" either separately or in combination with other information, and thus should, in theory, be in the category of personal information protected by law.

Article 1035 specifies the principles and conditions of processing personal information. The PBOC and other entities processing relevant E-CNY information might have to follow these rules.⁹² Article 1029 specifically addresses the roles of state organs, statutory institutions assuming administrative functions, and their staff members.⁹³ They should protect the privacy and personal information obtained in the course of fulfilling their duties. Here, as a major personal information processor, the PBOC thus has a legal responsibility to keep confidential the privacy and personal information of E-CNY users and activities.

⁹⁰ Zhonghua Renmin Gongheguo Minfadian (中华人民共和国民法典) [the Civil Code of the People's Republic of China] <http://www.npc.gov.cn/npc/c30834/202006/75ba6483b8344591abd07917e1d25cc8.shtml>

English version: <http://lawinfochina.com/display.aspx?lib=law&id=32806>

⁹¹ *Id.*

⁹² *Id.*

⁹³ *Id.*

Any violations of the law should be subject to punishment in theory. However, the Civil Code has not specified which department is in charge of enforcing these laws. It is also not clear that private citizens have any capacity to investigate or otherwise enforce their rights against government agencies in this capacity. Article 1039 briefly mentions any personal information leakage, tampering, or loss should be reported to the “competent department.”⁹⁴ The NPC, State Council, or PBOC should each specify what government agencies are responsible for monitoring compliance as well as how individuals can otherwise confirm that their rights are otherwise being protected.

The PIPL could also address some of the privacy concerns. For instance, where personal information processors provide a third party with the personal information they process, the law requires that they notify the individuals of the third party’s relevant information and shall obtain independent consent from the individual.⁹⁵ Where personal information processors provide anonymized information to a third party, the third party must not use technology or other means to re-identify the individuals. When dealing with sensitive information, such as financial information (e.g. E- CNY transactions in this case), personal information processors must demonstrate a specific purpose and necessity for the collection of sensitive data and shall obtain the individuals’ independent consent. Article 34 specifically requires that government agencies in China only collect information needed for the course of their duties, and section 3 generally places responsibilities and limits on government agencies when it comes to the collection, use, and sharing of citizen data.⁹⁶ In practice, it is unclear how this all works, including in relation to information collected for E-CNY. Overall, the law could have an important role to play, but questions about enforcement agencies and mechanisms remain.

However, it is currently unclear if this law will manifest its intended purpose. Some articles are ambiguous, which could have negative impacts on protecting users’ privacy. For instance, without obtaining consent from the individuals, personal information processors (in this case, it could be the PBOC and other entities distributing and circulating E-CNY) can process personal information to “carry out acts such as news reporting and public opinion oversight in the public interest.”⁹⁷ This article is open to interpretation – “public opinion oversight” and “public interest” could have many different meanings. Rules like this could give the PBOC and other relevant entities rights to process or disclose personal information in excess of needs. At this stage, there does not appear to be any oversight body or mechanism that would manage this issue with any kind of public transparency.

However, greater transparency comes with tradeoffs. More disclosures about technical details could provide more information to potential hackers and other saboteurs. A digital currency relies on digital technologies. Traditionally, nefarious actors have stolen money by counterfeiting the currency, impersonating other individuals to use their money, or by stealing currency directly (such as by robbing a bank). A digital currency changes but does not remove these risks. E-CNY will likely become a tempting target for hackers; nefarious actors might try

⁹⁴ *Id.*

⁹⁵ P.R.C. PERS. INFO. PROT. LAWS, <http://en.npc.gov.cn.cdurl.cn/2021-12/29/c694559.htm>.

⁹⁶ *Id.*

⁹⁷ *Id.* at art. 13, § 5.

and attack the E-CNY infrastructure, both for reasons of counterfeiting currency as well as attacking China's financial system. Nefarious actors might also try to find ways to impersonate others' digital wallets to access their digital money. There have already been publicly confirmed examples of counterfeit wallets for E-CNY.

D. Responsibilities of Intermediaries

Thus far, there appears to be a lack of transparency, both technical and legal, in terms of the specific expectations that the PBOC has of commercial banks and other intermediaries, particularly digital payment platforms such as Alipay and WeChat Pay. It is clear that the PBOC will implement E-CNY by continuing to rely on commercial banks and other entities to distribute E-CNY. The details of how these relationships work matter, because absent clear legal or institutional changes, it is unclear how E-CNY will change the role or capacities of commercial banks.

It will also change the roles of other intermediaries, such as mobile payment platforms, telecom companies, and whatever other companies the PBOC permits to host E-CNY wallets. Will these entities adopt certain powers traditionally limited to government agencies? Commercial banks may be already accustomed to complying with strict and complex laws related to consumer protection and financial stability, as well as anti-money laundering (AML) and Know Your Customer (KYC) laws. There might be a steeper learning curve for other kinds of institutions. How will E-CNY change the relationship between the PBOC and commercial banks? How will it change the relationship between commercial banks and individual consumers and private businesses? At this stage, it is likely that the PBOC will somehow involve traditional banks, the mobile payments duopoly, and other companies in the process of E-CNY implementation and deployment, but the exact role to be played by Alipay and WeChat Pay, and the future of their relationships with the PBOC and consumers is unclear. In an interview with the *Financial Times*, Alipay employees stated that they "do not have sufficient visibility as to the impact of the E-CNY on consumers' payment behavior and the payment industry" to understand its role at this time.⁹⁸ They stated that "it is not clear how the E-CNY will fit into or change the current digital payment industry landscape."⁹⁹ So far, it appears that the Chinese government is taking a very cautious approach to deploying E-CNY. This is likely a prudent move, but the lack of transparency is concerning.

V. Additional Legal Questions Surrounding E-CNY

There are additional legal questions surrounding the development and deployment of E-CNY. Currently, the Chinese government has a draft update of the Law of the PRC on the People's Bank of China that would ensure that the PBOC has all due legal authority to issue a

⁹⁸ Alison Tudor-Ackroyd, *What Will China's Central Bank Digital Currency Mean for Alipay and WeChat Pay?*, S. CHINA MORNING POST (Sept. 5, 2020, 10:00 AM), <https://www.scmp.com/business/banking-finance/article/3100285/what-will-chinas-central-bank-digital-currency-mean-alipay>.

⁹⁹ *Id.*

digital currency, which is slated to take effect in the spring of 2023.¹⁰⁰ If history is any indication, creating a currency also involves creating a set of institutions as well as a market. As such, it might be important to further enshrine the articulation, legality, and functions of all the actors involved in E-CNY more clearly.

Anti-money laundering is an additional concern. In theory, a digital currency allows for the government to have greater insight into and control over transactions. This suggests that the government will have more tools to combat money laundering. As discussed above, this is also a key goal of the Chinese government in deploying E-CNY— a greater capacity to combat financial crime. On the other hand, like many other issues discussed above, money laundering is often not a problem of control over transaction clearing but rather of contextual intelligence and being able to confirm that the right actors are engaging in an appropriate transaction with funds that belong to them. Digital technology offers novel tools to confirm identities and prevent counterfeiting but they are not foolproof. It is unclear at this stage how the PBOC will develop the infrastructure to confirm the prerequisite authenticity of each aspect of each transaction. Greater access to data will allow for broader analysis, but it is possible that money laundering and other forms of financial crime will remain a kind of cat and mouse game; a digital currency will change the way the game is played.

Fraud also raises potential legal challenges. The issue of fraud raises both practical and legal questions. All currencies face the problem of counterfeits, identity theft, and currency theft. A digital currency will likely face similar challenges. As of yet, there does not appear to be a way for digital currencies and transaction clearing mechanisms to be any more “sure” of identities and funds than existing systems. More details about identity verification would help clear up some of these questions. This is a practical problem. Legally, in addition to needing to be able to prosecute fraud, governments will also need to have mechanisms in place to respond to incidents of fraud. Who will be responsible for lost funds in the case of fraud? One of the presumed advantages of E-CNY is that the PBOC can not only remunerate victims of fraud rather inexpensively, but also undo the fraudulent transaction, thus depriving the fraudster of their illicit gains and having greater insight into who committed the fraud. At this point, there currently is not an explicit policy in place.

Lastly, E-CNY has the potential to change the nature of taxation in the future. As a digital currency becomes more widespread, the government will theoretically have more information about how its citizens make and spend money. This will likely change the nature of tax evasion and tax investigations. It might also be able to collect taxes more directly with the use of smart contracts, rather than relying on individual actors to be honest and forthcoming about their tax obligations. But the change would require tax authorities to obtain access to the PBOC’s database regarding E-CNY activities. It is too early to tell how this would occur and what procedures would need to be followed.

VI. Conclusion

¹⁰⁰ Zhonghua Renmin Gongheguo Renmin Yinhangfa (Xiuding Caoan Zhengqiu Yijiangao) (中华人民共和国中国人民银行法 (修订草案征求意见稿)) [the Law of the PRC on the People’s Bank of China (Revised Draft for Comments)] http://www.gov.cn/zhengce/zhengceku/2020-10/24/content_5553847.htm article 19

E-CNY is China's pioneering effort to deploy a digital currency. While other countries have also started to deploy digital currencies, the size of China's economy and the potential future scope of E-CNY indicate that the initial deployment of E-CNY could mark the beginning of a turning point for digital currencies globally. It would be wise for other sovereign central banks interested in digital currencies across the world to pay close attention to the development of E-CNY. One way or another, it will likely be impactful, both for China domestically but for the international community as well.

On that note, this report has taken a close look at China's potential motivations and goals for issuing E-CNY. At this stage, the PBOC has a domestic agenda with a focus on solving domestic financial and social concerns. Accordingly, the potential impacts of E-CNY, at least initially, are more likely domestic. The PBOC would have greater control over citizens' economic and financial activities with a clear E-CNY record. The broader deployment of E-CNY would directly affect the duopoly of Alipay and WeChat Pay. The role of commercial banks and other intermediaries will likely remain significant, though some changes are expected. The major challenges surrounding the development and deployment of E-CNY are related to the access to and use of data, due process rights, and privacy protections. Additionally, some legal questions, such as money laundering, fraud, taxation, and antitrust, remain unclear and need further attention. As described above, there remain many unanswered questions regarding the technical infrastructure of the E-CNY, including but not limited to how different it really is from existing digital money. Is the only key difference the increasingly prominent role of the PBOC, and the Chinese government more generally, in the financial system? The general lack of transparency raises more questions than it answers, and suggests that the Chinese government has many reasons for hiding key details about how E-CNY works, both for reasons of security as well as obfuscating potentially unpopular motives.

Going forward, the PBOC and other entities will likely articulate new rules and understandings regarding how E-CNY and the various institutions involved in its deployment should operate. It will be important for policymakers, research scholars and other interested parties to pay close attention to these developments from now on.