

Existential Threat or Digital Yawn: Evaluating China's Central Bank Digital Currency

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ABSTRACT: China is one of the first governments to rein in virtual currencies while also working to consider how a central bank digital currency (“CBDC”) could advance its policy goals. This Note evaluates the impact of China’s CBDC—the e-CNY—on the United States and on the international financial system by framing it within China’s broader domestic policy initiatives. Although China certainly hopes to reduce reliance on the U.S.-dominated international financial infrastructure in the decades ahead, it is also driven by important domestic policy priorities—namely, cracking down on financial crime and illegal gambling, reasserting control over outbound capital flows, and addressing an increasingly concentrated market of powerful private sector payment platforms. Financial and political implications follow for the U.S. sanctions regime, as well as U.S. dollar dominance, the global balance of economic power, and the ability of an increasingly authoritarian regime to monitor and control its society. However, the introduction of a new financial technology is but one factor among many others, and any gains from the adoption of the e-CNY that China may enjoy relative to the United States may be marginal.

INTRODUCTION

China is one of the first governments to regulate virtual currencies while also working to consider how a central bank digital currency (“CBDC”) could advance its policy goals—projects that governments elsewhere are just now beginning to consider.¹ Policymakers in Washington D.C. and in Brussels have been troubled by the speed with which China has rolled out plans

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1. See James T. Areddy, *China Creates Its Own Digital Currency, a First for Major Economy*, WALL ST. J. (Apr. 5, 2021), <https://www.wsj.com/articles/china-creates-its-own-digital-currency-a-first-for-major-economy-11617634118> [https://perma.cc/2HW8-MN87]; Nathaniel Popper & Cao Li, *China Charges Ahead With a National Digital Currency*, N.Y. TIMES (Mar. 5, 2021), <https://www.nytimes.com/2021/03/01/technology/china-national-digital-currency.html> [https://perma.cc/HK23-77EV]. The e-CNY has been on display in the most recent Winter Olympics in Beijing as the sole exception to the exclusivity granted to Visa as the official payment system of the Olympics. See Jing Yang & AnnaMaria Andriotis, *At the Winter Olympics, Beijing’s Digital Yuan Push Puts Visa in a Bind*, WALL ST. J. (Feb. 9, 2022), <https://www.wsj.com/articles/beijings-digital-currency-push-at-winter-olympics-puts-visa-in-a-bind-11644402602> [https://perma.cc/N6E4-QZ29] (noting that the e-CNY does not constitute a conflict with Visa’s exclusive agreement because the e-CNY is legal tender, although the “e-CNY’s debut inside the Beijing Olympic bubble has failed to resonate with visitors from outside the country.”). In comparison, the U.S. Federal Reserve has only recently released a discussion paper examining the pros and cons of a potential U.S. CBDC. BD. OF GOVERNORS OF THE FED. RESRV. SYS., MONEY AND PAYMENTS: THE U.S. DOLLAR IN THE AGE OF DIGITAL TRANSFORMATION (2022).

for its CBDC, referred to as the e-CNY, and are especially concerned by the possibilities such a technology could have in the hands of an increasingly authoritarian regime. This Note evaluates the impact of the e-CNY on the United States and on the international financial system by considering China's broader domestic policy initiatives.

Although CBDCs generally have received some attention from legal scholars,² the e-CNY specifically has received much less attention.³ Rather, the bulk of discussion surrounding CBDCs comes from professional organizations like the Bank for International Settlements ("BIS"),⁴ various Central Banks,⁵ as well as think tanks⁶ and media outlets. While some of the litera-

2. See, e.g., John Crawford et al., *FedAccounts: Digital Dollars*, 89 GEO. WASH. L. REV. 113 (2021) (arguing for the expansion of access to accounts at the Federal Reserve); Anton N. Didenko & Ross P. Buckley, *The Evolution of Currency: Cash to Cryptos to Sovereign Digital Currencies*, 42 FORDHAM INT'L L.J. 1041 (2019) (discussing the various forms a sovereign digital currency could take); Jack Solowey, *Digital Delegation Doctrine: Central Bank Digital Currencies and the Future of the Separation of Powers*, 12 N.Y.U. J. L. & LIBERTY 874, 876 (2019) ("[A] public digital currency would provide an opportunity to allay agency delegation and trust problems within the government. Specifically, a public digital currency could provide a new platform for addressing the separation of powers issues presented by congressional delegations of authority to administrative agencies and presidential control of agency officers.").

3. Two exceptions are worth noting. One article thoroughly discusses the challenge the e-CNY presents to the enforcement of international trade law. See Harrison Dent, *International Trade Law Concerns with China's Digital Currency: How Sovereign-Issued Stablecoin Can Destabilize International Trade*, 51 GEO. J. INT'L L. 919, 919 (2020) (arguing that the e-CNY "will grant China unprecedented trade leverage and, if China chooses, help the [government of China] conceal actionable subsidies and manipulate its currency exchange."). Although notable for its thorough discussion of trade law, it was written before the more authoritative information was available on the e-CNY, and thus describes it as a stablecoin backed by the RMB. *Id.* at 924. In actuality, the e-CNY will itself function as fiat currency alongside the RMB. See *infra* Section II.B. A second article takes a similar approach to this Note and evaluates the potential threats posed to the United States by a Chinese CBDC. See Joel Slawotsky, *US Financial Hegemony: The Digital Yuan and Risks of Dollar De-Weaponization*, 44 FORDHAM INT'L L.J. 39 (2020) (examining the expansion of the digital yuan as it relates to the Bretton-Woods system). However, this article does not discuss the exact design parameters of the e-CNY, and instead suggests that "supreme confidence in the USD's hegemonic encasement is misplaced." *Id.* at 45. While this Note is not supremely confident in the hegemony of the U.S. dollar, it is ultimately more skeptical of the impact that the e-CNY will have on the international financial system.

4. See, e.g., Raphael Auer & Rainer Böhme, *The Technology of Retail Central Bank Digital Currency*, BIS Q. REV. (Mar. 2020); BANK OF INT'L SETTLEMENTS, BIS ANNUAL ECONOMIC REPORT 2021; BANK OF INT'L SETTLEMENTS, CENTRAL BANK DIGITAL CURRENCIES: FINANCIAL STABILITY IMPLICATIONS (2021).

5. See, e.g., John Barrdear & Michael Kumhof, *The Macroeconomics of Central Bank Issued Digital Currencies* (Bank of England Working Paper No. 605, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2811208 [<https://perma.cc/E73H-YVKM>]; Ulrich Bindseil, *Central Bank Digital Currency – Financial System Implications and Control*, EUR. CENTRAL BANK (2019), <https://ssrn.com/abstract=3385283> [<https://perma.cc/T5US-WFSB>]; Jonathan Chiu et al., *Bank Market Power and Central Bank Digital Currency: Theory and Quantitative Assessment*, BANK OF CANADA (Mar. 28, 2021), <https://ssrn.com/abstract=3331135> [<https://perma.cc/4TQH-N5NM>]; Young Sik Kim & Ohik Kwon, *Central Bank Digital Currency and Financial Stability* (Bank of Korea Working Paper 2019-6, 2019), <https://ssrn.com/abstract=3330914> [<https://perma.cc/779J-ZBLR>].

6. See, e.g., Robert Greene, *Beijing's Global Ambitions for Central Bank Digital Currencies Are Growing Clearer*, CARNEGIE ENDOWMENT FOR INT'L PEACE (Oct. 6, 2021), <https://carnegieendowment.org/2021/10/06/beijing-s-global-ambitions-for-central-bank-digital-currencies-are-growing-clearer-pub-85503> [<https://perma.cc/G7DC-X8CW>]; Rajesh Bansal & Somya Singh, *China's Digital Yuan: An Alternative to the Dollar-Dominated Financial System*, CARNEGIE INDIA (Aug. 31, 2021), <https://carnegieindia.org/2021/08/31/china-s-digital-yuan-alternative-to-dollar-dominated-financial-system-pub-85203> [<https://perma.cc/8520-31CH>].

ture analyzes CBDCs or the e-CNY from a political perspective, many of these works focus more on the technology of a CBDC.⁷ This Note will contribute to the literature in two ways. It will highlight both the known and the still unknown design aspects of the e-CNY as evidenced from a recently-released—though not widely discussed—White Paper issued by the People’s Bank of China (“PBOC”). While existing popular commentary discusses the e-CNY based on disparate and sometimes conflicting statements from various Chinese policymakers, few have evaluated this more official White Paper issued by the policy-setting authority.⁸ Second, it situates the e-CNY within China’s broader domestic policy initiatives, adding important context to the discussions of China’s motivations. Specifically, the history of China’s prohibition on virtual currencies and its increasingly punitive regulation of private payment platforms like Ant Group’s Alipay indicate that while China has important international motivations, and certainly hopes to reduce reliance on the U.S.-dominated international financial infrastructure in the decades ahead, it is also driven by important domestic policy priorities.⁹ Namely, China’s policymakers also aim to crack down on financial crime and illegal gambling, reassert control over outbound capital flows, and address an increasingly concentrated market of private sector payments platforms.

These domestic priorities provide context for the international significance of the e-CNY. At a minimum, they show that officials at the PBOC are motivated by concerns not that different from those currently motivating officials in the United States: financial stability, consumer protection, and Anti-Money Laundering and Counter Terrorism Financing (“AML/CTF”) are fairly standard core concerns of any financial regulator.¹⁰ These run-of-the-mill regulatory motivations, and their alignment with similar actions in the United States, are not often emphasized, but should serve as an important moderating signal for U.S. policymakers.

perma.cc/LB2S-P6K9]; Anton N. Didenko et al., *After Libra, Digital Yuan and COVID-19: Central Bank Digital Currencies and the New World of Money and Payment Systems* (European Banking Institute Working Paper Series 65/2020, 2021), <https://ssrn.com/abstract=3622311> [<https://perma.cc/7LK6-SGJ8>].

7. Much of BIS’s work is of this nature. See, e.g., Auer & Böhme, *supra* note 4.

8. See Martin Chorzempa, *China, the United States, and Central Bank Digital Currencies: How Important Is It to Be First?*, 14 CHINA ECON. J. 102, 103 (2021) (“What is publicly known about [the e-CNY] at this point relies heavily on remarks from a variety of PBOC officials in interviews with Chinese media or speeches reported by such media. The piecemeal nature of this communication, compared to, for example, a comprehensive white paper, makes it difficult to assess the extent of remaining work to be done.”); see also Dent, *supra* note 3; Slawotsky, *supra* note 3.

9. See *infra* Part III.

10. See, e.g., Jennifer Epstein et al., *White House Is Set to Put Itself at Center of U.S. Crypto Policy*, BLOOMBERG (Jan. 21, 2022), <https://www.bloomberg.com/news/articles/2022-01-21/white-house-is-set-to-put-itself-at-center-of-u-s-crypto-policy> [<https://perma.cc/J6KS-VPD7>]; Mengqi Sun, *DeFi Increasingly Popular Tool for Laundering Money, Study Finds*, WALL ST. J. (Jan. 26, 2022), <https://www.wsj.com/articles/defi-increasingly-popular-tool-for-laundering-money-study-finds-11643202002#> [<https://perma.cc/WC6D-39DX>]; Sara Fischer & Margaret Harding McGill, *Crypto Leads to Massive Surge in Online Scams*, AXIOS (Jan. 30, 2022), <https://www.axios.com/crypto-scam-ftc-2079c3b2-6237-4ff8-92f2-d08382cd0d70.html> [<https://perma.cc/8G9H-YR78>].

This is not to say that China's motivations in implementing a CBDC are purely domestic. China's leaders are, of course, quite concerned with their nation's position in the world,¹¹ and much of their technological innovation policies are explicitly motivated by a desire to attain control over cutting-edge technology in order to lead globally.¹² As such, the domestic policy context is imperative to understanding the international significance of the e-CNY. China has long desired to distance itself from U.S.-led financial networks, and this desire highlights the most acute concern for U.S. policy-makers: the impact that an internationally interoperable e-CNY could have on the efficacy of the U.S. sanctions regime.¹³ Should the e-CNY serve as the basis for a viable and widely-adopted alternative to the current system, it could severely reduce the efficacy of sanctions. This issue is starkly underscored by the "no limits" partnership between China and Russia,¹⁴ especially amid widespread condemnation of Russia's invasion of Ukraine, expressed largely through economic sanctions as of this writing. Among these, one of the most notable is the barring of several Russian banks from international payments networks.¹⁵ This said, the viability of an e-CNY-based alternative to the Society for Worldwide Interbank Financial Telecommunication ("SWIFT") is still highly speculative, and the U.S. economy and financial system remain attractive enough that the alternatives will be poor substitutes.¹⁶

Beyond core national security concerns, the e-CNY could prove to be a revolutionary tool for international payments. Even U.S. allies are frustrated by the onerous compliance demands of U.S. sanctions, and an alternative

11. The aphorism "hide your capabilities, bide your time" ("韬光养晦") is said to have been a guiding force for Chinese foreign policy for much of the last 40 years—first develop strong domestic capabilities, then turn outward. This strategy was intended to give China "space to develop." President Xi Jinping has turned away from this policy, and instead placed greater emphasis on a project of "national rejuvenation," which also has historical roots. See Rush Doshi, *Hu's to Blame for China's Foreign Assertiveness?*, BROOKINGS (Jan. 22, 2019), <https://www.brookings.edu/articles/hus-to-blame-for-chinas-foreign-assertiveness/> [https://perma.cc/BM6S-TKRC] ("China's leaders have been explicit in open sources that they never expected Tao Guang Yang Hui to be permanent. Deng, Jiang, and Hu's own speeches all conceded that adherence to the strategy was based on China's assessment of the "international balance of power" [国际力量对比] and (implicitly) that it would therefore one day expire."); see also Tarun Chhabra & Ryan Hass, *Global China: Domestic Politics and Foreign Policy*, BROOKINGS (Sept. 2019), <https://www.brookings.edu/research/global-china-domestic-politics-and-foreign-policy/> [https://perma.cc/7QPR-T3N2].

12. See *infra* text accompanying notes 80–81.

13. See *infra* Section IV.A.

14. See Edward Wong & Julian E. Barnes, *China Asked Russia to Delay Ukraine War Until After Olympics*, U.S. *Officials Say*, N.Y. TIMES (Mar. 2, 2022), <https://www.nytimes.com/2022/03/02/us/politics/russia-ukraine-china.html> [https://perma.cc/AE4P-ZX7S] ("Moscow and Beijing issued a 5,000-word statement at the time declaring that their partnership had 'no limits,' denouncing NATO enlargement and asserting that they would establish a new global order with true 'democracy.'").

15. See Saleha Mohsin et al., *West Cuts Some Russian Banks from SWIFT, Sanctions Central Bank*, BLOOMBERG (Feb. 26, 2022, 9:03AM), <https://www.bloomberg.com/news/articles/2022-02-26/u-s-weighs-sanctions-on-russia-s-central-bank-over-ukraine> [https://perma.cc/T4BK-X5YL]; see also *infra* text accompanying notes 142, 145.

16. See *infra* Section IV.A.

international payment mechanism that is more modern and efficient than SWIFT could attract users. Moreover, even if not widely adopted internationally, a more limited intra-regional payment network based on the e-CNY could prove to be a useful tool for consolidating Chinese dominance in regional trade areas, especially in areas implicated in the Belt and Road initiative.¹⁷ These international potentialities aside, the e-CNY could prove to be a revolutionary tool for macroeconomic management domestically, allowing for real-time monitoring and precise economic stimulus.¹⁸ This aspect of the technology is also speculative, but even marginal success could help to improve economic performance. Should it prove to be effective, the Chinese economy could conceivably prove to be more attractive than the U.S. economy, perhaps displacing the U.S. dollar as the global reserve currency.¹⁹

Ultimately, although U.S. regulators are not wrong to be wary of the geopolitical implications of a new Chinese CBDC, their assessment of the risks should be informed by the entirety of the domestic Chinese policy context. Failure to do so puts the United States at risk of overcorrecting and taking a more aggressive response than may be warranted, leading to further deterioration in the U.S.-China relationship. A Chinese-led system of CBDCs may present a challenge to the United States if it proves to be a viable and attractive alternative to the current international financial system, and especially if this alternative removes economic sanctions as an effective tool of U.S. foreign policy. However, financial technology is but one consideration among many, and any gains may be marginal. Politics and ideology remain important determinants of the global balance of power. That said, multiple gains of marginal significance add up: faster trains,²⁰ better payment systems,²¹ or earlier adoption of advanced telecommunications technology²² each, on their own, may not challenge the United States. But, taken together, these marginal gains do begin to impact the project of U.S. power abroad. The United States and its allies should prioritize the modernization of cross-border payment systems so that the U.S.-led international financial system remains the competitive alternative to any Chinese-led system.

17. See *infra* Section IV.B.

18. See *infra* Section IV.C.

19. See *infra* Section IV.B.

20. See Andrew Browne, *Bloomberg New Economy: Biden's Infrastructure Plan May Reshape U.S.-China Competition*, BLOOMBERG (Apr. 3, 2021), <https://www.bloomberg.com/news/newsletters/2021-04-03/bloomberg-new-economy-biden-s-infrastructure-plan-may-reshape-u-s-china-competition> [https://perma.cc/A2GA-UC9R].

21. See Jennifer Surane & Christopher Cannon, *Why China's Payment Apps Give U.S. Bankers Nightmares*, BLOOMBERG (May 23, 2018), <https://www.bloomberg.com/graphics/2018-payment-systems-china-usa/> [https://perma.cc/R46A-8YCL].

22. See David Sacks, *China's Huawei is Winning the 5G Race. Here's What the United States Should Do to Respond*, COUNCIL ON FOREIGN REL. (Mar. 29, 2021), <https://www.cfr.org/blog/china-huawei-5g> [https://perma.cc/L9X4-9A8H].

This Note proceeds in four parts. Part I provides an introduction to CBDCs, defining them and examining potential design parameters. Part II uses these parameters to understand the design of the e-CNY, as described in the recent and authoritative PBOC White Paper. Part III evaluates recent Chinese regulatory actions that provide important context for interpreting the overall importance of the e-CNY. Namely, it reviews the history of China's regulatory crackdown on private cryptocurrencies, and its enhanced regulatory scrutiny of the private mobile payments space—notably, the rise and fall of Jack Ma's Ant Group. With this domestic context in mind, Part IV evaluates the implications of the e-CNY for the international status quo. Four concerns are particularly prominent. First, the e-CNY may provide China with the ability to bypass U.S.-controlled cross-border payment networks, weakening the U.S. economic sanctions regime at the same time China has introduced a blocking statute and its own sanctions regime as countermeasures. Second, the e-CNY may displace the U.S. dollar as the dominant global currency. Third, the e-CNY may prove to be a revolutionary tool for macroeconomic policy management and could alter the global balance of economic power. Last, and certainly not least, the e-CNY may represent a troubling new tool for societal control by an increasingly authoritarian regime.

I. BACKGROUND

A. *Defining CBDC*

When thinking about central bank money, one might first think of large stacks of gold or cash—stored in Fort Knox, perhaps. CBDCs, alternatively, might bring something like Bitcoin to mind. Neither conception of money is entirely accurate.

The modern banking system is made up of three different types of money. National central banks administer two of them: fiat currency (often in the form of paper currency, like the Federal Reserve Notes—or Dollar bills—in a wallet), and banking reserves held by major financial institutions. Both are direct liabilities on the central bank's balance sheet. Commercial bank money, or private money, is the third type, and is comprised of deposits at a depository institution—the balance of one's bank account, for example. Commercial bank money constitutes a liability of the commercial bank, not the central bank.²³ The central bank and commercial bank monetary systems support each other. Commercial banks use central bank money to settle interbank transfers; central banks facilitate convertibility between the two

23. Deposit insurance may blur the distinction somewhat between central bank money and commercial bank money, as it guarantees the safety of many deposit accounts. However, such insurance is neither unlimited nor universal: in the United States, for example, the Federal Deposit Insurance Corporation ("FDIC") only insures accounts up to \$250,000, and only 56.8 percent of the \$15.7 trillion USD worth of deposits in the country are insured. *See* ANNUAL REPORT 2020, FED. DEPOSIT INS. CORP. 138 (2021).

types of money by providing banknotes; and the central bank often functions as a lender of last resort, helping to solve the problem of bank runs inherent in the provision of private money.²⁴

Traditionally, central banks held their assets in large stacks of gold—as in Fort Knox—or in physical cash; commercial banks, too, held some physical assets in their vaults, beyond their reserves at the central bank.²⁵ In the digital age, however, hardly any of these types of money are held as stacks of gold or physical cash—they are nearly all digital. To settle interbank transfers, for example, the Federal Reserve simply adjusts the figures in each bank’s digital account. When a commercial bank issues a loan, or receives a deposit, it simply updates its digital ledger.

CBDCs, then, are the next iteration of this system. The Bank of International Settlements defines a CBDC as a “digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank,” albeit one that is “different from balances in traditional reserve or settlement accounts.”²⁶ This definition allows for either a wholesale conception of a CBDC—accessible only by financial institutions with accounts at the central bank, much like the current system of digital central bank money—or a retail conception—one where the CBDC is essentially analogous to a digital form of paper money. The U.S. Federal Reserve tracks this latter definition, defining a CBDC as “a digital liability of a central bank that is widely available to the general public.”²⁷ Exactly what a CBDC is and how it functions will depend on how it is designed and employed.

Note, however, an important difference between this definition of CBDCs and popular digital currencies like Bitcoin: whereas CBDCs are a liability of a central bank, cryptocurrencies are not a liability on any institution’s books.²⁸ Certain types of digital currencies, like stablecoins, may be backed by a basket of official currencies, although even these would be subject to

24. *Central Bank Digital Currencies: Foundational Principles and Core Features*, BANK FOR INT’L SETTLEMENTS 4 (2020) [hereinafter BIS REPORT].

25. See generally Craig K. Elwell, *Brief History of the Gold Standard in the United States*, CONG. RSCH. SERV. (June 23, 2011). Although the Gold Reserve Act of 1934 required the Federal Reserve to transfer all of its gold to the Treasury Department, the Federal Reserve still acts as a custodian for gold owned by the United States and other foreign governments, central banks, and other international organizations. See FAQs, BD. OF GOVERNORS OF THE FED. RSRV. SYS. (Dec. 3, 2014), <https://www.federalreserve.gov/faqs/does-the-federal-reserve-own-or-hold-gold.htm> [<https://perma.cc/A3SY-RZ8P>]; *Gold Vault*, FED. RSRV. BANK OF N.Y., <https://www.newyorkfed.org/aboutthefed/goldvault.html> [<https://perma.cc/8AZ7-KG9F>] (last visited Mar. 17, 2022).

26. BIS REPORT, *supra* note 24, at 3.

27. BD. OF GOVERNORS OF THE FED. RSRV. SYS., *supra* note 1.

28. Indeed, cryptocurrency enthusiasts often highly value the lack of a centralized administering authority, preferring the consensus-based mechanisms offered by distributed-ledger technology. See *CBDC vs Cryptocurrency: What Are the Core Differences?*, SHRIMPY ACAD. (May 20, 2021), <https://academy.shrimpy.io/post/cbdc-vs-cryptocurrency-what-are-the-core-differences> [<https://perma.cc/NKP2-QFCA>] (“Central bank digital currencies are simply a bad copy of the crypto assets that we use today. They only impose restrictions and limitations, rarely bringing anything to the table that might enchant someone and push them away from decentralized currencies . . . will anyone willingly give away their freedom for the sake of faster transactions?”).

fluctuations in market value.²⁹ Because CBDCs are issued and maintained by a central bank, they would function as cash equivalents.³⁰

B. Designing CBDCs

While existing digital central bank money is generally wholesale—the digital accounts of commercial banks with accounts at the central bank—popular discussion of CBDCs has focused on their retail applications for consumers.³¹ A retail CBDC can be designed around three different parameters: architecture, infrastructure, and access.³² Additionally, a CBDC can also be designed to bear interest (or not, or potentially even bear negative interest), and can be designed with quantitative limits.³³ Finally, CBDCs may be interoperable across international borders. These elements are explained in turn.

1. Architecture – Direct or Indirect

The architecture of a CBDC can be either direct or indirect.³⁴ Under the direct model, the central bank holds the consumer's account and provides all of the payment services related to the use of the CBDC. Although the direct

29. See Christian Catalini & Jai Massari, *Stablecoins and the Future of Money*, HARV. BUS. REV. (Aug. 10, 2021), <https://hbr.org/2021/08/stablecoins-and-the-future-of-money> [<https://perma.cc/6L9T-EX7L>] (“[T]here’s a real risk stablecoins would be anything but stable. They could collapse like an unsound currency board, ‘break the buck’ like money market funds in 2008, or spiral into worthlessness. They could replicate the turmoil of the ‘wildcat’ banks of the 19th century.”).

30. Other design differences are noted *infra* Section I.B. Note that the design described in Dent, *supra* note 3, actually characterizes the e-CNY as a stablecoin backed by the RMB, though this account was based on information prior to the release of the PBOC White Paper.

31. For an example of discussion regarding the wholesale applications of a CBDC, see BANK OF INT’L SETTLEMENTS *supra* note 4, at 70 (“Wholesale CBDCs are for use by regulated financial institutions . . . The central bank grants accounts to commercial banks . . . and domestic payments are settled on the central bank’s balance sheet. Wholesale CBDCs are intended for the settlement of interbank transfers and related wholesale transactions.”).

32. These terms generally track those used by international organizations like the Bank of International Settlements in discussing the design of CBDCs. See Auer & Böhme, *supra* note 4. However, the Federal Reserve, in its recently-released White Paper on CBDC design, notes that “CBDC design choices are more granular than commonly assumed,” and that it “found these limited categorizations lacking and insufficient to surface the complexity of choices in access, intermediation, institutional roles, and data retention in CBDC design.” PROJECT HAMILTON PHASE 1: A HIGH PERFORMANCE PAYMENT PROCESSING SYSTEM DESIGNED FOR CENTRAL BANK DIGITAL CURRENCIES, FEDERAL RESERVE BANK OF BOSTON AND MASS. INST. OF TECH. DIGIT. CURRENCY INITIATIVE 5 (2022) [hereinafter PROJECT HAMILTON]. Instead, the Fed identifies steps like “creation, authorization, submission, execution, and storing history” that will allow “CBDC designers [to] consider the potential roles for intermediaries at each stage, creating opportunities for innovation.” *Id.* The Fed’s points are well taken, but because the PBOC White Paper utilizes the terms architecture, infrastructure, and access, this Note will proceed with these three terms.

33. Although these two functionalities are not core to a discussion of CBDC design, they are directly related to how a CBDC would impact the existing financial system, as well as concerns of financial disintermediation and stability, and are thus included in this paper. See generally BANK OF INT’L SETTLEMENTS, CENTRAL BANK DIGITAL CURRENCIES: FINANCIAL STABILITY IMPLICATIONS (2021) (discussing the variety of implications on commercial bank deposit rates by CBDC interest rates).

34. See Auer & Böhme, *supra* note 4, at 88.

model would potentially increase access to financial services,³⁵ it would require the central bank to undertake all of the functions currently managed by financial intermediaries—including account services, oversight related to anti-money laundering (“AML”) and Know-Your-Customer (“KYC”) requirements, transaction verification, dispute resolution, and various information technology requirements.³⁶ Properly undertaking such responsibilities would require a central bank to significantly increase its workforce—commentators estimate that the 17 largest banks in the United States employ more than 14,000 people in AML/KYC alone.³⁷ Furthermore, under the direct model, financial intermediaries would not only lose access to consumer deposits—an important element in funding credit markets—but would also lose access to consumer data provided by processing transactions, thereby undercutting FinTech firms that rely on processing and monetizing such data.³⁸ Additionally, a direct model risks creating an attractive target for cyberattacks.³⁹ These factors have led many central bankers to disfavor a direct model.⁴⁰

The indirect model, sometimes referred to as a “two-tier” model, bears closer resemblance to the current monetary system and appears to be the basis for many CBDC pilots.⁴¹ Under this approach, individuals hold CBDCs in a “digital wallet” managed by a financial intermediary acting as an agent of the central bank. The central bank merely tracks the wholesale CBDCs balances of the intermediaries, updating those balances as transactions are made, much like the current payment and settlement system. The intermediary will provide all of the retail deposit and payment services, relieving the central bank of that burden. However, because the CBDC is a liability on the central bank’s balance sheet rather than the intermediary’s

35. See, e.g., Jesse Leigh Maniff, INCLUSION BY DESIGN: CREATING A CENTRAL BANK DIGITAL CURRENCY TO REACH ALL AMERICANS, FED. RESRV. BANK OF KANSAS CITY 1 (2020) (“Encouraging financial inclusion is one potential motivation for issuing a CBDC.”).

36. See Gregory Baer, *Central Bank Digital Currencies: Costs, Benefits and Major Implications for the U.S. Economic System*, BANK POL. INST. 4 (2021).

37. *Id.*

38. *Id.* at 5.

39. American Bankers Association, Statement before the Subcommittee on Economic Policy of the Committee on Banking, Housing, and Urban Affairs 5 (June 9, 2021) (citing Lael Brainard, Remarks at the Decoding Digital Currency Conference, *Cryptocurrencies, Digital Currencies, and Distributed Ledger Technologies: What Are We Learning* (May 15, 2018), <https://www.federalreserve.gov/newsevents/speech/files/brainard20180515a.pdf> [<https://perma.cc/W4ZR-8VNW>]).

40. *Id.* (citing Fabio Panetta, *Evolution or Revolution? The Impact of the Digital Euro on the Financial System*, BRUGEL ONLINE SEMINAR (Feb. 10, 2021), <https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210210~a1665d3188.en.html> [<https://perma.cc/N8EW-Z8E4>]); see also American Bankers Association, *supra* note 39, at 7 (“[A direct model would] present an immense operational burden on the central bank, which would be responsible for onboarding customers and servicing those accounts.”).

41. The Eastern Caribbean Central Bank (“ECCB”), one of the first authorities to implement a live CBDC pilot, has adopted an indirect approach. See CODRUTA BOAR ET AL., IMPENDING ARRIVAL—A SEQUEL TO THE SURVEY ON CENTRAL BANK DIGITAL CURRENCY 10, BANK FOR INT’L SETTLEMENTS (2020). China, as will be seen shortly, has also decided to adopt a “two-tier” system.

balance sheet, the intermediary will be unable to leverage the CBDC balances to fund loans in the same way it uses traditional deposits.⁴²

2. *Infrastructure – Centralized or Distributed*

The infrastructure of a CBDC is the ledger upon which the central bank's liabilities are recorded. The ledger can be either centralized or distributed. A centralized model would operate similarly to present-day central bank systems; under this approach, the central bank manages the ledger, keeping track of account holders' balances as transactions are made.⁴³ Alternatively, distributed ledger technology ("DLT") provides a system whereby transactions are verified and the ledger is maintained by the users themselves, as is the case with most cryptocurrencies,⁴⁴ rather than by a single trusted authority. The distinction between a centralized and a decentralized CBDC is important because it highlights that, although CBDCs are often discussed in the same breath as cryptocurrencies, a CBDC need not be a cryptocurrency.⁴⁵

A CBDC could fall in between the two extremes of completely centralized or decentralized. For example, a completely decentralized CBDC system could involve a *permissionless* DLT system like Bitcoin, where a very wide range of users could participate in validating transactions.⁴⁶ Alternatively, a partially centralized system might involve a *permissioned* system whereby only certain trusted participants like financial intermediaries can participate.⁴⁷ A CBDC with indirect architecture could conceivably apply a

42. Some commentators question why a bank would willingly undertake the cost of managing these accounts if deprived of this traditional source of revenue; at a minimum, the bank would need to impose account fees, which might undercut some of the financial inclusion arguments in favor of a CBDC. See Baer, *supra* note 36, at 5.

43. *Id.*

44. See MICHAEL S. BARR ET AL., FINANCIAL REGULATION: LAW AND POLICY 873 (3d ed. 2021). Note that although all blockchain technologies are distributed ledgers, not all distributed ledgers are blockchains. See *Difference Blockchain and DLT*, MARCO POLO NETWORK (Mar. 1, 2018), <https://www.marcopolonetwork.com/articles/distributed-ledger-technology/> [<https://perma.cc/ES4S-PVYM>].

45. Antonio Douglas & Alison Schonberg, *Digital Yuan Rollout Raises Privacy and Oversight Concerns*, US-CHINA BUS. COUNCIL (June 17, 2021), https://www.uschina.org/sites/default/files/digital_yuan_rollout_raises_privacy_and_oversight_concerns.pdf [<https://perma.cc/4XGA-BMA6>].

46. Indeed, there is some tension in categorizing a permissionless, centralized money as a *central* bank digital currency, and it is unlikely central banks would choose such a design in part because of the storage and processing requirements. See Auer & Böhme, *supra* note 4, at 92 n.15 ("Most likely, central banks would consider only 'permissioned' DLT, in which a network of preselected entities performs the updating. While it is technically possible to use 'permissionless' technology, in which unknown validators perform the updating, the economic cost of this process is very high"); ANNUAL ECONOMIC REPORT, BANK FOR INT'L SETTLEMENTS 100 (2018) (describing the scalability issues that "limit[] cryptocurrencies' usefulness for day-to-day transactions. . . [as] the more people use a cryptocurrency, the more cumbersome payments become."). Alternatively, if coupled with a two-tier system, a CBDC could conceivably employ a "sidechain"—a secondary blockchain attached to the primary blockchain that allows for information to be transferred between chains when necessary—with the central bank operating the primary blockchain, and authorized financial institutions operating on their own related sidechains. See generally Adam Back et al., *Enabling Blockchain Innovations with Pegged Sidechains*, BLOCKSTREAM (2014).

47. See ANNUAL ECONOMIC REPORT, *supra* note 46, at 96.

permitted DLT system, allowing for the settlement of transactions between a limited number of financial intermediaries.

3. *Access – Tokens or Accounts*

Finally, access to a CBDC can be either token-based or account-based. A token-based system is closest to “digital cash,” in that it would be a bearer instrument and could be transferred with some degree of anonymity, as Bitcoin is currently.⁴⁸ Transactions would depend on the authenticity of the token—avoiding counterfeits—rather than the identity of the holder of the token. However, this token-based system presents two primary flaws. First, it could undermine the existing AML/CFT regimes. While physical cash is completely anonymous, it is also difficult to transfer in large amounts if not converted into commercial bank deposits. Banks thus shoulder the responsibility of monitoring suspicious transactions. Given the potential for anonymity, token-based digital currencies would be much harder to track and would weaken these security systems.⁴⁹ Second, users who lose access to the wallets that hold their digital tokens would potentially be unable to ever access those accounts again.⁵⁰

Alternatively, an account-based system is more similar to commercial bank deposits, where the CBDC is associated with the owner of a particular account and is tracked as it is transferred from one account to the other.⁵¹ This system would not be as anonymous as a token-based approach, but would likely require financial intermediaries of some sort to facilitate transactions, unless the central bank were to undertake such a project.⁵²

Moreover, whether a token- or account-based system is chosen, policy-makers are considering offline access capabilities. Although it may seem somewhat counterintuitive for a virtual currency to function away from a network, systems have been designed that allow for transactions to occur while the parties are temporarily offline. EagleCash, the payment system of the U.S. Armed Forces, has allowed for such offline transactions since 1997—although an internet connection is eventually required.⁵³ The U.S.

48. Baer, *supra* note 36, at 6.

49. As a result, it seems unlikely that a CBDC would adopt a token-based system; or, at a minimum, that any token-based system would be designed to remedy these weaknesses. *See id.* at 7 (citing Tony Richards et al., *RETAIL CENTRAL BANK DIGITAL CURRENCY: DESIGN CONSIDERATIONS, RATIONALES AND IMPLICATIONS*, RSRV. BANK OF AUSTRALIA (2020)).

50. *See generally* Kenny Malone, *Episode 816: Bitcoin Losers*, PLANET MONEY (Jan. 5, 2018), <https://www.npr.org/sections/money/2018/01/05/576087864/episode-816-bitcoin-losers> [<https://perma.cc/Y464-CZQ8>].

51. Baer, *supra* note 36, at 7.

52. *Id.*

53. *See EagleCash*, BUREAU OF THE FISCAL SERV., <https://fiscal.treasury.gov/eaglecash/> [<https://perma.cc/7YVD-MNAE>] (“EagleCash does not depend on on-line connectivity to conduct transactions. EagleCash can be used at the remotest sites to provide cash services and allow cardholders access to their account.”). Astoundingly, prior to EagleCash, the Armed Forces shipped pallets of cash to military bases around the world to allow personnel to make transactions. *See* Jay Lindsay, *Put It on the Card: Boston Fed Program Makes Money Easier for the Military*, FED. RSRV. BANK OF BOS. (Nov. 8, 2018), <https://>

Federal Reserve and other central banks have noted that offline payments are an important area of future research,⁵⁴ and China also emphasizes the importance of offline capabilities for the e-CNY.⁵⁵

4. *Interest and Quantitative Limits*

Once a central bank has decided on its CBDC design, there are several other functionality choices to make. For example, physical cash does not bear interest, though a CBDC could be designed to pay, or to charge, interest. A central bank decision to pay interest on its CBDC would influence the rates that commercial banks could pay on their deposits. If the CBDC were to pay greater interest than that offered by commercial banks, deposits would likely flow away from commercial banks into the CBDC; banks could attempt to compete with the CBDC interest rate by offering slightly higher interest rates, as well. Whatever the interest rate charged, the existence of a CBDC creates a new outlet for bank runs during times of economic crisis, as depositors and investors seek liquidity and safety rather than interest rates. In times of crisis, depositors once raced to the bank to withdraw their deposits into cash; a CBDC would allow them to withdraw their deposits into the CBDC, without requiring them to find a wheelbarrow in which to transport their pile of cash, or mattresses under which to stash it. This would exacerbate maturity transformation weaknesses already inherent in the commercial bank model, thus requiring commercial banks to adjust their liquidity requirements to hold more high-quality liquid assets against their deposits. These assets would likely displace higher-yielding loans on their balance sheets, thus raising the cost of capital for businesses and consumers.

Two design choices could mitigate the impact of a CBDC on the commercial bank sector, including during times of economic uncertainty. First, the central bank could impose limits on individual holdings of CBDC,⁵⁶ effectively capping the size of the wheelbarrow depositors could use during a bank run. Second, the central bank could establish tiers of interest rates that

www.bostonfed.org/news-and-events/news/2018/svc-article.aspx [https://perma.cc/AZF3-2G8M] (referencing a former Marine's statement that EagleCash "helped him avoid hauling huge amounts of cash in foreign territory" when he "had to run around with a backpack with \$150,000 in it, which makes life kind of edgy.").

54. See PROJECT HAMILTON, *supra* note 32, at 6; Crunchfish, *Crunchfish Goes Global Within CBDC, Having Solved Offline and Private Payments*, PRNEWswire (Apr. 28, 2021), <https://www.prnewswire.com/news-releases/crunchfish-goes-global-within-cbdc-having-solved-offline-and-private-payments-301279216.html> [https://perma.cc/WSK3-E3FM]; see also Mihai Christodorescu et al., *Towards a Two-Tier Hierarchical Infrastructure: An Offline Payment System for Central Bank Digital Currencies*, VISA RSCH. 1 (2020) (proposing "an offline payment system (OPS) protocol for CBDC that allows a user to make digital payments to another user while both users are temporarily offline and unable to connect to payment intermediaries (or even the Internet.)" (emphasis in original). "OPS can be used to instantly complete a transaction involving any form of digital currency over a point-to-point channel without communicating with any payment intermediary, achieving virtually unbounded throughput and real-time transaction latency." *Id.*

55. See *infra* Section II.B.3.

56. Baer, *supra* note 36, at 9; BIS REPORT, *supra* note 24, at 12.

vary depending on the amount of CBDC held.⁵⁷ Both options introduce further complexity for central bankers and for users.⁵⁸

5. *Interoperability*

Many of the central banks exploring CBDCs are also considering their interoperability—not only with other domestic payment networks, but with the CBDCs of other nations.⁵⁹ Although interoperability between CBDCs has been successfully achieved,⁶⁰ the shape of an international regime has yet to be decided. It could take the shape of a hub-and-spoke network, with multiple CBDCs of differing designs converging at a central nexus; or, it could involve a single standard employed in multiple jurisdictions; or, something in between.⁶¹ Whatever the design, it will necessarily involve international consultation on legal and regulatory issues, technological standards, and political considerations.⁶² Several central banks have already begun discussing what such a system might look like, in particular for regional trade areas,⁶³ though talks are in their early stages.⁶⁴

* * *

In sum, a retail CBDC can be either directly managed by the central bank, or indirectly managed via financial intermediaries; its ledger can be either centrally managed by a single authority like the central bank, or it can be distributed among several trusted entities, or among many users; it can be token-based like cash or Bitcoin, or it can be account-based like commercial bank deposits. Further, policymakers also have the option to pay or charge interest on a CBDC. Which design and functionalities are chosen will likely be heavily influenced by the policy considerations driving the adoption of a CBDC in the first place. Moreover, these domestic considera-

57. *Id.*

58. *Id.*

59. See CENTRAL BANK DIGITAL CURRENCIES: SYSTEM DESIGN AND INTEROPERABILITY, BANK OF INT'L SETTLEMENT 9–11 (2021).

60. See Press Release, HSBC and IBM Successfully Design and Test Interoperable Multi-Ledger Central Bank Digital Currency, Securities and Foreign Exchange Settlement Capability (Dec. 16, 2021), <https://newsroom.ibm.com/2021-12-16-HSBC-And-IBM-Successfully-Design-And-Test-Interoperable-Multi-Ledger-Central-Bank-Digital-Currency,-Securities-And-Foreign-Exchange-Settlement-Capability> [<https://perma.cc/P2FU-HMYV>].

61. The scope and design of interoperable CBDCs is beyond the scope of this paper, and a matter of considerable interest. See Gary B. Gorton, *The Orkney Slew and Central Bank Digital Currencies* 26, Working Paper (Oct. 5, 2021), <https://ssrn.com/abstract=3937323> [<https://perma.cc/7MGV-TRUR>]; see also CENTRAL BANK DIGITAL CURRENCIES: SYSTEM DESIGN AND INTEROPERABILITY, *supra* note 59.

62. See generally Gorton, *supra* note 61.

63. See, e.g., Kevin Finch et al., *Caribbean Currency Convertibility in an Era of Central Bank Digital Currency*, CENTRAL BANK OF TRINIDAD & TOBAGO 24 (Sept. 2021); see also *infra* text accompanying note 190.

64. See BIS REPORT, *supra* note 24, at 2 (listing a group of central banks including those of Canada, the European Union, Japan, Sweden, Switzerland, England, and the United States); see also *infra* text accompanying notes 89–90.

tions may be influenced by the extent to which policymakers wish for their CBDC to be interoperable with others.

II. CHINA'S CBDC

This Part introduces what is currently known about the e-CNY. Section A discusses the political and regulatory background leading up to the publication of the PBOC White Paper, which is discussed in Section B. In particular, it summarizes the White Paper to find that e-CNY will employ a two-tiered architecture, will not pay interest, and is ready for cross-border functionality. However, its infrastructure and access features are not yet clear—or, at least publicly available. Part C then discusses the key functionalities of tiered wallets and KYC requirements, as well as programmable contracts.

A. Background

The PBOC was one of the first central banks to take digital currencies seriously—both as a threat, and as an opportunity. China saw privately-created digital currencies as a threat, and the history of China's efforts to prohibit Bitcoin and other cryptocurrencies are almost as old as the technology itself; the first regulatory crackdown occurred in December 2013.⁶⁵ Before the ink had dried on this first prohibitory regulation, PBOC also established a professional study group to study digital currencies.⁶⁶ This study group announced the desire to issue a CBDC in 2016,⁶⁷ which was eventually followed by a large-scale pilot across several major cities in 2019.⁶⁸ In a sign of support from the top, President Xi spoke out in favor of blockchain research, designating it a core technology in late 2019.⁶⁹ In April

65. See *Guanyu Fangfan Bitebi Fengxian de Tongzhi* (关于防范比特币风险的通知) [Notice on Preventing Bitcoin Risks] (Dec. 3, 2012), http://www.gov.cn/gzdt/2013-12/05/content_2542751.htm [<https://perma.cc/B65T-8KKQ>] (prohibiting financial institutions and payment platforms from offering Bitcoin-related services in a rule that was poorly enforced and drafted with several loopholes—including focusing on Bitcoin to the exclusion of other cryptocurrencies; issued by five governmental departments: PBOC, Ministry of Industry and Information Technology, China Banking Regulatory Commission, China Securities Regulatory Commission, China Insurance Regulatory Commission); see also *infra* Section III.A.

66. See *Renmin Yinhang: Jin Yi Bu Mingque Shuzi Huobi Zhanlue Mubiao* (人民银行: 进一步明确数字货币战略目标) [PBOC: Further Clarifying the Strategic Goals for Digital Currency] (Jan. 20, 2016, 8:55 PM), http://www.gov.cn/xinwen/2016-01/20/content_5034826.htm [<https://perma.cc/2WHL-TFSH>] (noting the establishment of the group in 2014).

67. See *id.* It is interesting to note that experts from Citibank and Deloitte were reported as leading discussions at this 2016 study group meeting related to potential frameworks for the issuance of a digital currency, the evolution of national digital currencies as an evolution of currencies, and nationally-issued cryptocurrencies. See *id.*

68. Bansal & Singh, *supra* note 6.

69. See *Xi Jinping Zai Zhongyang Zhengzhibu Di Shibaci Jiti Xuexi Shi Qiangdiao Ba Qukuailian Zuowei Hexin Jishu* (习近平在中央政治局第十八次集体学习时强调把区块链作为核心技术) [Xi Jinping Emphasizes the Importance of Making Blockchain a Core Technology During the 18th Collective Study Session of the Central Politburo], *Xinhua Wang* (新华网) [XINHUA NET] (Oct. 25, 2019, 6:14 PM), http://www.xinhuanet.com/2019-10/25/c_1125153665.htm [<https://perma.cc/78QG-9349>]; see also

2020, PBOC announced that it was expanding pilot programs in preparation for the use of a digital currency at the 2022 Olympics.⁷⁰ Despite the proliferation of study groups, pilot programs, and official statements, the details that emerged about the actual design of China's CBDC were piecemeal and sometimes contradictory.⁷¹ Indeed, as recently as Spring 2021, senior PBOC officials themselves indicated in statements that there was still significant disagreement as to whether it would be central bank liability or a liability on commercial bank balance sheets.⁷²

A PBOC White Paper, issued in July 2021, remedied the piecemeal problem,⁷³ and is notable because it represents the authoritative voice of the government agency tasked with implementing the e-CNY. However, despite its authority, the White Paper does not necessarily provide much additional clarity. The following Sections will analyze the architecture, infrastructure, and access parameters of the China's CBDC (the "e-CNY") as detailed in the PBOC White Paper, as well as key features related to the design of e-CNY wallets.

B. *e-CNY Design*

The e-CNY is the digital form of China's fiat currency, intended to function identically to physical RMB; it will thus be a claim on the central bank, backed by sovereign credit.⁷⁴ It is intended to "mainly serve[] domestic retail payment demands."⁷⁵ Although it adopts a two-tier architecture, its infrastructure and access systems are not yet clear (at least as a matter of public information). Finally, its design is sensitive to the risks of financial disintermediation, and thus will not carry interest, and will be subject to quantitative limits via a tiered-wallet function. The following Sections discuss each of these elements in turn.

William M. Peaster, *Chinese President: Blockchain Will Become "Core" Tech in China*, BLOCKONOMI (Oct. 28, 2020), <https://blockonomi.com/chinese-president-blockchain-will-become-core-tech-in-china/> [<https://perma.cc/3A98-F4KX>].

70. See Chorzempa, *supra* note 8.

71. See *id.* at 105.

72. See Robert Greene, *What Will Be the Impact of China's State-Sponsored Digital Currency?*, CARNEGIE ENDOWMENT FOR INT'L PEACE (July 1, 2021), <https://carnegieendowment.org/2021/07/01/what-will-be-impact-of-china-s-state-sponsored-digital-currency-pub-84868> [<https://perma.cc/5ETF-KZY8>] (highlighting a disagreement between Mu Changchun, Director of the PBOC Digital Currency Research Institute, who claimed that the digital Yuan would be a direct liability on the central bank, and Zhou Xiaochuan, the former PBOC Governor, who claimed that the digital Yuan would be a liability on the balance sheet of issuing institutions, not the central bank).

73. See PROGRESS OF RESEARCH & DEVELOPMENT OF E-CNY IN CHINA, WORKING GROUP ON E-CNY RESEARCH AND DEVELOPMENT OF THE PEOPLE'S BANK OF CHINA (2021) [hereinafter PBOC WHITE PAPER].

74. *Id.* at 3.

75. *Id.* at 5.

1. *Two-tier architecture*

The e-CNY adopted a “two-tier,” or indirect, architecture. Rather than providing consumers with accounts at the central bank, the PBOC will issue the e-CNY to “authorized operators” like commercial banks and other financial intermediaries, which will then redistribute it to consumers along with the provision of “exchange and circulation services to the public.”⁷⁶ Although the e-CNY may appear to empower China’s central bank over commercial banks, the chosen architecture does not completely exclude commercial banks and private payment tools like WeChat Pay or Alipay. PBOC acknowledges the relative strengths of these authorized operators, and tasks them with KYC onboarding responsibilities, along with the design and management of wallets.⁷⁷

2. *Uncertain infrastructure*

It is not clear whether the e-CNY infrastructure will be centralized or distributed. Although PBOC officials have at times publicly disclaimed the use of blockchain technology,⁷⁸ and other times have emphasized the aspects in which blockchain will be used,⁷⁹ the White Paper seems to indicate that it will contain elements of both centralized and distributed technology:

*The e-CNY system adopts a distributed and platform-based design. . . (it) combines centralized architecture with distributed architecture, forming a hybrid technical framework featuring the co-existence of dual states, namely, steady state and agile state, as well as the integrated architecture of centralized and distributed architectures.*⁸⁰

76. See *id.* at 3; see also HARVARD KENNEDY SCH. BELFER CTR. FOR SCI. & INT’L AFFS, CURRENCY WARS: A NATIONAL SECURITY SIMULATION 9 (2020).

77. See PBOC WHITE PAPER, *supra* note 73, at 8.

78. See Du Chuan (杜川), *Mu Changchun Tan Yangbang Shuzi Huobi: Yanjiule Wunian, Xian “Hu Zhi Yu Chu”* (穆长春谈央行数字货币：研究了五年，现“呼之欲出”) [*Mu Changchun Discusses CBDC: After Five Years of Research, Now Ready to Come Out*], *Diyi Caijing* (第一财经) [YICAI] (Aug. 11, 2019, 2:46 PM), <https://www.yicai.com/news/100291222.html> [<https://perma.cc/LQ45-NP2G>].

79. Speaking two months after the issuance of the PBOC White Paper, Deputy Director of the Digital Currency Research Institute (who presumably reports to Director Mu Changchun) noted that PBOC is exploring using blockchain at the issuance layer (fahang ceng (发行层)). See *Yangbang Shuyansuo Tan Qukuailian: Jishu Shangqu Zhongxinhua Bing Bu Dengyu Guanli Qu Zhongxinhua* (央行数研所谈区块链：技术上去中心化并不等于管理去中心化) [PBOC Digital Research Institute Discusses Blockchain: Technical Decentralization Doesn’t Mean Managerial Decentralization], *Xinlang Caijing* (新浪财经) [SINA] (Sept. 13, 2021, 4:24 PM), <https://finance.sina.com.cn/blockchain/roll/2021-09-13/doc-iktzscyx3969921.shtml> [<https://perma.cc/9FZ7-5QYD>]; see also *China Explores Using Blockchain for Digital Yuan CBDC Issuance*, LEDGER INSIGHTS (Sept. 13, 2021), <https://www.ledgerinsights.com/china-explores-using-blockchain-for-digital-yuan-cbdc-issuance/> [<https://perma.cc/RPV4-5WMY>].

80. See PBOC WHITE PAPER, *supra* note 73, at 10; see also Vipin Bharathan, *E-CNY Progress Report Reveals Telling Details About the Chinese Retail CBDC Project*, FORBES (July 19, 2021), <https://www.forbes.com/sites/vipinbharathan/2021/07/19/e-cny-progress-report-reveals-telling-details-about-the-chinese-retail-cbdc-project/?sh=4a2499a76a59> [<https://perma.cc/J8CH-N5SQ>] (“Whether blockchain is used in the system; the PBOC remains mum on the question, but reveals that it is a hybrid of a distributed and platform-based design, for scalability.”).

There seem to be several design possibilities based on this description. At the top tier, between the PBOC and the authorized operators, PBOC could manage a “conventional centrally controlled database,” much like the current system for wholesale payments.⁸¹ Or, it could adopt a distributed but permissioned ledger system with the operators as the permissioned nodes.⁸² At the second tier, as between authorized operators and individuals, the sheer number of individual transactions might make the use of a distributed ledger technology prohibitively slow, so the ledger is likely to be centralized.

3. *Unclear access*

The e-CNY’s access system is even more convoluted: “E-CNY is . . . a value-based, quasi-account-based and account-based hybrid payment instrument, [that] enables value transfer via token[, and is] loosely coupled with bank accounts.”⁸³ This description may indicate that various access technologies will be employed across the system—perhaps one between PBOC and authorized operators, and another between operators and consumers. Or, it may indicate that a final decision has not yet been made.⁸⁴

One additional unclear element of access to the e-CNY is the extent to which e-CNY transactions can be used without internet connection. Although the primary emphasis is on the development of a digital currency, PBOC is also exploring offline functionality to service users who may live in areas with unreliable internet connections, or who are unfamiliar with digital technology.⁸⁵

4. *No interest and quantitative limits*

The PBOC White Paper appears sensitive to the risks of financial disintermediation. For example, the e-CNY will neither pay nor carry inter-

81. Auer & Böhme, *supra* note 4, at 91.

82. *See id.* at 92 (noting that although distributed ledger technology may be inappropriate for direct architecture systems, it “could be used for the indirect CBDC architecture, as the number of transactions in many wholesale payment systems is comparable with that handled by existing blockchain platforms . . .”).

83. PBOC WHITE PAPER, *supra* note 73, at 3, 7; *see also* Bharathan, *supra* note 80 (“quasi-account-based (whatever that means)”).

84. Either way, these terms may also indicate a certain weakness in the taxonomy of “token-based” and “account-based” digital currencies. Writers on the New York Fed’s blog note that Bitcoin fits the definition of both a token- and an account-based system. Rod Garratt et al., *Token- or Account-Based? A Digital Currency Can Be Both*, LIBERTY ST. ECON. (Aug. 12, 2020), <https://libertystreeteconomics.newyorkfed.org/2020/08/token-or-account-based-a-digital-currency-can-be-both/> [<https://perma.cc/779A-PQNQ>].

85. PBOC WHITE PAPER, *supra* note 73, at 9; *see also supra* Section I.B.3; Martin Chorzempa, *Promise and Peril of Digital Money in China*, CATO J. (2021); James T. Areddy, *China Flooding Exposed Risks in Beijing’s Plan to Launch Digital Currency*, WALL ST. J. (Oct. 19, 2021), <https://www.wsj.com/articles/china-flooding-exposed-risks-in-beijings-plan-to-launch-digital-currency-11634654928> [<https://perma.cc/FMW2-SB94>] (noting that “offline capabilities appear designed for a relatively small subset of users, like less tech-savvy elderly people, not millions cut off by a natural disaster”).

est.⁸⁶ This will remove some element of competition with commercial banks. Additionally, the e-CNY will exist within a “framework of big data analysis, risk monitoring and early warning for e-CNY to enhance the foresightedness, accuracy and effectiveness of e-CNY management.”⁸⁷ Though not explicitly stated, this framework perhaps hints at a safety valve that could disallow withdrawals from commercial bank deposits into e-CNY during moments of financial stress.

5. “Technically ready for cross-border use”

Finally, although the e-CNY is described as primarily intended for domestic use, it is “technically ready for cross-border use.”⁸⁸ The PBOC White Paper takes a cautious tone with regard to whether the e-CNY will be used in cross-border payments, or to promote RMB internationalization.⁸⁹ In fact, China has already undertaken a program with Bank for International Settlements (“BIS”), Hong Kong, Thailand, and the United Arab Emirates to experiment with cross-border CBDC transactions that would allow nearly instantaneous transactions to be settled outside of the established payment networks.⁹⁰

B. Desired e-CNY Functionalities

Although the exact design of the e-CNY is apparently still to be determined, the White Paper highlights three additional important functionalities. The first functionality, an element intended to mitigate the possibility of bank runs and financial disintermediation, is a tiered system of wallets. These will be designed and managed by the authorized financial intermediaries under PBOC guidance.⁹¹ Different tiers of wallets will have different per-transaction and balance limits, thereby preventing users from withdrawing the entirety of their commercial bank deposits into their e-CNY wallets. Tiers will be tied to KYC requirements according to a principle of “anonymity for small value and traceable for high value.”⁹² The “least-privileged” wallets—likely those with the strictest balance and transaction limits—can be opened without providing any identification, thereby

86. PBOC WHITE PAPER, *supra* note 73, at 7.

87. *Id.* at 12.

88. *Id.* at 5.

89. Although the White Paper does not emphasize the e-CNY’s cross-border potential, Director Mu Changchun—one of the e-CNY’s key designers—has elsewhere been more enthusiastic about its international uses. See Eliza Gkritsi, *China, Hong Kong Enter Second Phase of Cross-Border Digital Yuan Trials: Report*, COINDESK (Dec. 9, 2021), <https://www.coindesk.com/policy/2021/12/09/china-hong-kong-enter-second-phase-of-cross-border-digital-yuan-trials-report/> [<https://perma.cc/4R85-98L3>].

90. See Robert Greene, *Beijing’s Global Ambitions for Central Bank Digital Currencies Are Growing Clearer*, CARNEGIE ENDOWMENT FOR INT’L PEACE (Oct. 6, 2021), <https://carnegieendowment.org/2021/10/06/beijing-s-global-ambitions-for-central-bank-digital-currencies-are-growing-clearer-pub-85503> [<https://perma.cc/R922-5RBE>].

91. PBOC WHITE PAPER, *supra* note 73, at 8–9.

92. *Id.* at 7.

allowing some degree of anonymity. More privileged wallets will require greater identifying information, and can be opened by both individuals and organizations. PBOC highlights the ability for this system to guard against criminal activities, as well as the relative privacy as compared to payment systems administered currently by commercial entities. Although PBOC officials describe this system as one of “controllable anonymity,”⁹³ the anonymity likely only applies as to the individual parties to a transaction; PBOC will still maintain complete visibility into these transactions.⁹⁴

Next, the e-CNY will use smart contracts to become “programmable.”⁹⁵ PBOC notes that this feature will be guided by “security and compliance” concerns, and will enable “self-executing payments according to predefined conditions or terms agreed between two parties.”⁹⁶ Though not stated directly, this mechanism could be used to prevent users from completing transactions with undesirable entities—those associated with certain criminal enterprises, for example, or perhaps politically undesirable entities.⁹⁷ In pilot programs, this feature has been in the form of an expiration date, only allowing the currency to be spent for a certain period of time.⁹⁸ In future scenarios, it could be possible for government-issued stimulus payments to come with a smart contract that only allows the e-CNY to be spent in certain sectors, thereby facilitating more precise macroeconomic policy.

* * *

In sum, the e-CNY appears to still be a work in progress. It is clear that it will employ a two-tiered architecture; less clear is the extent to which its infrastructure will be centralized or distributed, or where on the spectrum between account- and token-based its access system will fall. Those ambiguities notwithstanding, its design anticipates the impact on commercial banks with a tiered wallet system that also incorporates KYC elements. Although PBOC emphasizes the ability for users to maintain some degree of controllable anonymity, the e-CNY’s propensity for surveillance and control are also obvious. Finally, although the e-CNY is primarily positioned as a domestic retail currency, PBOC has already begun to explore international applications.

93. See Reuters Staff, *China’s Digital Currency not Seeking ‘Full Control’ of Individuals’ Details – Central Bank Official* (Nov. 12, 2019), <https://www.reuters.com/article/china-markets-digital-currency-idINKBN1XM0JA> [<https://perma.cc/2MBF-CSNT>].

94. See Akram Keram, *Opinion, China Wants To Take the Entire Country Cashless — and Surveil Its Citizens Even More Closely*, WASH. POST (Mar. 2, 2021), <https://www.washingtonpost.com/opinions/2021/03/02/china-digital-yuan-currency-surveillance-privacy/> [<https://perma.cc/AG9M-XCHX>]; see also Paul Muir, *Why China’s Digital Yuan is a ‘Dictator’s Dream’*, ASIA TIMES (Nov. 27, 2019), <https://asia-times.com/2019/11/why-chinas-digital-yuan-is-a-dictators-dream/> [<https://perma.cc/YF8Y-7P36>].

95. PBOC WHITE PAPER, *supra* note 73, at 8.

96. *Id.*

97. See *infra* Section IV.D.

98. See Areddy, *supra* note 1.

III. FRAMING THE E-CNY: THE DOMESTIC MOTIVATIONS

This Part first discusses the progression of China's prohibition on private virtual currencies, which it sees as a financial risk and potential threat to national security. Areas of particular concern include AML/CTF compliance, gambling, and capital controls. It will then discuss China's increased regulatory scrutiny of private payment platforms like Ant Group's Alipay, which evinces a desire to reassert control over the payment rails away from powerful tech entrepreneurs who once saw themselves as potentially beyond the reach of the state. Viewed against these regulatory moves, some of the e-CNY's domestic motivations become clear. China clearly hopes to retain the advantages of strong payments technologies,⁹⁹ but the resulting negative externalities—financial crime, capital outflows, unruly entrepreneurs—are ones it hopes can be addressed by a CBDC. This is not to say that the only motivating factors are domestic: China certainly hopes to reduce reliance on U.S.-dominated international financial infrastructure in the long-run. But, to achieve such goals, it must first address these shorter-term domestic priorities.

To properly understand the motivations behind China's early attention to virtual currencies and blockchain technology, an introductory word is in order on China's internal narrative around technological development and the acquisition of national power. Most broadly, China attributes its relative weakness over the last century to a failure to lead technologically.¹⁰⁰ Its leaders believe that if China is to regain its proper place in the world order, it must lead in cutting-edge technologies. For example, the Party's "Innovation-Driven Development Strategy" states:

It is the nation's destiny to be innovation-driven. The core support of national strength is technological innovation capability. National prosperity follows from strength in innovation, and national misfortune follows from weakness in innovation. A major cause of China's stagnation in the modern era was that it let previous technological revolutions pass it by, leading to technological and national weakness. To achieve the Chinese dream of the great rejuvenation of the Chinese nation (中华民族), one must truly

99. See Jean-Christophe Plantin & Gabriele de Seta, *WeChat as Infrastructure: the Techno Nationalist Shaping of Chinese Digital Platforms*, 12 J. CHINESE COMM. 257, 257 (2019) (finding that "the infrastructuralization of the WeChat platform model in China is shaped by markedly techno-nationalist media regulations and an increasingly overt cyber-sovereignty agenda," where China's techno-nationalist context is described as mobilizing technological development to "secure national interests and advantages").

100. See, e.g., Alison A. Kaufman, *Testimony Before the U.S.-China Economic and Security Review Commission Hearing on "China's Narratives Regarding National Security Policy"—The 'Century of Humiliation' and China's National Narratives* (Mar. 10, 2011), <https://www.uscc.gov/sites/default/files/3.10.11Kaufman.pdf> (discussing the "role that China's historical memories of subjugation at the hands of Western powers during the 19th and early 20th centuries play in PRC policy debates, particularly debates about the current state of geopolitics and about China's emergence as a great power.").

make good use of science and technology, which is a revolution in the highest sense and a powerful lever.¹⁰¹

Official statements like this highlight the importance of understanding China's domestic policy motivations: only when it is strong domestically can it properly achieve its international goals.¹⁰² China's most senior leaders recognized early on that the technology underlying virtual currencies—although potentially a threat to the Party's established power—could also allow them to leap-frog other nations and establish the nation as a global leader in financial technology.

Much of the popular commentary in Western media concerning the e-CNY focuses on the challenge it might pose to the international status quo.¹⁰³ It is true that a Chinese alternative to the present international financial system does have important implications for the current U.S.-led order, and that China does hope to reduce reliance on U.S.-dominated aspects of the international financial system in the decades ahead.¹⁰⁴ However, this represents part of China's long-term goal in establishing national strength. More immediately, Chinese policymakers are motivated by more domestic priorities. Namely, they are driven to crack down on financial crime and illegal gambling, reassert control over outbound capital flows, and address an increasingly concentrated market of private sector payments platforms.

101. *Guojia Chuangxin Qudong Fazhan Zhanlie Gangyao* (国家创新驱动发展战略纲要) (May 19, 2016), http://www.xinhuanet.com/politics/2016-05/19/c_1118898033.htm [https://perma.cc/24KE-22KK] (issued by the Central Committee of the Communist Party of China & State Council), translated in *Outline of the National Innovation-Driven Development Strategy 2* (Ctr. for Sec. and Emerging Tech., Dec. 11, 2019), https://cset.georgetown.edu/wp-content/uploads/t0076_innovation_driven_development_strategy_EN.pdf [https://perma.cc/FL8F-HS7Q]. For context, the Central Committee is comprised of the Party's 376 most senior decisionmakers. See US-CHINA BUS. COUNCIL, *CHINA'S 2017 COMMUNIST PARTY LEADERSHIP STRUCTURE & TRANSITION* (2017).

102. See *supra* text accompanying note 11.

103. See David P. Goldman, *Digital Yuan Could Bust the United States*, *ASIA TIMES* (Feb. 6, 2021), <https://asiatimes.com/2021/02/digital-yuan-could-bust-the-united-states/> [https://perma.cc/2L9Y-6CZY] (“When—and the issue is when rather than if—China’s currency assumes a world status commensurate with its economic standing, the dollar’s reserve role will fade like the pound sterling before it, and the United States will have to learn to spend within its means.”); Saleha Mohsin, *Biden Team Eyes Potential Threat From China’s Digital Yuan*, *BLOOMBERG* (Apr. 11, 2021), <https://www.bloomberg.com/news/articles/2021-04-11/biden-team-eyes-potential-threat-from-china-s-digital-yuan-plans> [https://perma.cc/47WZ-KPNK]; Greene, *supra* note 90; *Will Going Digital Transform the Yuan’s Status at Home and Abroad?*, *ECONOMIST* (May 8, 2021), <https://www.economist.com/finance-and-economics/2021/05/06/will-going-digital-transform-the-yuans-status-at-home-and-abroad> [https://perma.cc/J34L-A5HV].

104. See Areddy, *supra* note 1 (“The chance to weaken the power of American sanctions is central to Beijing’s marketing of the digital yuan and to its efforts to internationalize the yuan more generally. Speaking at a forum last month, China’s Mr. Mu, the central bank official, repeatedly said the digital yuan is aimed at protecting China’s ‘monetary sovereignty,’ including by offsetting global use of the dollar.”).

A. *China's Crypto Crackdown: A History*

China's early attention to the trading and mining of private cryptocurrencies began with an attitude of official, if not wary, tolerance. This attitude abruptly ended in 2021, with harsh criminal penalties levied against scores of individuals and organizations accused of perpetrating financial crimes involving cryptocurrency.¹⁰⁵ Most notably, PBOC announced that it is illegal for entities outside of China to provide services related to cryptocurrencies to Chinese citizens in China via the internet—an expansively extraterritorial provision that may have implications for foreign financial institutions in China, or even for businesses outside of China that service Chinese customers abroad.

1. *From official tolerance. . .*

China's first attempt in December 2013 prohibited financial institutions and payment platforms from offering Bitcoin-related services.¹⁰⁶ This ban prohibited financial and payment institutions from offering any Bitcoin-related services, including the facilitation of the exchange of Bitcoin, accepting Bitcoin as a payment, or offering an open-ended range of financial products or services based on Bitcoin. Although the Notice resulted in a temporary drop in Bitcoin's value,¹⁰⁷ lax enforcement meant that this regulation did relatively little to slow Bitcoin's popularity in China. For example, in spite of the formal ban on commercial Bitcoin exchanges, many peer-to-peer ("P2P") and over-the-counter ("OTC") exchanges continued without objection from the government. Indeed, in 2017, regulators in Beijing and Shanghai conducted spot checks of cryptocurrency exchanges in those cities, not to close them down, but to ensure adherence to AML rules.¹⁰⁸

The next set of cryptocurrency prohibitions were introduced in September 2017 in the form of a ban on Initial Coin Offerings ("ICOs") as an illegal form of public financing.¹⁰⁹ The primary motivation behind the announce-

105. Notably, the United States is playing catch-up in this regard—quite literally. The Fed, FDIC, and OCC recently announced a "Policy Sprint Initiative" intended to ensure that regulations properly account for risks to safety and soundness, consumer protection, and compliance with AML/CTF requirements. See JOINT STATEMENT ON CRYPTO-ASSET POLICY SPRINT INITIATIVE AND NEXT STEPS; BD. OF GOVERNORS OF THE FED. RESV. SYS., FED. DEPOSIT INS. CORP., OFF. OF THE COMPTROLLER OF THE CURRENCY (2021), <https://www.federalreserve.gov/newsevents/pressreleases/files/bcreg20211123a1.pdf> [<https://perma.cc/72N6-QZ5W>].

106. Notice on Preventing Bitcoin Risks, *supra* note 65.

107. See Schumpeter, *Bitcoin's Collapse: China Blues*, *ECONOMIST* (Dec. 18, 2013), <https://www.economist.com/schumpeter/2013/12/18/china-blues> [<https://perma.cc/UTE9-3L7T>] (reporting that the price of Bitcoin dropped below \$500 from a high of \$1,200 following the announcement).

108. See Sherisee Pham, *China Is Freaking Out Bitcoin Traders*, *CNN BUS.* (Jan. 12, 2017), <https://money.cnn.com/2017/01/12/investing/bitcoin-price-china-visit/?iid=EL> [<https://perma.cc/8ALM-XNDY>].

109. *Guanyu Fangfan Daibi Fabang Rongzi Fengxian de Gonggao* (关于防范代币发行融资风险的公告) [Announcement on Preventing the Risk of Token Issuance Financing] (Sept. 4, 2017, 3:00 PM), <http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/3374222/index.html> [<https://perma.cc/68Y6-G3FV>] (issued by seven governmental departments: PBOC, Cyberspace

ment appears to have been concern about the stability risks that such speculative investments posed to the financial system. However, the announcement also reiterated China's 2013 prohibitions in sterner language, prohibiting the exchange of legal currency for virtual currency and specifically directing telecom regulators to remove such exchange apps from online app stores. The *Wall Street Journal* described the announcement as "the most draconian measures any government has taken to control bitcoin."¹¹⁰

Despite this extreme characterization, some official commentators suggested that the ban was focused only on illegal behavior, and that there was a role for cryptocurrency in China. For example, an editorial published by China's state-run media in October 2017 highlighted a regulatory agenda that would address many concerns, suggesting a potential legal path forward for cryptocurrencies—or at least official indulgence.¹¹¹

Nevertheless, the 2017 ban on exchanges effectively drove most of China's exchanges underground and offshore. Many users continued to trade via messaging apps, or on offshore exchanges accessed via VPNs that allowed circumvention of China's internet controls. In response, several ministries issued a joint "risk warning" in 2018 that highlighted the criminal fraud involved in continued cryptocurrency fundraising schemes.¹¹² Such schemes "are not really based on blockchain technology," the warning stated, "but are instead illegal fundraising, pyramid schemes, and fraud achieved by hyping blockchain concepts."¹¹³ The warning emphasized that these "lawbreakers" had set up websites with overseas servers to circumvent China's regulations yet continued to target Mainland residents. In addition to concerns about fraudulent activity, the warning also belied worries about outbound capital flows. Notably, the Ministry of Public Security ("MPS") was among the regulators that issued the warning, signaling the potential for more stringent—or punitive—enforcement.

Administration of China, Ministry of Industry and Information Technology, State Administration for Industry and Commerce, China Banking Regulatory Commission, China Securities Regulatory Commission, China Insurance Regulatory Commission).

110. Chao Deng, *China's Interference on Bitcoin Tests Currency's Foundation*, WALL ST. J. (Sept. 18, 2017), <https://www.wsj.com/articles/china-widens-bitcoin-crackdown-beyond-commercial-trading-1505733976> [<https://perma.cc/28TQ-FL69>].

111. See Pan Ye (潘晔), *Xinhua Shiping: Dui Xuni Huobi Yinni Fanzui "Ling Rongren" (新华时评: 对虚拟货币隐匿犯罪“零容忍”)* [Xinhua Editorial: "Zero Tolerance" for Concealed Crimes of Virtual Currency], *Xinhua Wang* (新华网) [XINHUA NET] (Oct. 4, 2017), <http://www.ehuataifund.com/upload/pdf/1507529257597-xinhuashipinglun.pdf> [<https://perma.cc/UZ4T-H2PJ>].

112. Guanyu Fangfan Yi "Xuni Huobi" "Qukuailian" Mingyi Jinxing Feifa Jizi de Fengxian Tishi (关于防范以“虚拟货币”“区块链”名义进行非法集资的风险提示) [Risk Warning on Preventing Illegal Fundraising in the Name of "Virtual Currency" and "Blockchain"], (Aug. 8, 2018, 3:00 PM), http://www.cac.gov.cn/2018-08/24/c_1123317731.htm [<https://perma.cc/9SBW-98LD>] (issued by five governmental departments: China Banking and Insurance Regulatory Commission, Cyberspace Administration of China, Ministry of Public Security, PBOC, State Administration for Market Regulation).

113. See *id.* The U.S. Securities and Exchange Commission is similarly wary of the fraud risks presented by ICOs. See generally *Spotlight on Initial Coin Offerings (ICOs)*, U.S. SEC. & EXCH. COMM'N, <https://www.sec.gov/ICO> [<https://perma.cc/2DWA-2L2N>].

Bitcoin mining operations also flourished in China: it is estimated that, at its peak, more than three-quarters of Bitcoin in circulation were mined there.¹¹⁴ These operations were not subject to significant regulatory attention until early 2018, when an interagency internet finance regulator called for the “orderly exit” of mining operations, although without a specific deadline or outright ban.¹¹⁵ Miners largely flaunted the directive and continued to flourish in more remote parts of the country, drawn there by looser regulations and lower energy costs.¹¹⁶

2. . . . To criminalization

Official tolerance for private cryptocurrency withered and died in 2021, as shown by the individuals and agencies made responsible for eliminating crypto and the harshness of the actions they have taken. For example, Vice Premier Liu He recently called for a crackdown on Bitcoin mining and trading activity.¹¹⁷ His attention to cryptocurrency in his role as head of the State Council’s Financial Stability and Development Commission would motivate enforcement agencies at the central and local levels to carry out this crackdown. Not long after Liu’s statement, PBOC held meetings with China’s largest financial institutions—including state-owned banks as well as private entities like Ant Group’s Alipay—to stop providing services for virtual currencies and to scrutinize transactions that appear to involve virtual currency exchanges.¹¹⁸ Shortly thereafter, the ban on bitcoin mining was finally enforced.¹¹⁹

114. James T. Areddy, *China Reconsiders Its Central Role in Bitcoin Mining*, WALL ST. J. (June 5, 2021), https://www.wsj.com/articles/china-reconsiders-its-central-role-in-bitcoin-mining-11622865618?mod=article_inline [<https://perma.cc/3BDH-LLPT>].

115. See Yin Yi (殷怡), *Du Jia: Hujin Zhengzhiban Fawen: Gedi Yindao Xianei Qiye Youxu Tuichu “Wa Kuang” Yewu* (独家 | 互金整治办发文明: 各地引导辖内企业有序退出“挖矿”业务) [Exclusive: Internet Financial Risk Special Rectification Office Small Leading Group Issues Document: Localities Guide Enterprises Within Their Jurisdictions to Withdraw from the “Mining” Business in an Orderly Manner], *Diyi Caijing* (第一财经) [YICAI], (Jan. 6, 2018, 6:36 AM), <https://www.yicai.com/news/5389628.html> [<https://perma.cc/NJ3M-XLHS>].

116. See Areddy, *supra* note 113.

117. See Press Release, Liu He Zhuochi Zhaokai Guowuyuan Jinrong Wending Fazhan Weiyuanhui Di Wushiyi Ci Huiyi (刘鹤主持召开国务院金融稳定发展委员会第五十一次会议) [Liu He Presided Over 51st Meeting of the State Council Financial Stability and Development Committee] (May 21, 2021, 10:00 PM), http://www.gov.cn/xinwen/2021-05/21/content_5610192.htm [<https://perma.cc/K2WS-LWLS>]. Liu is a senior technocrat and trusted aide of President Xi Jinping often tasked with China’s most challenging issues, including U.S.-China trade talks, industrial policy, and the reform of China’s state-owned entities. See Cheng Li, *Xi Jinping’s Inner Circle (Part 2: Friends from Xi’s Formative Years)*, 44 CHINA LEADERSHIP MONITOR 8 (2014).

118. See Yanjin Xiani Huobi Jiaoyi Chaozuo, Yangbang Yuetan Bufen Yinbang He Zhifu Jigou (严禁虚拟货币交易炒作 央行约谈部分银行和支付机构) [Virtual Currency Transaction Hype is Strictly Prohibited, PBOC Interviews some Banks and Payment Institutions], *Zhongguo Zhengquanbao* (中国证券报) [CHINA SEC. J.], (June 22, 2021, 10:01 AM), http://www.xinhuanet.com/fortune/2021-06/22/c_1127586010.htm [<https://perma.cc/CA6N-4589>].

119. See Samuel Shen & Andrew Galbraith, *China’s Ban Forces Some Bitcoin Miners To Flee Overseas, Others Sell Out*, REUTERS (June 25, 2021), <https://www.reuters.com/technology/chinas-ban-forces-some-bitcoin-miners-flee-overseas-others-sell-out-2021-06-25/> (last visited Apr. 12, 2022).

Relatedly, money laundering and fraud are a prime regulatory target: one media outlet highlighted that police across twenty-three provinces arrested more than 1,100 suspects from 170 criminal groups accused of using cryptocurrency to launder money obtained through fraudulent scams.¹²⁰ The focus on cryptocurrency's role in financial crime is connected to a larger regulatory push to improve AML/CTF frameworks. For example, a recent Financial Action Task Force ("FATF") report has noted a number of improvements in China's approach to these issues, including revised regulations that require financial institutions and payments companies to develop more robust AML compliance mechanisms.¹²¹

Gambling is also at the center of China's regulatory drive. MPS also took a more active role in eliminating cryptocurrencies as they facilitate illegal gambling operations. For example, one senior MPS official noted that more than one trillion Renminbi (145 billion dollars) flows out of China annually for gambling—a situation he described as adding to economic and financial security risks.¹²² He noted that some "gangs running illegal operations use digital currencies to collect and transfer funds, making it difficult to trace the source and adding significant challenges to investigations."¹²³ He also emphasized that such outflows are dangerous for China's national security because of "potential collusion between gambling operators and 'foreign powers'" —in part because foreign casinos may conduct background checks on high-net-worth gamblers, and in part because such individuals may use foreign casinos to evade capital controls.¹²⁴ He continued:

There are so many casinos overseas that have very thoroughly investigated the assets of many domestic business entrepreneurs, of

120. Elaine Yu & Caitlin Ostroff, *Chinese Police Arrest 1,100 People for Money Laundering with Cryptocurrencies*, WALL ST. J. (June 10, 2021), https://www.wsj.com/articles/chinese-police-arrest-1-100-people-for-money-laundering-with-cryptocurrencies-11623332776?mod=article_inline [https://perma.cc/H79H-44CJ].

121. The report re-rated China as "compliant" for revisions made to the Measures for Supervision and Administration on Anti-Money Laundering and Countering the Financing of Terrorism in Financial Institutions, which required payment institutions to establish and improve AML/CTF internal control policies and to develop and implement training and audit programs. It also improved civil and criminal liabilities for individuals and entities found responsible for money laundering. See FATF, ANTI-MONEY LAUNDERING AND COUNTER-TERRORIST FINANCING MEASURES—PEOPLE'S REPUBLIC OF CHINA: 2ND ENHANCED FOLLOW-UP REPORT & TECHNICAL COMPLIANCE RE-RATING 2–4 (Oct. 2021), <https://www.fatf-gafi.org/media/fatf/documents/reports/fur/Follow-Up-Report-China-2021.pdf> [https://perma.cc/WR97-WH3L].

122. Cheng Weimiao (程维妙), *Gonganbu Liao Jinrong: Meimian Liu Dao Jingwai Duzi Cbao Wanyi, Xumi Huobi Zhuanzhang Shi Zhengzhi Nandian* (公安部廖进荣: 每年流到境外赌资超万亿, 虚拟货币转账是整治难点) [Ministry of Public Security's Liao Jinrong: Outbound Gambling Flows Exceed RMB One Trillion Annually, Virtual Currency is a Governance Difficulty], Beike Caijing Xun (贝壳财经讯) [BK ECON. NEWS] (Sept. 24, 2020, 11:19 PM) www.sohu.com/a/420585488_114988 [https://perma.cc/A3K7-XUWD].

123. *Id.*

124. *Id.*

many individuals, and even of related individuals. This is very insecure for us.¹²⁵

More concretely, MPS has arrested scores of individuals in connection with gambling operations. In April 2021, police in Jiangsu Province were the first nationally to take action against an online casino using blockchain technology, arresting twenty-five suspects and seizing more than twenty-six million Renminbi (four million dollars) worth of virtual currency.¹²⁶ As with money laundering and financial crime, these cryptocurrency-related moves are connected to a larger push against gambling generally. Chinese authorities have long been displeased with the outflow of capital to Macau's casinos and beyond. Such outflow can be facilitated by "junkets," companies that arrange trips for high rollers to the region, often providing credit facilities and other financial services of dubious legality.¹²⁷ Police in Macau recently arrested the head of one of the largest junkets, signaling the end of official tolerance for the industry.¹²⁸ Other media report that regulators have approached casino operators to assess the feasibility of purchasing casino chips with e-CNY.¹²⁹ That the e-CNY will be integrated with the region's gaming industry indicates a desire to reduce money laundering, tax evasion, and the financing of terrorism—issues that present a threat to China's "economic security"¹³⁰—rather than the outright prohibition of gambling.¹³¹

125. See *id.*; see also Amanda Lee, *Cryptocurrency Helps Ship 1 Trillion Yuan Out of China to Casinos, Gambling Every Year*, S. CHINA MORNING POST (Sept. 25, 2020), <https://www.scmp.com/economy/china-economy/article/3103045/china-loses-1-trillion-yuan-casinos-and-gambling-every-year> [https://perma.cc/AGG9-N7RW].

126. See *Yong Qukuailian Jishu Kai Duchang? Jingfang Chubou, 25 Ming Fanzui Xianyiren Luowang* (用区块链技术开赌场? 警方出手, 25名犯罪嫌疑人落网) [Use Blockchain to Open a Casino? The Police Take Action and 25 Suspects are Arrested], *Zhengquan Shibao* (证券时报) [SEC. TIMES] (Apr. 16, 2021, 9:58 PM), <https://www.163.com/dy/article/G7O3VE0B053469RG.html> [https://perma.cc/MWN9-2YMC].

127. See Farah Master, *Macau VIP Casino Industry Out of Luck as China Cracks Down on Capital Flows*, REUTERS (Aug. 17, 2020), <https://www.reuters.com/article/us-china-gambling/macau-vip-casino-industry-out-of-luck-as-china-cracks-down-on-capital-flows-idUSKCN25D2O7> [https://perma.cc/S7YR-3TJF].

128. See Eduardo Baptista, *Arrest of Macau's 'Junket Mogul' Rattles the World's Largest Gambling Hub*, REUTERS (Nov. 30, 2021), <https://www.reuters.com/world/asia-pacific/macau-gambling-group-suncityshares-hit-record-low-after-chairman-arrested-2021-11-30/> [https://perma.cc/2CTD-5CCE].

129. See Farah Master, *Macau's Digital Yuan Plans Deal Fresh Blow to Casino Junkets*, REUTERS (Apr. 22, 2021), <https://www.reuters.com/world/china/macaus-digital-yuan-plans-deal-fresh-blow-casino-junkets-2021-04-22/> [https://perma.cc/4C23-KCVA].

130. Primrose Riordan et al., *Macau Casinos Gamble on Relations with Beijing*, FIN. TIMES (Nov. 28, 2021), <https://www.ft.com/content/135e81bf-a501-4371-801e-3acc7b0ae80f> [https://perma.cc/NVH9-MU46] (quoting Sonny Lo, author of *Casino Capitalism, Society and Politics in China's Macau*, as saying that "China is attaching importance to Macau's economic security . . . and [in Beijing's eyes] casinos should not be used as a conduit for money laundering or used to channel treasures out of Macau.").

131. See Bloomberg News, *Macau Moves Step Closer to Digital Currency in Threat to Casinos*, BLOOMBERG (Apr. 14, 2021), <https://www.bloomberg.com/news/articles/2021-04-14/macau-moves-step-closer-to-digital-currency-in-threat-to-casinos> [https://perma.cc/TM7S-PLFB].

Macau is expected to reduce its reliance on gambling and become instead a general tourism and leisure hub.¹³²

Finally, in September 2021, PBOC issued a notice outlawing all cryptocurrency-related transactions.¹³³ Although the notice might appear to be one of many in a long stream of official pronouncements, this one distinguished itself with its stark language and broad reach. It clearly stated that no type of virtual currency can be used as currency in the market; that a long list of activities involving virtual currencies are illegal financial activities subject to criminal penalties; and, most notably, that the provision of any service via the internet involving cryptocurrency by an overseas entity to Chinese residents within China constitutes an illegal financial activity.¹³⁴ It puts financial institutions with employees in China on notice that anyone who knows, or should know, of the provision of any services related to cryptocurrencies will be subject to “investigation.”¹³⁵

Although this notice does not clearly speak to overseas organizations that provide services to Chinese citizens outside of China, attempts to assert extraterritorial jurisdiction have become more pronounced by other Chinese regulators. For example, a new Ministry of Commerce regulation imposes liability on companies in compliance with China-related sanctions or other restrictions imposed by foreign nations.¹³⁶ Moreover, China’s extraterritorial reach often finds expression through more indirect means, like placing pressure on China-based relatives—either corporate subsidiaries or family mem-

132. See Shirley Zhao, *China’s Casino Crackdown Part of Quest to Transform Macau*, BLOOMBERG (Sept. 23, 2021), <https://www.bloomberg.com/news/articles/2021-09-23/china-s-casino-crackdown-part-of-big-ger-quest-to-transform-macau> [https://perma.cc/Q33S-DGAL]; see also Elaine Yu, *Casino Stocks in China’s Gambling Hub Are Out of Luck*, WALL ST. J. (Nov. 26, 2021), <https://www.wsj.com/articles/casino-stocks-in-chinas-gambling-hub-are-out-of-luck-11637922601> [https://perma.cc/K3QN-6DVD] (referencing revisions to Macau’s gambling regulations that propose “giving the state a veto over dividend payments to shareholders and introducing government representatives to monitor casinos’ day-to-day operations”).

133. *Guanyu Jin Yi Bu Fangfan He Chuzhi Xiini Huobi Jiaoyi Chaozuo Fengxian de Tongzhi* (关于进一步防范和处置虚拟货币交易炒作风险的通知) [Notice on Further Preventing and Disposing of the Risk of Speculation in Virtual Currency Trading] (Sept. 15, 2021) <http://m.safe.gov.cn/safe/2021/0924/19911.html> [https://perma.cc/AG3E-ZR36] (issued by ten official bodies: PBOC, Cyber-space Administration of China, Supreme People’s Court, Supreme People’s Procuratorate, Ministry of Industry and Information Technology, Ministry of Public Security, State Administration for Market Regulation, China Banking Regulatory Commission, China Securities Regulatory Commission, State Administration of Foreign Exchange).

134. See *id.* ¶ 1.

135. “Zhuijiu” (追究). See *id.*

136. See *Zuduan Waiguo Falü Yu Cuosbi Budang Yuwai Shiyong Banfa* (阻断外国法律与措施不当域外适用办法) [Measures to Block the Improper Extraterritorial Application of Foreign Laws and Measures] (promulgated by the Ministry of Com., Jan. 9, 2021, effective Jan. 9, 2021), <http://www.mofcom.gov.cn/article/zwgk/zcfb/202101/20210103029710.shtml> [https://perma.cc/9XNU-4XXS]; see also Staff Member, *China’s Ambition of Extraterritorial Jurisdiction and the American Response*, COLUM. J. TRANSNAT’L L. (Mar. 4, 2021), <https://www.jtl.columbia.edu/bulletin-blog/chinas-ambition-of-extraterritorial-jurisdiction-and-the-american-response> [https://perma.cc/2W3D-YTJJ] (citing as well statements from the Chinese Embassy in the U.K. that characterized protests at which Chinese flags were burned as a violation of the Hong Kong National Security Law, and warnings to the Taiwanese government that providing shelter to asylum seekers from Hong Kong constituted similar violations).

bers—to extract concessions from actors based outside of China.¹³⁷ It is not inconceivable that such a ban on cryptocurrencies within China will have a chilling effect on the extent to which foreign financial institutions with growing presences in China will be willing to offer services related to cryptocurrency to Chinese nationals outside of China.¹³⁸ At a minimum, this extraterritorial effect highlights the connection between China’s domestic goals and its international presence:¹³⁹ overseas institutions that offer services related to cryptocurrency may think twice before extending those services to Chinese nationals.

* * *

This historical backdrop illustrates the extent to which domestic concerns about the risks introduced by financial technology motivate regulatory action. In the private cryptocurrency space, three concerns dominate. First, policymakers are concerned about how easily criminal activity has flourished with the availability of currencies outside of their control. The systemic risks created by financial fraud, illegal gambling, and organized crime are traditional concerns of many financial regulators, and are perhaps unsurprising here. China’s efforts to eliminate cryptocurrency as a contributor to fraud and illegal gambling closely align with its more general push to improve AML/CTF compliance, and reduce capital outflows via gambling operations in Macau. Next, the crackdown also evinces concerns about how financial technologies like ICOs outside the regulatory perimeter may further exacerbate financial risks and instability. Finally, the crackdown also indicates that authorities are concerned about the extent to which foreign entities—financial institutions, casinos, other legitimate cross-border businesses, or organized crime groups—may be able to exert control, or gain leverage, over Chinese citizens and entities via cryptocurrencies.

These concerns inform the design of the e-CNY. For example, the PBOC was clear in its White Paper that the system of tiered wallets, with complete KYC functionality, will retain the standard AML/CTF obligations in order

137. See Sebastian Rotella, *Even on U.S. Campuses, China Cracks Down on Students Who Speak Out*, PROPUBLICA (Nov. 30, 2021), <https://www.propublica.org/article/even-on-us-campuses-china-cracks-down-on-students-who-speak-out> [https://perma.cc/L7DY-JGVK](citing, for example, threats received by the China-based parents of a Chinese student studying abroad in the U.S. related to that student’s activist work); see also Cate Cadell, *Under Pressure over Xinjiang, China Takes Aim at Overseas Uighurs, Academics*, REUTERS (Apr. 9, 2021), <https://www.reuters.com/world/china/under-pressure-over-xinjiang-china-takes-aim-overseas-uighurs-academics-2021-04-09/> [https://perma.cc/QAM8-K4GC].

138. One example of such pressure is a recent statement by a Vice Minister of Foreign Affairs to a gathering of U.S. business executives, noting that “It’s good to enjoy the shade under the big tree. . . . Conversely, if the relations between the two countries deteriorate, the business community cannot ‘make a fortune in silence.’” Helen Davidson, *Beijing Warns China-Linked US Businesses: You Cannot ‘Make a Fortune in Silence’*, GUARDIAN (Dec. 2, 2021), <https://www.theguardian.com/world/2021/dec/02/beijing-warns-china-linked-us-businesses-you-cannot-make-a-fortune-in-silence> [https://perma.cc/7H4L-R5LR].

139. See *supra* text accompanying note 11.

to guard against criminal activities.¹⁴⁰ Similarly, the programmable contract function also may ensure that e-CNY are not used for illicit purposes—gambling, for example.¹⁴¹ Moreover, by ensuring that only authorized operators issue and handle e-CNY, regulators will be able to reassert control over the monetary system that had been eroded by private institutions through ICOs, for example. In sum, the e-CNY is intended to displace private cryptocurrencies and their attendant risks—of criminal activity, of financial risk, and of national security risks created by entities beyond central government control—while furthering the benefits and convenience of modern digital payment systems.

B. *Precise Disintermediation: Squashing Ant Group*

As noted above, Chinese policymakers are generally wary of issuing the e-CNY in such a way as to displace the role of commercial banks and the private sector. Although this desire to avoid financial disintermediation applies generally, it is clear that senior Chinese leaders are keen to claw back power from several private firms like Ant Group that have come to dominate the payments and consumer credit lending space. For a time, Jack Ma—the founder and long-time CEO of Alibaba and its corporate descendant Ant Group—was a source of national pride because of his innovative companies and their role in Chinese economic development.¹⁴² Regulators largely left him to his own devices, allowing China’s e-commerce and mobile payments sectors to flourish. To illustrate, although mobile payments constituted just 4% of all payments in 2012, by 2018 they accounted for 83%, and 74% of all mobile phone users made payments using mobile payment technologies on a daily basis.¹⁴³ Ant Group’s Alipay and Tencent’s WeChat processed the equivalent of forty-five trillion dollars in transactions in 2020, occupying 55.6% and 38.8% of the mobile payment market respectively.¹⁴⁴ Ma acquired so much power that he was even occasionally able to go over the heads of sectoral regulators to more senior central government leaders to fend off increased regulation of his businesses.¹⁴⁵

140. See PBOC WHITE PAPER, *supra* note 73, at 8–10.

141. As will be discussed *infra* Section IV.D, programmable contracts may also make it possible for regulators to prohibit other politically unpopular purposes as well.

142. See Keith Zhai et al., *How Billionaire Jack Ma Fell to Earth and Took Ant’s Mega IPO with Him*, REUTERS (Nov. 5, 2020, 12:30 PM), <https://www.reuters.com/article/ant-group-ipo-suspension-regulators-idUSL8N2HQ0O2> [https://perma.cc/75KU-EZHF].

143. See *Payment Methods in China: How China Became a Mobile-First Nation*, DAXUE CONSULTING (July 4, 2021), <https://daxueconsulting.com/payment-methods-in-china/> [https://perma.cc/FVA4-TJM6].

144. See Bloomberg News, *China’s Much-Hyped Digital Yuan Fails to Impress Early Users* (May 9, 2021, 5:00 PM), <https://www.bloomberg.com/news/articles/2021-05-09/china-s-much-hyped-digital-yuan-fails-to-impress-early-users> [https://perma.cc/6ZQV-G8V5].

145. See *id.* (“When the PBOC tried to regulate Ant’s payment and wealth management business about five years ago, Ma bypassed the central bank after failing to reach a consensus with regulatory officials and lobbied the central government. The PBOC later dropped those regulation plans.”).

This government deference to tech entrepreneurs disappeared in late 2020, when Ma delivered a speech criticizing Chinese regulators of operating under an overly risk-averse “pawnshop” mentality.¹⁴⁶ Instead, he argued, they should seek to foster a credit-based system that would allow smaller borrowers to obtain credit without collateral.¹⁴⁷ Public reaction to Ma’s speech was negative, as many saw this approach as encouraging predatory lending.¹⁴⁸ The official reaction was even worse: some regulators characterized the speech as a “punch in their faces” and responded in an accordingly harsh manner.¹⁴⁹ First, Ma was summoned to a meeting with four of China’s financial regulators and told that Ant Group would face tougher scrutiny over its lending businesses.¹⁵⁰ Next, the day after this meeting, the Shanghai Stock Exchange suspended Ant’s IPO, two days before it was due to occur. Ant Group, which was expected to raise around thirty-seven billion dollars in the world’s largest IPO, has had its debut delayed indefinitely.¹⁵¹ Alibaba was subsequently fined the equivalent of \$2.8 billion for violations of China’s anti-monopoly law.¹⁵² And, amidst all

146. See Keith Zhai et al., *supra* note 139.

147. See Ma Kecheng (马可诚), Mayun Shanghai Waitan Jinrong Luntan Yanjiang Quanwen (马云上海外滩金融论坛演讲全文), Qidian Caijing (奇点财经) [SINGULARITY FIN.] (Oct. 26, 2020, 11:06 PM), https://sfl.global/news_post/mayunshanghaiwaitanjinrongluntanyanjiangquanwenwushanjian/ translated in Kevin Xu, *Jack Ma’s Bund Finance Summit Speech*, INTERCONNECTED (Nov. 9, 2020), <https://interconnected.blog/jack-ma-bund-finance-summit-speech/> [https://perma.cc/KDH9-U4TP]; see also James Kynge et al., *‘The Party is Pushing Back’: Why Beijing Reined in Jack Ma and Ant*, FIN. TIMES (Nov. 4, 2020), <https://www.ft.com/content/3d2f174d-aa73-44fc-8c90-45c2a554e97b> [https://perma.cc/NQH9-AB58].

148. See Jiayun Feng, *Public Opinion on Jack Ma Swings Wildly After China Calls Off Ant Group’s IPO*, SUPCHINA (Nov. 4, 2020), <https://supchina.com/2020/11/04/public-opinion-on-jack-ma-swings-wildly-after-china-calls-off-ant-groups-ipo/> [https://perma.cc/A5NR-3NVH].

149. See Keith Zhai et al., *supra* note 139.

150. See *id.* Ma was summoned by the People’s Bank of China, the China Banking and Insurance Regulatory Commission, the China Securities Regulatory Commission, and the State Administration of Foreign Exchange. Bloomberg News, *Jack Ma Summoned by China’s Regulators on Eve of Ant Group Debut*, BUS. STANDARD (Nov. 3, 2020, 1:33 PM), https://www.business-standard.com/article/international/jack-ma-summoned-by-china-s-regulators-on-eve-of-ant-group-debut-120110300071_1.html [https://perma.cc/G788-VHB4]; see also Lingling Wei & Jing Yang, *Ant Founder Jack Ma Faces Backlash From Regulators*, WALL ST. J. (Nov. 3, 2020), <https://www.wsj.com/articles/ant-founder-jack-ma-faces-backlash-from-regulators-11604442018> [https://perma.cc/UY8C-865Z] (“It’s more than a dressing-down session,” said one of the officials with knowledge of the event. Mr. Ma and his team were informed of the new regulations targeting firms like Ant. “It means the company would have to examine how they disclose information to its investors, whether it has adequate capital level to meet the new rules, and whether it should adjust its overall business scope.”).

151. See Cissy Zhou, *China’s Ant Group Seeks New Investors After Sudden Withdrawal*, NIKKEI ASIA (Jan. 14, 2022, 6:23 PM), <https://asia.nikkei.com/Business/Finance/China-s-Ant-Group-seeks-new-investors-after-sudden-withdrawal> [https://perma.cc/85E5-M6UP]; Xie Yu, *With Ant IPO in Limbo, Funds Let Investors Cash Out*, WALL ST. J. (Nov. 11, 2020, 4:11 AM), https://www.wsj.com/articles/with-ant-ipo-in-limbo-funds-let-investors-cash-out-11605085858?modHP_lead_pos5 [https://perma.cc/2FT5-D9K7].

152. See Raymond Zhong, *China Fines Alibaba \$2.8 Billion in Landmark Antitrust Case*, N.Y. TIMES (Apr. 9, 2021), <https://www.nytimes.com/2021/04/09/technology/china-alibaba-monopoly-fine.html> [https://perma.cc/U7L4-UMEZ].

of this, Jack Ma disappeared for three months, sparking rumors that he had been detained.¹⁵³

Although this episode is somewhat removed from the payments sector specifically, it underscores the concern voiced by senior PBOC officials about the amount of control that companies like Ant Group's Alipay have over the payment rails, and the vulnerability of those companies to the whims of a few individuals.¹⁵⁴ Senior PBOC officials have recently declared an intention to deepen anti-monopoly investigations in the mobile payment space. Although PBOC does not wish to eliminate these businesses entirely, and states that it "will support platforms to focus on their core businesses and innovation,"¹⁵⁵ it also states that it "firmly oppose[s] their disorderly expansion, unfair competition, data misuse and other violation [sic] of consumer interests."¹⁵⁶

The crackdown on powerful companies and individuals in control of the dominant methods of payment in China underscores an important element of the e-CNY. Although PBOC officials have said they do not intend to compete with WeChat or Alipay, they have in the same breath positioned the e-CNY as a public option payment rail.¹⁵⁷ Should WeChat or Alipay fail or suffer from an outage, the e-CNY could serve as an effective backup that is reliant not on any one individual, but rather on the central government. Beyond market stability, PBOC seems to imply that taking control away from private companies will enhance efforts to improve data privacy via the e-CNY's emphasis on controllable anonymity. This will require shifting the guardians of information attached to payment transactions from corporations to the government.¹⁵⁸

153. See Sam Peach, *Why Did Alibaba's Jack Ma Disappear for Three Months?*, BBC (Mar. 20, 2021), <https://www.bbc.com/news/technology-56448688> [<https://perma.cc/WM83-HQNK>].

154. For more information about the relationship between Alibaba, Ant Group, and Jack Ma, see Jesse M. Fried & Ehud Kamar, *Alibaba: A Case Study of Synthetic Control*, 11 HARV. BUS. L. REV. 279 (2022). Most interestingly, although Jack Ma currently owns less than five percent of Alibaba, he still effectively controls it via his ownership of Ant Group. *Id.* Moreover, through this control mechanism, Ma also has power over business licenses crucial to the operations of Alibaba and Ant Group. *Id.*; see also Wei Shen, *Deconstructing the Myth of the Alipay Drama—Repoliticizing Foreign Investment in the Telecommunications Sector in China*, 36 TELECOMMS. POL'Y 929, 930–33 (2012) (describing generally the variable interest entity ("VIE") structure that has allowed foreign investors to invest in the Chinese tech sector that would otherwise be off-limits to foreign investors).

155. PYMNTS, *China Widens Mobile Payments Antitrust Probe*, PYMNTS.COM (Sept. 24, 2021), <https://www.pymnts.com/antitrust/2021/china-widens-mobile-payments-antitrust-probe/> [<https://perma.cc/N3SA-L6QL>].

156. *Id.*

157. Yangbang Mu Changchun: *Shuzi Renminbi Buyu Weixin Zhifubao Jingzheng* (央行穆长春: 数字人民币不与微信支付竞争) [PBOC's Mu Changchun: e-CNY does not compete with Wechat and Alipay], Xinlang Caijing (新浪财经) [SINA] (Oct. 26, 2020, 1:11 AM), <https://finance.sina.com.cn/china/2020-10-26/doc-iiznezxr8042131.shtml> [<https://perma.cc/8S6L-XYXH>] (describing currency as "essentially a public product"). For a translation of this article, see *Understanding Digital RMB*, CF40 (Nov. 11, 2020), http://www.cf40.com/en/news_detail/11427.html [<https://perma.cc/3VDT-BWXJ>].

158. If one prefers government control of data to private sector control, taking power away from the likes of Alipay represents an improvement. However, government control of personal financial data is at

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Viewed together, China's crackdown on private cryptocurrencies and its enhanced regulatory scrutiny of the private mobile payments space provide important context for interpreting China's plans for the e-CNY. Most importantly, they highlight the important domestic policy motivations behind the e-CNY, with a strong focus on solving domestic problems. Efforts to displace private cryptocurrencies are aimed at eliminating their attendant risks—of criminal activity, of financial risk, and of entities beyond central government control—while furthering the benefits and convenience of modern digital payment systems. The same is true with Jack Ma's fall from grace: government regulators clearly see value in digital payments, but are concerned about what overly-powerful executives within an overly-concentrated market might mean for financial stability and data privacy. A CBDC would allow China to address many of these issues, while still retaining the convenience and efficiency of digital payments. It will be able to establish greater controls over financial flows, and ensure that only PBOC and related government officials—not private entrepreneurs—are in control of core payment networks.

U.S. regulators are not wrong to be wary of the geopolitical implications of a new Chinese CBDC—a topic addressed in the next Part—but these concerns should be informed by the entirety of the domestic Chinese policy context. Failure to do so puts the United States at risk of overcorrecting and taking a more aggressive response than may be warranted, leading to a further deterioration of the U.S.-China relationship.

IV. IMPLICATIONS FOR THE UNITED STATES

Troubled by the speed with which China has rolled out the e-CNY, coupled with the manner in which it could further the goals of an increasingly authoritarian regime, American policy makers have begun evaluating the impact the e-CNY could have on the U.S. economy and the international status quo.¹⁵⁹ Four concerns appear especially pronounced. First, the e-CNY may provide China with the ability to bypass U.S.-controlled cross-border payment networks, thereby weakening the U.S. sanctions regime at the

least as concerning as corporate control, if not more so. While Ant Group may have an incentive to profit from private data, it does not have an interest in broader societal control like that possessed by the Chinese government. See *infra* Section IV.D.

159. See, e.g., Reuters & Jonnelle Marte, *Fed's Powell: China's Approach to Digital Currency Would not Work in U.S.*, REUTERS (Apr. 28, 2021, 3:55 PM), <https://www.reuters.com/business/feds-powell-chinas-approach-digital-currency-would-not-work-here-2021-04-28/> [<https://perma.cc/CJ5M-GSJA>]; Christopher Waller, Member, Bd. of Governors of the Fed. Rsrv. Sys., *Speech at the American Enterprise Institute: CBDC: A Solution in Search of a Problem?* 9 (Aug. 5, 2021); Craig Torres, *Brainard Lays Out Cost Benefits of Central Bank Digital Currency*, BLOOMBERG (May 24, 2021, 9:00 AM), <https://www.bloomberg.com/news/articles/2021-05-24/brainard-lays-out-cost-benefits-of-central-bank-digital-currency> [<https://perma.cc/2TTE-DCNK>].

same time China has introduced a blocking statute and its own sanctions regime as countermeasures. Second, the e-CNY may displace the U.S. dollar as the dominant global currency. Third, the e-CNY may prove to be a revolutionary tool for macroeconomic policy management that fundamentally alters the global balance of economic power, hastening the displacement of the U.S. dollar. Finally, the e-CNY may constitute a dangerous new tool for an increasingly authoritarian regime. This Part evaluates each of these issues in turn. It begins with the e-CNY's impact on the U.S. sanctions regime, which is of the most immediate existential concern. While the other challenges in other areas may prove detrimental to long-term U.S. interests, neutering the sanctions regime would deprive the United States of an important tool it can use to quickly respond to emerging security threats.

A. *Cross-Border Payments & Sanctions*

The issue of greatest existential concern to the United States is the potential that the e-CNY—if interoperable with the CBDCs of other nations¹⁶⁰—would not just eliminate economic sanctions as an effective tool of American foreign policy, but would make certain cross-border financial flows completely unobservable to the U.S. security apparatus. At present, the primary entity responsible for cross-border transactions is the Society for Worldwide Interbank Financial Telecommunication (“SWIFT”), a messaging platform established in 1973 for sending and receiving financial information across national boundaries, rather than for funds settlement.¹⁶¹ Participation in SWIFT does not require a financial institution to have a presence in the United States,¹⁶² though its centrality to cross-border payments means that any financial institution cut off from SWIFT will be unable to transfer financial information across borders. Although SWIFT data was originally intended to be confidential, the U.S. Department of Treasury eventually gained access following 9/11.¹⁶³ The United States can thus monitor all cross-border financial transactions that pass through SWIFT and block

160. As of this writing nine nations have officially launched a CBDC: The Bahamas (which calls its CBDC the “sand dollar”), seven nations in the Eastern Caribbean, and Nigeria. Fourteen others have announced pilot programs. See *Central Bank Digital Currency Tracker*, ATLANTIC COUNCIL, <https://www.atlanticcouncil.org/cbdctracker/> [https://perma.cc/2JQW-X63B].

161. See FEASIBILITY OF A CROSS-BORDER ELECTRONIC FUNDS TRANSFER REPORTING SYSTEM UNDER THE BANK SECRECY ACT 63 (2006). The Clearing House Interbank Payments System (“CHIPS”) also plays an important role in the transmission of funds, transfer instructions, as well as payments settlement between institutions, processing more than 90% of all U.S. dollar-denominated cross-border transfers; however, participation in CHIPS requires the financial institution to have a presence in the U.S. SWIFT is thus a more important entity for sanctions considerations. See *id.* at 61–62.

162. Gorton, *supra* note 61, at 26.

163. See *id.* at 26 & n.47. For an engaging narrative account of the relationship between Treasury and SWIFT, see generally, JUAN C. ZARATE, *TREASURY'S WAR: THE UNLEASHING OF A NEW ERA OF FINANCIAL WARFARE* 49–60 (2013) (describing the origins of the partnership between the U.S. Department of Treasury and SWIFT, recalling the first meeting as follows: “Aufhauser [Treasury General Counsel] brazenly opened the meeting with a declaration: ‘I want your data.’ Without a pause, Schrank [the CEO of SWIFT] responded, ‘What took you so long?’”).

blacklisted entities and nations from participating in SWIFT.¹⁶⁴ As of this writing, a number of Russian entities have been barred from SWIFT.¹⁶⁵

Chinese officials have long rankled at reliance on a U.S.-controlled system and have criticized this practice as “dollar weaponization.”¹⁶⁶ China’s worries have become only more acute in the last several years, as an increasing number of Chinese entities have been added to the sanctions list.¹⁶⁷ While it has grudgingly participated in SWIFT as a necessity for most of the last forty years, China’s broader “reform and opening” initiatives have generally kept the financial services and payment sectors closed to Western businesses.¹⁶⁸ Indeed, senior officials have repeatedly underscored the role that the e-CNY will play in protecting China’s “monetary sovereignty.” Although they do not explicitly state that they intend to skirt U.S. sanctions, they have actively advocated for competitive alternatives to U.S. dollar channels.¹⁶⁹ Recent legislative changes outside of the monetary realm further underscore the political will of Chinese leaders to get out from under the American thumb. For example, recently promulgated laws and regulations impose penalties on entities that comply with U.S. sanctions if compliance harms Chinese consumers or businesses.¹⁷⁰

Significantly, U.S. policymakers seem concerned that a Chinese alternative to SWIFT could result in nuclear war. At a 2019 simulation exercise hosted by the Harvard Kennedy School, U.S. policy makers developed a

164. See Gorton, *supra* note 61, at 26–27 (“In 2014, the United States threatened to exclude Russia from the system altogether, which had a significant negative impact on the Russian ruble.”).

165. See *An Update to Our Message for the SWIFT Community*, SWIFT (Mar. 2, 2022), <https://www.swift.com/news-events/news/message-swift-community> [<https://perma.cc/EUE9-7T2A>] (“[W]e will disconnect seven designated Russian entities (and their designated Russia-based subsidiaries) and three Belarusian entities (and their designated Belarus-based subsidiaries) from the SWIFT network.”); Patricia Kowsmann et al., *West Orders Seven Russian Banks off Swift, but Leaves Others on*, WALL ST. J. (Mar. 1, 2022, 3:31 PM), <https://www.wsj.com/livecoverage/russia-ukraine-latest-news-2022-03-01/card/west-orders-seven-russian-banks-off-swift-but-leaves-others-on-OMv9TCsZMQLze9dQQRm> [<https://perma.cc/C837-FK5B>].

166. Areddy, *supra* note 1.

167. See *id.*

168. Notably, despite agreeing to open its payment sector to foreign credit card operators as a part of its WTO accession, China has stubbornly kept these operators out of the market. This obstinance is informed in part by national security concerns about foreign control of payment networks, and underscored by Russia’s experience in 2014 with Visa and U.S. sanctions. See Doug Palmer & Frank Tang, *China Slow-Walks Opening Country to U.S. Credit Card Companies*, POLITICO (Apr. 2, 2019), <https://www.politico.com/story/2019/04/02/china-us-credit-card-companies-1309803> [<https://perma.cc/4ZBW-FNBA>]; Reuters Staff, *Visa Says Can’t Support Bank Cards in Crimea Due to U.S. Sanctions*, REUTERS (Dec. 26, 2014), <https://www.reuters.com/article/russia-crisis-visa-crimea/visa-says-cant-support-bank-cards-in-crimea-due-to-u-s-sanctions-idUSL6N0UA0UX20141226> [<https://perma.cc/5HQ8-JCSL>].

169. See Robert Greene, *Beijing’s Global Ambitions for Central Bank Digital Currencies Are Growing Clearer*, CARNEGIE ENDOWMENT FOR INT’L PEACE (Oct. 6, 2021), <https://carnegieendowment.org/2021/10/06/beijing-s-global-ambitions-for-central-bank-digital-currencies-are-growing-clearer-pub-85503> [<https://perma.cc/5NYN-88MT>].

170. See *id.* (referencing a Ministry of Commerce “blocking statute” and the recently approved Sanctions Law, the latter providing the government the authority to seize assets of any company that harms Chinese persons through compliance with U.S. sanctions laws); see also *supra* note 133 (citing the Measures to Block the Improper Extraterritorial Application of Foreign Laws and Measures).

response to the hypothetical development of a North Korean nuclear missile secretly funded with e-CNY.¹⁷¹ Nicholas Burns, a participant in the exercise and, interestingly, now U.S. ambassador to China, noted that “the Chinese have created a problem for us by taking away our sanctions leverage.”¹⁷²

Short of hypothetical nuclear disaster, a more likely effect is that an interoperable CBDC network led by the Chinese could present an attractive alternative to SWIFT that undermines U.S. power. Even U.S. allies are frustrated by the overuse of sanctions,¹⁷³ and the SWIFT-centered correspondent banking network is accurately described as slow, expensive, inefficient, and reliant on near-ancient technology to transmit messages.¹⁷⁴ If China is able to pioneer a more efficient system built around CBDCs, U.S. allies may be incentivized to switch from SWIFT. An international pilot system is already underway with participation from China, the United Arab Emirates, Thailand, and Hong Kong,¹⁷⁵ and is intended to reduce the time and cost of cross-border transactions.¹⁷⁶ Although there may be concern that a Chinese-led system might shift allegiances away from the United States,¹⁷⁷ it is not clear that participating nations would necessarily adopt Chinese standards for their own CBDC. Additionally, because an interoperable CBDC mechanism might allow each nation to design its own CBDC, it may not be subject to the pressures faced by other technologies and related standards-setting organizations. For example, China has been extremely active in asserting control over the international organizations responsible for setting standards in cutting-edge technologies like 5G, with the intention of having its standards dominate in third markets.¹⁷⁸

171. HARVARD KENNEDY SCH. BELFER CTR. FOR SCI. & INT’L AFFS, *supra* note 76, at 10.

172. Aredy, *supra* note 1.

173. See *America’s Aggressive Use of Sanctions Endangers the Dollar’s Reign*, ECONOMIST (Jan. 18, 2020), <https://www.economist.com/briefing/2020/01/18/americas-aggressive-use-of-sanctions-endangers-the-dollars-reign> [<https://perma.cc/M4FE-FD9D>].

174. Gorton, *supra* note 61, at 9–10 (“Cross-border payment systems still use message formats developed 100 years ago for the telex machine”).

175. See Press Release, Central Banks of China and United Arab Emirates Join Digital Currency Project for Cross-Border Payments, BANK OF INT’L SETTLEMENTS (Feb. 23, 2021), <https://www.bis.org/press/p210223.htm> [<https://perma.cc/6FBH-CEF4>].

176. See Alun John, *Central Bank Digital Currencies Can Slash Cross Border Payment Time* – BIS, REUTERS (Sept. 28, 2021), <https://www.reuters.com/business/central-bank-digital-currencies-can-slash-cross-border-payment-time-bis-2021-09-28/> [<https://perma.cc/W52R-UPPL>].

177. China has recently stepped up its efforts to bring the United Arab Emirates—a U.S. ally in the Middle East—under its sway. See Gordon Lubold & Warren P. Strobel, *Secret Chinese Port Project in Persian Gulf Rattles U.S. Relations With U.A.E.*, WALL ST. J. (Nov. 19, 2021), https://www.wsj.com/articles/us-china-uae-military-11637274224?modHP_lead_pos3 [<https://perma.cc/L5XS-SHN2>].

178. See, e.g., Daniel R. Russell & Blake H. Berger, *Stacking the Deck: China’s Influence in International Technology Standards Setting*, ASIA SOC’Y POL’Y INST. (Dec. 2021) https://asiasociety.org/sites/default/files/2021-11/ASPI_StacktheDeckreport_final.pdf [<https://perma.cc/QD2A-GLLU>] (describing the “deliberate strategy to increase China’s influence within international standards development organizations” that has allowed Beijing to “significantly enhance[] its ability to gain approval of its own proposals and to resist those that it does not favor”); Valentina Pop et al., *From Lightbulbs to 5G, China Battles West for Control of Vital Technology Standards*, WALL ST. J. (Feb. 8, 2021), <https://www.wsj.com/articles/from-lightbulbs-to-5g-china-battles-west-for-control-of-vital-technology-standards-11612722698> [<https://perma.cc/B479-9B7U>] (“China is promoting standards that would boost exports for companies with

Even though an interoperable system for cross-border CBDC transactions led by China may present serious concerns to the United States, two counter considerations should help policy makers sleep a bit more soundly. First, the e-CNY and its attendant multi-CBDC clearing pilots are not China's first attempt to establish the foundation of an alternative to SWIFT. Rather, China launched the Cross-Border Interbank Payment System ("CIPS") in 2015 to facilitate onshore RMB-denominated transactions with Russia, India, and others.¹⁷⁹ Although CIPS is currently interoperable with SWIFT,¹⁸⁰ CIPS could be used to function separately and outside of the existing network. This alternative network could allow sanctioned entities to make transactions outside of both SWIFT and the watchful eye of U.S. national security agencies.¹⁸¹ However, SWIFT recently established a joint venture with CIPS and China's digital currency research institute,¹⁸² indicating that China is perhaps hesitant to decouple so completely from the established system, at least as of yet.¹⁸³

Second, while an e-CNY might facilitate more efficient flouting of the U.S. sanctions regime, foreign policy and politics—not financial technology alone—are key determinants of whether China decides to violate U.S. sanctions. For China to provide North Korea the ability to finance major improvements in its nuclear weapons program, as in the hypothetical Harvard Kennedy School exercise, it will have had to already accept the cost of potential military conflict with the United States, or at least other non-monetary sanctions such as tariffs or import bans. An interoperable CBDC network might help facilitate such support from other nations, and reduce the cost of skirting U.S. demands. However, if China intends to maintain control of such a network, it would have to make the political decision to allow financing to occur in light of other international pressures.

links to Beijing as well as support its state-security apparatus Chinese officials lead at least four global standards organizations"); Anna Gross et al., *Chinese Tech Groups Shaping UN Facial Recognition Standards*, FIN. TIMES (Dec. 1, 2019), <https://www.ft.com/content/c3555a3c-0d3e-11ea-b2d6-9bf4d1957a67> [<https://perma.cc/V8ZP-YJN7>] ("Chinese technology companies are shaping new facial recognition and surveillance standards at the UN, according to leaked documents obtained by the Financial Times, as they try to open up new markets in the developing world for their cutting-edge technologies.").

179. See Greene, *supra* note 6.

180. See Cameron Rotblat, *Weaponizing the Plumbing: Dollar Diplomacy, Yuan Internationalization, and the Future of Financial Sanctions*, 21 UCLA J. INT'L L. & FOREIGN AFFS. 311, 344 (2017).

181. See *id.* at 345; see also Reuters Staff, *FACTBOX-China's Onshore Yuan Clearing and Settlement System CIPS*, REUTERS (Jul. 30, 2020), <https://www.reuters.com/article/china-banks-clearing/factbox-chinas-onshore-yuan-clearing-and-settlement-system-cips-idUSL3N2F115E> [<https://perma.cc/CY4Z-FSQZ>].

182. Reuters Staff, *SWIFT Sets Up JV with China's Central Bank*, REUTERS (Feb. 4, 2021), <https://www.reuters.com/article/china-swift-pboc/swift-sets-up-jv-with-chinas-central-bank-idUSL1N2KA0AK> [<https://perma.cc/3R58-7HVC>].

183. See *Will Going Digital Transform the Yuan's Status at Home and Abroad?*, ECONOMIST (May 8, 2021), <https://www.economist.com/finance-and-economics/2021/05/06/will-going-digital-transform-the-yuan-status-at-home-and-abroad> [<https://perma.cc/XQ48-WX3W>] (citing a Chinese Academy of Social Sciences academic as noting that "Even in the long term, SWIFT will remain indispensable").

The response to Russia's invasion of Ukraine, in the early stages as of this writing, illustrates the weaknesses of such alternatives. One prominent commentator, discussing the social opprobrium international sanctions represent, notes that:

[T]here are absolutely ways around the hegemony of the dollar (and the euro, pound, yen, Swiss franc, stock and bond markets, SWIFT, etc.) if you want them. Russia can trade with China using yuan, or digital yuan or whatever; Russia can surely do some business with somebody in Bitcoin. Russia can use Bitcoin or yuan or rubles to buy things from people who (1) want to deal with Russia and (2) are willing to accept Bitcoin or yuan or rubles. *The implicit bet of these sanctions is that those people are worse, that the people whom Russia wants to deal with are the ones who trade in dollars or euros or pounds or francs.* The bet of these sanctions is that the dollar represents a society — not just the U.S., but a global community of dollar users — and that that society is reflected in both a set of values that abhors the invasion of Ukraine, and in an economic system that other countries want access to, even if those countries do not share those values. It is a bet that economic power and moral values are connected.¹⁸⁴

In sum, the e-CNY may serve to weaken the efficacy of U.S. sanctions if it leads to an efficient and widely-used alternative to SWIFT. However, foreign policy and political considerations are also important considerations that a new financial technology will not totally displace. Essentially, China needs to consider whether it wishes to totally decouple from the Western financial order, as Russia seems to have accepted, in adopting the e-CNY. The United States should prioritize the modernization of cross-border payment systems so that the U.S.-led system remains the competitive alternative to any Chinese-led system.

B. U.S. Dollar Dominance

The USD has been the dominant reserve currency since World War II and is the preferred medium for international trade; dollars are used in eighty-

184. Matt Levine, *Russia's Money Is Gone*, BLOOMBERG OPINION (Feb. 28, 2022, 6:27 PM), <https://www.bloomberg.com/opinion/articles/2022-02-28/russia-s-money-is-gone> [<https://perma.cc/FP5H-Z7VV>] (emphasis added). However, it may be the case that Russia—or Putin, at least—has already decided to accept the cost of Western sanctions, and in fact has no desire to deal with the ones who trade in dollars or euros or pounds or francs. See Max Fisher, *Putin, Facing Sanction Threats, Has Been Saving for This Day*, N.Y. TIMES (Feb. 3, 2022), <https://www.nytimes.com/2022/02/03/world/europe/putin-sanctions-proofing.html> [<https://perma.cc/GT3N-XNTY>] (“Over the past several years, Mr. Putin, Russia’s president, has restructured his country’s economy for the specific purpose of withstanding Western financial pressure.”).

eight percent of foreign exchange transactions.¹⁸⁵ Its strength derives in part from its perception as a safe and reliable store of value.¹⁸⁶ Because more than sixty percent of all foreign exchange reserves are held in USD, there is strong demand for USD, which in turn allows the United States to borrow more cheaply than it otherwise would be able to.¹⁸⁷ The RMB, on the other hand, constitutes just four percent of international foreign exchange trades,¹⁸⁸ and just two percent of foreign exchange reserves.¹⁸⁹

The concern that the RMB will displace the USD is not new, with some commentators believing that it is a matter of when—not if—the RMB becomes more powerful than the USD.¹⁹⁰ The e-CNY has sparked additional concerns among Biden Administration officials that a cheaper and more efficient cross-border payment system centered on the e-CNY could further the internationalization of China's currency at the USD's expense.¹⁹¹ By positioning itself as a competitive alternative to the USD, demand for the e-CNY could reduce the USD's role in international foreign exchange trade and perhaps as a global reserve currency. This would reduce demand for USD reserves, increase the cost of borrowing for the US, and make it much more difficult for the United States to maintain such extreme budget deficits.¹⁹²

Even if the USD were not to be entirely displaced, the e-CNY could make inroads as tool for facilitating intra-regional trade. Other central banks exploring CBDCs have been quite explicit about the desirability of such a functionality. For example, the Central Bank of Trinidad and Tobago recently proposed using a CBDC to facilitate regional trade in the Caribbean, with particular value in “eliminating the need to go through the US dollar

185. Carol Bertaut et al., *The International Role of the U.S. Dollar*, FEDS NOTES (Oct. 6, 2021), <https://www.federalreserve.gov/econres/notes/feds-notes/the-international-role-of-the-u-s-dollar-20211006.htm> [<https://perma.cc/4PM7-G9GQ>].

186. See Rebecca M. Nelson et al., *The U.S. Dollar as the World's Dominant Reserve Currency*, CONG. RSCH. SERV. (Dec. 18, 2020), <https://crsreports.congress.gov/product/pdf/IF/IF11707> [<https://perma.cc/H3E2-EFTU>].

187. *Id.*

188. Areddy, *supra* note 1.

189. See Statement from Martin Chorzempa, Senior Fellow, Peter G. Peterson Inst. for Int'l Econ., Testimony Before the US-China Economic and Security Review Commission, Panel 4: China's Pursuit of Leadership in Digital Currency (Apr. 15, 2021).

190. See, e.g., David P. Goldman, *Digital Yuan Could Bust the United States*, ASIA TIMES (Feb. 6, 2021), <https://asiatimes.com/2021/02/digital-yuan-could-bust-the-united-states/> [<https://perma.cc/XP5K-4GBB>] (“When – and the issue is when rather than if – China’s currency assumes a world status commensurate with its economic standing, the dollar’s reserve role will fade like the pound sterling before it, and the United States will have to learn to spend within its means.”)

191. See Mohsin, *supra* note 103. As of this writing, the Fed has not yet published a long-anticipated white paper explaining its views on the issuance of a U.S. CBDC. See Jonnelle Marte, *Fed to Release Paper on Central Bank Digital Currency Soon, Powell Says*, REUTERS (Sept. 22, 2021), <https://www.reuters.com/business/fed-release-paper-central-bank-digital-currency-soon-powell-says-2021-09-22/> [<https://perma.cc/5ALK-CH4R>].

192. See Goldman, *supra* note 187.

as the vehicular currency.”¹⁹³ China has already established regional trade roots via the Regional Comprehensive Economic Partnership and the Belt and Road Initiative; although it has not stated its desire to shut out the U.S. dollar as the medium of exchange as explicitly as Trinidad & Tobago, the potential is obvious.¹⁹⁴

However, the U.S. dollar has had challengers before, and marginal gains in the efficiency of cross-border payments are unlikely to make up for the numerous other reasons that the e-CNY—like the RMB before it—is unlikely to displace the USD. Three factors influence whether a currency can attain international status: economic weight, the openness and depth of financial markets, and the strength of economic and legal institutions.¹⁹⁵ While China’s economic weight has certainly increased over the past 40 years, the latter two factors work against China and are unlikely to change any time soon.

First, China’s financial markets are neither open nor deep. It maintains strict capital controls, in part to prop up the value of the RMB, and in part to prevent domestic investors from using their funds overseas in ways inconsistent with the national interest.¹⁹⁶ The depth of financial markets is also an issue: China’s stock and bond markets are still in the process of maturing and remain risky, and as a result, there are few attractive investment opportunities for Chinese nationals beyond real estate.¹⁹⁷ Even if international investors were tempted by Chinese assets, the difficulty of moving resulting earnings out of China remains a significant disincentive.¹⁹⁸ The e-CNY

193. Kevin Finch et al., *CARIBBEAN CURRENCY CONVERTIBILITY IN AN ERA OF CENTRAL BANK DIGITAL CURRENCY*, CENT. BANK OF TRIN. & TOBAGO 24 (2021).

194. See *Digital Yuan’s Currency Statecraft*, GLOB. COUNS. (Aug. 18, 2021), <https://www.global-counsel.com/insights/blog/digital-yuans-currency-statecraft> [<https://perma.cc/J6VF-VSEK>] (noting that e-CNY “interoperability between [the Regional Comprehensive Economic Partnership] and [Belt and Road Initiative] partners could encourage its uptake in these economies and further empower China to leverage its trading, investment, and financing capabilities to compete for political influence against the US and its allies in the region and beyond.”).

195. See Chorzempa, *supra* note 8, at 111.

196. See Yawen Chen & Elias Glenn, *China’s Overseas Property Purchases, Investments Slump as Capital Controls Bite*, REUTERS (Feb. 15, 2017), <https://www.reuters.com/article/us-china-economy-fdi/chinas-overseas-property-purchases-investments-slump-as-capital-controls-bite-idUSKBN15V0DB> [<https://perma.cc/5WK6-TNA4>].

197. Mike Bird, *China’s Digital Yuan Poses No Threat to the Dollar’s Dominance*, WALL ST. J. (Apr. 19, 2021), <https://www.wsj.com/articles/chinas-digital-yuan-poses-no-threat-to-the-dollars-dominance-11618825750> [<https://perma.cc/K6TU-HMVC>]. To illustrate further, real estate currently accounts for around seventy percent of household wealth in China, in part because Chinese citizens lack alternative investment options. See Jennifer Pak, *In China, It’s Heads for a Real Estate Win, or “Rotten Tails” – You Lose*, MARKETPLACE (May 10, 2021), <https://www.marketplace.org/2021/05/10/real-estate-important-gamble-china/> [<https://perma.cc/79US-T5WK>].

198. This may be something of an overstatement, as China has recently relaxed foreign investment restrictions for major institutional investors, and many major American investment firms want exposure to the Chinese market; the likes of Goldman Sachs and J.P. Morgan are no longer required to maintain joint ventures with Chinese partners. See Quentin Webb, *Goldman Sachs Cleared to Own All of China Unit*, WALL ST. J. (Oct. 18, 2021), <https://www.wsj.com/articles/goldman-sachs-cleared-to-own-all-of-china-securities-unit-11634524579> [<https://perma.cc/L9V8-3HSZ>]; see also Russell Napier, *China’s Rising Vulnerability to Foreign Investors*, FIN. TIMES (Dec. 1, 2021), <https://www.ft.com/content/7a1cbb0e-ab57->

could remedy this issue to some extent if it allows more precise capital controls. For instance, the programmable nature of digital currency and variable permissions associated with wallets could allow accounts associated with certain international investors to more easily move funds in and out of the country without having to wait in line at the foreign exchange bureau.

Even if the e-CNY sufficiently resolves issues about the openness and depth of China's financial markets, China's legal institutions are too unpredictable for foreign investors to confidently hold large stores of value in e-CNY. The degree of centralized control over e-CNY wallets coupled with the tendency of Chinese bureaucrats to have their "feelings hurt"¹⁹⁹ only exacerbates these concerns. Investors might enjoy the ability to freely move e-CNY in and out of China one day, only to wake up the next day and find that their account has closed because of a stray favorable utterance about the Dalai Lama. President Xi's heavy-handed approach to the development of "socialist rule of law with Chinese characteristics," which emphasizes the interests of the Communist Party above all others,²⁰⁰ might outweigh any efficiency to be gained by using the e-CNY.

Thus, while the e-CNY may make incremental efficiency gains at the margins of the financial system, China's other institutional weaknesses—a closed capital account, a dearth of high-quality assets, finicky leadership, and unreliable legal institutions—make it much less likely that the e-CNY will seriously displace the U.S. dollar any time soon.²⁰¹

4092-ba33-b231fc1b1783 [https://perma.cc/WE9R-GQX3] ("For the first time foreigners have a large enough position in renminbi-denominated securities to influence Chinese monetary policy."). However, capital controls remain strict, and are subject to the whims of economic policymakers, so the ability of foreign investors to withdraw their capital remains uncertain. See Frank Tang & Siqi Ji, *China Extends Battle Lines to Manage Capital Outflows as Beijing Doubles Down on 'Economic Security'*, S. CHINA MORNING POST (Dec. 1, 2021), <https://www.scmp.com/economy/china-economy/article/3158048/china-extends-battle-lines-manage-capital-outflows-beijing> [https://perma.cc/HAW4-QS5S]; Erin Ennis & Jake Laband, *China's Capital Controls Choke Cross-Border Payments*, US-CHINA BUS. COUNCIL (Mar. 10, 2017), <https://www.uschina.org/china%E2%80%99s-capital-controls-choke-cross-border-payments> [https://perma.cc/G2ZY-CKL9].

199. Those who have allegedly "hurt the feelings of the Chinese people" include Pope John Paul II, President Obama, Angelina Jolie, and the Marriott hotel management group. See *Hurting the Feelings of the Chinese People*, WIKIPEDIA.ORG, https://en.wikipedia.org/wiki/Hurting_the_feelings_of_the_Chinese_people [https://perma.cc/H4VD-G2NP].

200. See generally Jamie Horsley, *Party Leadership and Rule of Law in the Xi Jinping Era*, BROOKINGS (Sept. 2019, 2020), <https://www.brookings.edu/research/party-leadership-and-rule-of-law-in-the-xi-jinping-era/> [https://perma.cc/TT9T-BXHW].

201. Moreover, despite official pronouncements of a desire to internationalize the RMB, China has expressed no interest in assuming the balance of payments deficit that would be required to allow its currency to become an international reserve currency. Whether such deficit is a burden or a privilege for the U.S.—which runs a massive current account deficit as the provider of a global reserve currency—is a matter of debate. See, e.g., Ben Bernanke, *The Dollar's International Role: An "Exorbitant Privilege"?*, BROOKINGS (Jan. 7, 2016), <https://www.brookings.edu/blog/ben-bernanke/2016/01/07/the-dollars-international-role-an-exorbitant-privilege-2/> [https://perma.cc/V CJ4-P6QH] (valuating the various costs and benefits of having the USD as a global reserve currency); Michael Pettis, *Are We Starting to See Why It's Really the Exorbitant "Burden"*, CARNEGIE ENDOWMENT FOR INT'L PEACE (Oct. 5, 2014), <https://carnegieendowment.org/chinafinancialmarkets/56856> [https://perma.cc/D2ZE-PYKS] (arguing that having the USD serve as a global reserve currency is actually "a destabilizing burden rather than an 'exorbi-

C. *Revolutionary Macroeconomic Policy*

Whatever weaknesses the e-CNY may have internationally, it holds the potential to dramatically strengthen China's domestic macroeconomic policy in two ways: real-time economic insight and precise macroeconomic management. If successful, China could supercharge economic development and wellbeing, perhaps challenging the presumed superiority of laissez-faire market systems relied upon by advanced industrial economies, thereby undermining the dominance of the U.S. dollar as discussed in the preceding Section.

First, it would allow real-time visibility into consumer and business spending habits that will provide an enhanced barometer for overall economic performance. This clearer picture would allow for a more confident analysis of economic activity, and conceivably more accurate policy prescriptions for problems that arise. The PBOC White Paper does not directly address such a goal, and indeed mentions that it primarily intends to keep the e-CNY as M_0 .²⁰² However, President Xi has clearly and repeatedly emphasized the goal of leveraging big data to benefit China's development.²⁰³ Although economists elsewhere are similarly enticed by the possibility of such precise control,²⁰⁴ China is not constrained by scruples like individual privacy or liberties that might restrict the use of these tools elsewhere.

Second, China will be able to react to this real-time information with precisely-tailored prescriptions enabled by the programmable nature of digital currencies. For example, China's economic planners could issue digital stimulus checks and use smart contracts to ensure that the funds be used only in those sectors of the economy in greatest need of stimulation. Once that sector of the economy has been sufficiently boosted—based on real-time information—the stimulus payments could expire, or be directed to other uses. China's state-owned banks have been ordered to direct credit to certain sectors in the past, but these heavy-handed methods were imprecise and resulted in serious overcapacity issues that negatively impacted international

tant privilege'"). Either way, given China's closed-off capital account, it does not seem interested in the responsibility such burden or privilege would entail.

202. M_0 is a measure of money supply that refers to the total amount of currency (paper and coin) either in general circulation in public, or in the form of bank deposits held at the central bank. See James Chen, *Monetary Base*, INVESTOPEDIA (Mar. 9, 2021), <https://www.investopedia.com/terms/m/monetarybase.asp> [<https://perma.cc/P5TL-H5LW>].

203. See Matt Pottinger & David Feith, *Opinion: The Most Powerful Data Broker in the World Is Winning the War Against the U.S.*, N.Y. TIMES (Nov. 30, 2021), <https://www.nytimes.com/2021/11/30/opinion/xi-jinping-china-us-data-war.html> [<https://perma.cc/2KYC-E2BX>] (quoting President Xi as stating in 2013, "[t]he vast ocean of data, just like oil resources during industrialization, contains immense productive power and opportunities. Whoever controls big data technologies will control the resources for development and have the upper hand").

204. A recent edition of *The Economist* discussed the impending "real-time revolution" in economics. *A Real-Time Revolution Will Up-End the Practice of Macroeconomics*, ECONOMIST (Oct. 23, 2021), <https://www.economist.com/leaders/2021/10/23/a-real-time-revolution-will-up-end-the-practice-of-macroeconomics> [<https://perma.cc/YQJ2-ETHR>].

markets.²⁰⁵ The e-CNY would allow for scalpel-like precision, reducing externalities from sledgehammer-like tailoring of previous stimulus efforts.

Chinese policymakers themselves might suggest caution on this point,²⁰⁶ and are wary of displacing the private sector entirely—one former adviser to the PBOC noted that “[w]e don’t want to go back to central planning. That would be a mistake.”²⁰⁷ However, as discussed above, Chinese leaders would at a minimum be glad to claw back some power from the big tech firms.²⁰⁸ Furthermore, although 20th century centralized economic planning failed, much to the advantage of the United States, the e-CNY—should it prove to be an effective macroeconomic tool—could vindicate China’s version of the Marxist thesis and call into question the underpinnings of the capitalist system of advanced industrialized economies. Even if policymakers refrain from taking a fully Maoist approach to economic planning, the e-CNY could allow for the market to generally allocate resources, with more precise government intervention when markets fail.

On the other hand, perhaps U.S. policy makers need not worry about their model of macroeconomic regulation falling into obsolescence just yet. While common sentiment on both sides of the Pacific may be that tech firms should be more vigorously regulated,²⁰⁹ China runs the risk of overcorrecting and destroying the private sector as an important engine of growth and innovation. The e-CNY may indeed present opportunities for greater precision, but “dynamic economies rely not on Big Brother but on the spontaneous behavior of millions of independent firms and consumers.”²¹⁰ Furthermore, such economic control risks making policy makers overconfident; plenty of macroeconomic decisions might be made correctly, but one misstep could have catastrophic consequences not just for China’s economy, but for that of the world.

In sum, if the e-CNY proves to be a new and powerful macroeconomic tool, the resulting rise of powerful and effective central planning could shift

205. See, e.g., Andrew Batson, *Stimulus-Driven Overcapacity in China Could Swamp World Markets*, *Says Group*, WALL ST. J. (Nov. 27, 2009), <https://www.wsj.com/articles/SB125920183074064831> [<https://perma.cc/W95H-FQXL>] (referencing an E.U. Chamber of Commerce report stating that “a combination of easy credit and other incentives for Chinese companies to expand has led to the construction of many new factories in areas like steel, aluminum, cement and chemicals. The increase in industrial capacity – at a time of global economic weakness – could drive down profit margins worldwide and lead to a backlash from other countries”).

206. See *Will Going Digital Transform the Yuan’s Status at Home and Abroad?*, *supra* note 103 (“Within China, however, many economists are far less bullish. . . . ‘The digital yuan is not magic, so we don’t expect magic from it,’ says Gary Liu of the China Financial Reform Institute in Shanghai.”).

207. See *id.* (quoting Yu Yongding); see also *supra* Section IV.B.

208. See Scott Murdoch & David Stanway, *China Fines Alibaba Record \$2.75 Bln for Anti-Monopoly Violations*, REUTERS (Apr. 9, 2021), <https://www.reuters.com/business/retail-consumer/china-regulators-fine-alibaba-275-bln-anti-monopoly-violations-2021-04-10/> [<https://perma.cc/GAD7-WW8M>].

209. See The Saturday Essay, *How to Fix Social Media*, WALL ST. J. (Oct. 29, 2021), <https://www.wsj.com/articles/how-to-fix-social-media-11635526928> [<https://perma.cc/7CLK-8FU9>] (containing essays from such divergent voices as Senators Klobuchar and Hawley on the need to regulate big tech).

210. See *A Real-Time Revolution Will Up-End the Practice of Macroeconomics*, *supra* note 201.

the center of economic gravity from the West to the East. This would exacerbate the decline of the U.S. dollar's dominance in international trade. Or, alternatively, it could further underscore the importance of competitive market capitalism to a healthy and vibrant society.

D. *Authoritarian Tool for Societal Control*

Although real-time visibility into economic transactions may have some macroeconomic upsides, it could significantly increase China's ability to surveil its people. Should its system gain acceptance internationally, other nations could also surveil their citizenry. To the extent that the United States is concerned with promoting individual liberty and civil rights internationally, such consequences would constitute a major ideological defeat.

As noted above, the programmable nature of the e-CNY wallet puts users at risk of having their accounts closed should they fall out of favor with regulators. This risk is particularly acute for potential dissidents or activists in China. Moreover, some commentators have speculated whether centralized control could allow the government to automatically extract fines if some infraction has been committed, without any judicial recourse.²¹¹ China has already demonstrated the willingness to impose such draconian systems, as illustrated by its Social Credit System.²¹² Conceivably, China could also export such systems to other nations. If the e-CNY or similar Chinese-led system gains international acceptance—as is possible among participants in the Belt and Road Initiative—any nation that adopts it will obtain similar capabilities.

However, even if the e-CNY does allow such surveillance, it may not represent much of a change over China's current abilities. As the *Economist* notes, mobile payments are already processed through NetsUnion, a centralized clearing platform that provides regulators real-time visibility into transactions.²¹³ Further, it seems unlikely that government regulators cannot already demand information about or effectively shut down individual bank accounts, should they so desire.

211. See Aredy, *supra* note 1.

212. See Jake Laband, *How Can Individuals, Companies be Limited by Bad Social Credit in China?* CHINA BUS. REV. (Feb. 3, 2017), <https://www.chinabusinessreview.com/how-can-individuals-companies-be-limited-by-bad-social-credit-in-china/> [<https://perma.cc/JX5R-PTN2>]. China's Social Credit System is a popular discussion point for those concerned about China's authoritarian tendencies, and is also a common theme in assessing the motivations behind the e-CNY. See, e.g., Yaya J. Fanusie & Emily Jin, *China's Digital Currency—Adding Financial Data to Digital Authoritarianism*, CENTER FOR A NEW AMERICAN SECURITY (Jan. 26, 2021), <https://www.cnas.org/publications/reports/chinas-digital-currency> [<https://perma.cc/Y4GD-3MR9>] (noting that the e-CNY “will likely enable the Chinese Communist Party (CCP) to strengthen its digital authoritarianism domestically and export its influence and standard-setting abroad.”). As important as this particular domestic policy item may or may not be to understanding the e-CNY, this Paper generally leaves that discussion to others. Rather, it recognizes that though PBOC officials may be members of the CCP, they are also motivated by concerns shared by financial regulators elsewhere: financial crime, fraud, systemic risk, and economic stability.

213. See *Will Going Digital Transform the Yuan's Status at Home and Abroad?*, *supra* note 103.

Ultimately, the shift to the e-CNY will constitute a shift from private guardianship of personal financial data to government guardianship. Naively, perhaps, the potential remains that the e-CNY could represent an improvement for individual privacy, at least relative to private firms' current visibility into personal information. The PBOC White Paper emphasizes its desire to promote "managed anonymity." Taking this statement at face value, this could represent an improvement over the status quo by eliminating the power of private fintech firms to peer into and profit from individuals' transaction histories. If the Chinese government does in fact insist on instituting a system that respects individual privacy, perhaps individuals will be better off.²¹⁴

However, there is reason to be skeptical. Ant Group, and fintech firms generally, have an incentive to derive profits from the personal financial data they accumulate; they are also incentivized to adequately protect that data lest consumers lose faith in the ability of any particular institution to safeguard their information. The Chinese government, however, has a much broader interest in using accumulated financial information to enhance societal control. Government guardianship of personal financial information might reduce data leakage to third parties, but it is unlikely to lead to greater privacy or individual liberty for those using the e-CNY.

In the event that the e-CNY remains a domestic project, and its standards are not exported as the basis for other CBDCs, China's ability to surveil its own citizens only indirectly impacts U.S. interests in promoting civil liberties abroad. However, should the underlying technology be widely adopted by other governments, or if large numbers of American citizens use the e-CNY, the implication for U.S. interests becomes more direct.

CONCLUSION

This Note evaluates the design of China's CBDC and potential impacts upon the United States and the international status quo. It proceeds by introducing the concept and potential design elements of CBDCs generally, and then analyzes the design of China's CBDC based on the authoritative PBOC White Paper. It then situates the e-CNY within China's broader domestic policy initiatives—prohibiting private cryptocurrencies and cracking down on private payment platforms—to examine domestic motivations driving the implementation of the e-CNY. These factors show that, although there are clearly international aspirations behind the e-CNY, China's

214. China has taken legislative and regulatory steps to protect Personally Identifiable Information (PII), and have fined tech companies for abusive use of consumer data. See Josh Horwitz, *China Passes New Personal Data Privacy Law, to Take Effect Nov. 1*, REUTERS (Aug. 20, 2021), <https://www.reuters.com/world/china/china-passes-new-personal-data-privacy-law-take-effect-nov-1-2021-08-20/> [https://perma.cc/LNK5-MYMB] (referencing the passage of the Personal Information Protection law, the Data Security law, and regulatory action from the Cyberspace Administration of China, the State Administration for Market Regulation, and the Ministry of Industry and Information Technology).

regulators are also driven by important domestic factors. Namely, China's policymakers also aim to crack down on financial crime and illegal gambling, reassert control over outbound capital flows, and address an increasingly concentrated market of private sector payments platforms. If widely used, the e-CNY will allow China to limit the downsides of a virtual currency administered by private entities, while still retaining the benefits of its present digital payment technologies.

This is not to say that China's goals are solely domestic—they are not. China's leaders intend to develop strong internal strengths to bolster their standing in the world. As such, the domestic policy context is imperative to understanding the international significance of the e-CNY. This Note identifies four areas of concern to the United States and the international status quo.

First, the e-CNY may serve to marginally weaken the efficacy of the U.S. economic sanctions regime, especially if a Chinese-led system becomes a widely-adopted alternative to SWIFT. Second, the e-CNY may displace the U.S. dollar as the dominant global currency. Third, the e-CNY may prove to be a revolutionary tool for macroeconomic policy management that fundamentally alters the global balance of economic power, further accelerating the displacement of the U.S. dollar. Fourth, the e-CNY may represent a dangerous new tool for an increasingly authoritarian regime that could damage American values.

In sum, a Chinese-led international system of CBDCs may present a challenge to the United States if thoroughly integrated into the international system. However, financial technology is but one consideration among many, and any gains may be marginal. Politics and ideology remain important determinants of the global balance of power, and new financial technology will not overpower those factors overnight. Regardless, the United States and its allies should prioritize the modernization of cross-border payment systems so that the U.S.-led system remains an attractive alternative to any Chinese-led system.

