GLOBAL STABLECOINS AND CHINA'S CBDC: NEW MONEYS WITH NEW IMPACTS ON THE FINANCIAL SYSTEM?*

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Abstract

Digital currencies are reshaping the financial, monetary, and regulatory landscape. There are at least two routes for the development of digital currencies. One is global stablecoins (e.g., Diem that is previously named Libra), issued by private players, while the other is central bank digital currency (CBDC) issued by central banks, with China's CBDC as an example and possibly the first CBDC that will be issued by a major economy. Albeit in their rudimentary stages, global stablecoins and China's CBDC are likely to disrupt the current financial system and challenge existing financial regulation. This article examines two crucial but under-explored questions: what are the approaches of global stablecoins and China's CBDC, and their impact on financial regulation? Based on comparative analysis, this Article argues that global stablecoins and China's CBDC would have impacts on macroeconomic (in)stability, the regulation of global stablecoin, and the international monetary order.

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I. Introduction

The COVID-19 epidemic has increased the demand for liquidity, reinforcing the legitimate foundation for digital currencies, which consist of private cryptocurrencies and central bank digital currency (CBDC).[1] Bitcoin and global stablecoins like Diem[2] (formerly known as Libra[3]) are representative private cryptocurrencies that utilize new financial technologies and disrupt finance. Disruption to finance brought mainly by new financial technologies has the benefit of lowering costs in payments, "potentially democratizing finance" with wider access to the financial system and enhancing the speed and

[1] *See* IMF, *IMF COVID-19 Response—A New Short-Term Liquidity Line to Enhance the Adequacy of the Global Financial Safety Net*, Policy Papers 1,2 (Apr. 2020) ("The COVID-19 pandemic has created severe disruption in the global financial system, with many emerging markets and developing countries (EMDCs) facing liquidity shortages.").

[2] The terms of Libra and Diem are used interchangeably in this article.

[3] Jason Brett, *Facebook's Libra Renamed to Diem Prior to Stablecoin Launch* (2020), *available at* https://www.forbes.com/sites/jasonbrett/2020/12/02/facebooks-libra-renamed-to-diem-prior-to-stablecoin-launch/?sh=6978283726e7.

verifiability of settlement of transactions.[4] However, cryptocurrencies also bring challenges and risks such as Bitcoin's severe price volatility. Differing from generic cryptocurrencies like Bitcoin, stablecoins endeavour to address issues particularly price volatility.[5] However, "stable" is mainly "a marketing term."[6] Stablecoins' performance is yet to be seen. Without proper regulation, one may face "under-reserved 'wildcat stablecoins' and a race to the bottom on consumer protection."[7] There are at least two kinds of stablecoins: (i) collateralised stablecoins, with value that is usually tied to underlying assets (e.g., fiat currency, commodities, securities, or real estate),[8] and (ii) algorithmic stablecoins that endeavour to reduce the price fluctuation through algorithms (by "controlling the supply of coins, implemented by an autonomous consensus mechanism and smart contracts") instead of reserves.[9] Diem is closer to a collateralised stablecoin. Accordingly, unless otherwise indicated, stablecoins in this Article refer to collateralised stablecoins, rather than algorithmic stablecoins. Essentially, stablecoins are privately issued cryptocurrencies and are redeemable for, or backed by, assets "having intrinsic value"[10] (also called reference assets[11]).

Crucially, there are two emerging and major paths of digital currencies that are underexplored. They are important for the digitalization of the society, both domestically and internationally. One is global

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[4] ESWAR S. PRASAD, THE FUTURE OF MONEY: HOW THE DIGITAL REVOLUTION IS TRANSFORMING CURRENCIES AND FINANCE 8 (Belknap Press. 2021).

[5] Chris Davis, *Stablecoins*, BENZINGA (Aug. 20, 2021), https://www.benzinga.com/money/best-stablecoins-and-4-types-of-stablecoins/ [https://perma.cc/MD28-YUPD] ("The stablecoin is a low volatility version of cryptocurrency.")

[6] FINMA, FINMA, *Supplement to the Guidelines for Enquiries Regarding the Regulatory Framework for Initial Coin Offerings (ICOs)* (2019), *available at* https://finma.ch/en/news/2019/09/20190911-mm-stable-coins/.

[7] Christian Catalini & Jai Massari, *Stablecoins and the Future of Money* (2021), *available at* https://hbr.org/2021/08/stablecoins-and-the-future-of-money.

[8] FINMA, FINMA, *FINMA Publishes 'Stable Coin' Guidelines*(2019), *available at* https://finma.ch/en/news/2019/09/20190911-mm-stable-coins/.

[9] Yang Ji & Yan Shen, *Introduction to the Special Issue on Digital Currency*, CHINA ECONOMIC JOURNAL 1, 1 (2021).

[10] Steven L. Schwarcz, *Regulating Digital Currencies: Towards an Analytical Framework*, DUKE LAW SCHOOL PUBLIC LAW & LEGAL THEORY SERIES NO. 2021-09 1, 1, 6 (2021).

[11] *See* Jess Cheng, *How to Build a Stablecoin: Certainty, Finality, and Stability Through Commercial Law Principles*, 17 BERKELEY BUSINESS LAW JOURNAL 320, 322, 324 (2020).

stablecoins such as Diem. Libra was proposed in 2019, and its white paper 2.0 was issued in April, 2020.[12] The white paper 2.0 highlights the "transformative potential of cryptocurrencies." [13] Diem has undergone significant changes in its design. To illustrate, Diem has withdrawn its 2020 application for a payment system license from Swiss Financial Market Supervisory Authority (FINMA) and plans to "launch the payment system from the USA in a first phase because initially the project will focus on the USA as its target market and because it is now based on the US currency."[14] Diem Association has moved to the U.S., and Diem is expected to be launched soon.[15] This dollar stablecoin will be Diem's first pilot project.[16] It was planned that Diem is to offer single-currency stablecoins (backed by national fiat currencies) and the multi-currency coins (backed by a basket of national currencies),[17] and that Novi (formerly Calibra) would be built as a new digital wallet for the Diem payment system.[18]

Diem is one among several global stablecoins that have the potential to revolutionize the international monetary system, since they differ from government-issued currencies and could even be considered as reserve currencies if they receive mass adoption around the world.[19] A global stablecoin is a stablecoin "with a potential reach and adoption across multiple jurisdictions and the potential to achieve substantial

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[12] *See* Libra, *Libra White Paper v2.0*, (2020).

[13] PRASAD, 9. 2021.

[14] Press Release, FINMA, *Diem Withdraws Licence Application in Switzerland* (2021), *available at* https://www.finma.ch/en/news/2021/05/20210512-mm-diem/.

[15] *See* James Eyers, *Facebook's Crypto Launch Is Just Months Away*(2021), *available at* https://www.afr.com/companies/financial-services/facebook-s-plan-to-beat-the-global-banks-20190618-p51yqy. [https://perma.cc/SSZ2-6KC7] (observing that Diem has moved to the US and will be launched soon).

[16] *See* Nikhilesh De, *Facebook-Backed Diem Partners With Silvergate Bank to Issue US Dollar Stablecoin* (2021), *available at* https://www.coindesk.com/facebook-backed-diem-partners-with-silvergate-bank-to-issue-us-dollar-stablecoin.(observing that the Silvergate dollar stablecoin will be Diem's first pilot project to launch).

[17] *See* Libra, 1 (2020);Gary B. Gorton & Jeffery Y. Zhang, *Taming Wildcat Stablecoins*, 1, 12 (2021).

[18] Novi, *Frequently Asked Questions* (2021), *available at* https://www.novi.com. [https://perma.cc/96B6-PQRF] (stating that Novi can be used to keep Diem digital currencies in Novi's digital wallet).

[19] Schwarcz, DUKE LAW SCHOOL PUBLIC LAW & LEGAL THEORY SERIES NO. 2021-09, 8 (2021). ("[S]tablecoins have even greater potential than CBDC to revolutionize the monetary system.").

volume."[20] With its development overseen by Diem Association,[21] it was expected that Diem would likely substantially impact the financial market that it could become "the first stablecoin with such breathtaking global reach and utility."[22] This potential reach, evinced by the number of Facebook users, would probably make Diem "a dominant form of digital payment".[23] For instance, Diem might reduce the reliance on traditional banking in international remittance and play an important role in cross-border payments and remittances.[24] Diem "imparts urgency to the debate over what form money can take, who or what can issue it, and how payments can be recorded and settled," and global stablecoins have actually intensified the interest in CBDCs.[25] Although Diem group's assets was sold to Silvergate,[26] the previous and influential development of Diem provides an useful perspective to understand global stablecoins. For one thing, Diem was highly influential in international finance and in fact led to the faster pace of central banks in developing CBDCs.

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[20] FIN. STABILITY BD., REGULATION, SUPERVISION AND OVERSIGHT OF "GLOBAL STABLECOIN" ARRANGEMENTS. (2020).

[21] *See* Ryan Browne, *Facebook-Backed Crypto Project Diem Abandons Swiss License Application, Will Move to the U.S.* (2021), *available at* https://www.cnbc.com/2021/05/12/facebook-backed-diem-is-moving-from-switzerland-to-the-us.html. [https://perma.cc/MKL6-FF75].

[22] Dirk A. Zetzsche, et al., *Regulating LIBRA: The Transformative Potential of Facebook's Cryptocurrency and Possible Regulatory Responses*, UNIVERSITY OF NEW SOUTH WALES LAW RESEARCH SERIES UNSWLRS 19-47, 4 (2019).

[23] Reuters Staff, *China Says New Digital Currency Will Be Similar to Facebook's Libra*(2019), *available at* https://www.reuters.com/article/us-china-cryptocurrency-cenbank/china-says-new-digital-currency-will-be-similar-to-facebooks-libra-idUSKCN1VR0NM.https://perma.cc/3RBT-NYF2] ("[Diem] has sparked concerns among global regulators that it could quickly become a dominant … channel for money laundering given the social network's massive cross-border reach.").

[24] Douglas W. Arner, *Keynote Address—The Empire Strikes Back?: Bitcoin, Libra, COVID-19, and Central Bank Digital Currencies*, 51 CALIFORNIA WESTERN INTERNATIONAL LAW JOURNAL 241, 247 (2021). ("It was launched to deal with challenges in cross-border payments and particular costs associated with remittances.").

[25] Lael Brainard, *Digital Currencies, Stablecoins, and the Evolving Payments Landscape* (2019), *available at* https://www.federalreserve.gov/newsevents/speech/files/brainard20191016a.pdf.

[26] Diem, *Statement by Diem CEO Stuart Levey on the Sale of the Diem Group's Assets to Silvergate*, (2022).

The other path is CBDC, which is the digital form of fiat currency.[27] Due to the COVID-19 epidemic, some central banks are planning to issue CBDC earlier than expected.[28] This is the case with the People's Bank of China (PBOC), China's central bank.[29] China's CBDC, also called e-CNY, the Digital Currency/Electronic Payment (DC/EP), digital yuan, or e-RMB,[30] is "at the most advanced stage" among all existing CBDC projects.[31]

China commenced CBDC research in 2014,[32] and has actively piloted CBDC since 2020 for several rounds in an increasingly number of cities across the country. China has ramped up its rollout of CBDC to, inter alia, strengthen domestic regulation and stimulate consumption to support economic growth.[33] In October 2020, the PBOC proposed a central banking law amendment to prohibit RMB-pegged digital tokens and legalize China's CBDC.[34] In July 2021, a white paper on China's

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[27] For the analysis of CBDCs and their impact on the future of international financial system, see, e.g., Heng Wang & Simin Gao, *The Future of the International Financial System: The Emerging CBDC Network and Its Impact on Regulation*, 1–25 (2021).

[28] Raphael Auer, et al., *Rise of the Central Bank Digital Currencies: Drivers, Approaches and Technologies*, BIS WORKING PAPERS NO 880, 9 (2020). ("During the Covid-19 pandemic, social distancing measures, public concerns that cash may transmit the Covid-19 virus and new government-to-person payment schemes have further sped up the shift toward digital payments …").

[29] *Id*. at 9 ("In China, pilot testing for the new CBDC is coinciding with a phasing out of pandemic-related mobility restrictions.").

[30] For the analysis of China's CBDC, see, e.g., Wei Shen & Liyang Hou, *China's Central Bank Digital Currency and Its Impacts on Monetary Policy and Payment Competition: Game Changer or Regulatory Toolkit?*, 41 COMPUTER LAW & SECURITY REVIEW 1, 1–12 (2021);Heng Wang, *China Meets Digital Currency: E-CNY and Its Implications for Businesses*(2021), *available at* https://lawgazette.com.sg/feature/china-meets-digital-currency-e-cny-and-its-implications-for-businesses/;Heng Wang, *China's Approach to Central Bank Digital Currency and Its Sustainability*, 1–30 (2022).

[31] Auer, et al., BIS WORKING PAPERS NO 880, 22 (2020).

[32] Reuters Staff. 2019.

[33] Tom Wilson & Marc Jones, *China Proposes Global Rules for Central Bank Digital Currencies* (2021), *available at* https://www.reuters.com/article/us-cenbanks-digital-china-rules-idUSKBN2BH1TA.

[34] PEOPLE'S BANK OF CHINA, Peoples Bank of China, *Notice by the People's Bank of China of Request for Public Comments on the Law of the PRC on the People's Bank of China (Amendment Draft for Consultation)* (2020), *available at* http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4115077/index.html.

CBDC was issued.[35] From China's perspective, China's CBDC may help to promote the internationalization of the renminbi and "reduce dependence on the dollar-dominated payment system."[36] China appears to promote international rules for CBDCs, which involve many regulatory issues including the interoperability between CBDCs, and possibly synchronised information and fund flows.[37]

Diem and China's CBDC would profoundly affect monetary and payment systems, and broadly, the world economy. New technology brings regulatory disruption. These new digital currencies, both private and public ones, have the advantages such as convenience and efficiency as a means of payment, and expanded access to financial services.[38] Meanwhile, they impose new challenges to regulation ranging from privacy to operational resilience (e.g., cyber security).[39] To illustrate, stablecoins are "not governed by any specific regulations" at the international level.[40] Therefore, both national regulators and international bodies like the Financial Stability Board (FSB) have considered the issues related to Diem.[41] Stablecoins (like Diem) and CBDC "raise both innovative legal issues as well as the types of legal issues normally associated with payment systems (including risk of loss, counterfeiting, privacy, money laundering, and consumer protection), although in novel contexts."[42]

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[35] Working Group on E-CNY Research and Development of the People's Bank of China, *Progress of Research & Development of E-CNY in China*, 1−15 (2021).

[36] Tom Wilson & Marc Jones, *China Proposes Global Rules for Central Bank Digital Currencies* (2021), available at https://www.reuters.com/article/us-cenbanks-digital-china-rules-idUSKBN2BH1TA.

[37] Wilson & Jones. 2021. ("Interoperability should be enabled between CBDC systems of different jurisdictions and exchange … Information flow and fund flows should be synchronized so as to facilitate regulators to monitor the transactions for compliance").

[38] Biswajit Banerjee, *Digital Currencies and Cross-Border Policy Cooperation and Coordination*, 2 G20 DIGEST 23, 28 (2020).

[39] G7 Working Group on Stablecoins, *Investigating the Impact of Global Stablecoins*, ii, 6 (2019).

[40] FINMA, Supplement to the Guidelines for Enquiries Regarding the Regulatory Framework for Initial Coin Offerings (ICOs). 2019.

[41] See, e.g., FINMA, *Libra Association: FINMA Licensing Process Initiated* (2020), *available at* https://finma.ch/en/news/2020/04/20200416-mm-libra/;Financial Stability Board, 1-69. 2020.

[42] Schwarcz, *supra* note 10 (arguing that digital currencies have the potential to improve efficiency and speed to facilitate payments and transactions).

The impact of these new digital currencies on monetary and regulatory systems requires a deeper investigation to understand their fast-changing dynamics. This Article explores the following questions: what pathways are chosen by new digital currencies issuers (i.e., Diem and China's CBDC) to expand their influence and increase adoptions? How would Diem and China's CBDC likely affect the rules of the game in financial sector? These questions help to explore the future of financial regulation from the digital currency perspective. Bitcoin will be referred to in the analysis to understand the broader context of international financial system in terms of digital currencies.

The rest of the Article is organised as follows. Section II critically reviews Diem and CBDC, and contrasts them from various perspectives so as to examine the similarities and differences between these two forms. A comparison between Diem and China's CBDC offers insights into the various regulatory challenges that each involves. Such comparison helps to understand the different pathways in international financial system and their implications for governments, businesses and other stakeholders. Both operate in the regulatory space, not only interacting with existing regulation, but also calling for regulatory changes. Section III thus explores the impact of Diem and China's CBDC on international financial system, particularly the challenges to financial regulation, which is considered less effective in managing the risks of digital currencies. Section IV explores the regulatory outlook for new digital currencies (particularly Diem and China's CBDC) and reflects on paths forward for digital currencies. Section V concludes with an outlook for the future of digital currencies.

II. Diem v. China's CBDC: Comparing Different Natures

Albeit in their rudimentary stages, Diem and China's CBDC are game changers for financial regulation for at least three reasons. First, Diem and China's CBDC are likely to be widely used if everything goes smoothly, thus reducing the use of paper currency. Second, they generate new and huge volumes of data and likely involve digital identity. This brings new and complex legal issues ranging from technology to privacy. They affect wide-ranging stakeholders including businesses and the public. Finally, both challenge the dominant role of the U.S. dollar. All these aspects will profoundly affect the traditional practice of central banks in issuing currency and disrupt the current financial system. They also challenge existing financial regulation and traditional fiscal and monetary policy. The pathways of Diem and China's CBDC are explored in this part.

A. Diem

Libra consists of a scalable blockchain as the "technological backbone of the payment system", Libra Coins "backed by the Libra Reserve of assets made up of cash or cash equivalents and very short-term government securities," and governance by the Libra Association and its subsidiary Libra Networks, whose task is to "develop[] and operat[e] the payment system."[43] Generally speaking, Libra would be not only payment networks,[44] but also a "supranational digital currency."[45] It would facilitate cross-border transactions.[46] It seems that Diem could be redeemed through Designated Dealers who are to be "well-capitalized financial institutions that will have the right to purchase Diem coins," with its underlying assets being "held in Reserve, which will be held by geographically distributed network of well-capitalized banks."[47] Diem is likely to be widely used, such as being used by retailers to accept and make payments.[48] Diem has several distinct features.

First, although its performance remains to be seen, Diem is the first-of-its-kind global stablecoin that endeavours to reduce the volatility of pricing as faced by many cryptocurrencies (like Bitcoin).

Diem falls into the category of a stablecoin that is a kind of private money.[49] Like many stablecoins (except Tether, whose contract seems to be equity that resembles money market funds), Diem's contract is regarded as debt.[50] Originally, Libra Coins were proposed to be supported by a corresponding basket or reserve of assets (Libra Reserve), composed of cash or cash equivalents (e.g., bank deposits) and short-term government securities.[51] Diem design has changed from

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[43] Libra, 5 (2020). (discussing the system of Libra blockchains and currencies).
[44] *Id.* at 5 (discussing Libra as a payment system and network).
[45] Emir Hrnjic, *As China's Digital Currency Moves Ahead, Can Facebook's Libra Match Up?*, ThinkChina (2020), *available at* https://www.thinkchina.sg/chinas-digital-currency-moves-ahead-can-facebooks-libra-match.
[46] *Id*. (discussing how Libra could be used as a "settlement coin in cross-border transactions").
[47] Gorton & Zhang, 15 (2021), Libra, 13, 16, 17 (2020). (arguing that systemic risks of stablecoins must be addressed).
[48] Eyers. 2021. ("[Libra] could then be made available to retailers via "merchant acquirers", while other members of the Diem Association . . . could make Diem available over the next few years.").
[49] Catalini & Massari. 2021.
[50] Gorton & Zhang, 12 (2021).
[51] Libra, (2020).

being pegged to a basket of currencies to being linked and backed only to the U.S. dollar (Diem USD).[52] This design attempts to minimize volatility, cultivate trust, and allow Diem to edge closer to money, beyond the mere provision of payment services.

Although Diem's link to the U.S. dollar reduces the severe volatility concern, it does not mean Diem is always "stable". Diem's stability depends on the management of operation risks, systematic risks (particularly too big and connected to fail), and financial risks. In reality, Libra is not truly stable from the perspective of the Libra holders, since the value of the linked currency rises and falls in line with the changes in international market depending on the supply-demand equilibrium.[53] Moreover, Libra could still lend itself to speculation because the voting power is afforded based on the investment level (i.e., the investment in Libra), not participation.[54] In other words, voting power is not based on an equal number of votes for every participant. Instead, voting power is determined by reference to the stake that a member has secured by investing in Libra. Shares of future profits are "proportionate to a member's stake in the system" and future profits are calculated by reference to the interest generated from the investment in the Libra reserve; since profits are connected to interest on the association's reserve funds, "those managing it may well become riskier and more speculative over time".[55] Speculation over Libra could have particularly harmful ramifications in developing or politically fragile countries: were it to create artificial demand, it would lead to an increase in the price of goods beyond inflation-adjusted levels.[56]

Second, Diem, which is led by Big-Tech firms, largely reflects a bottom-up approach that is in line with the logic of financial inclusion and sharing economy.[57] Libra, as with cryptocurrencies, is arguably "a

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[52] Press Release, FINMA, Diem Withdraws Licence Application in Switzerland. 2021; Browne. 2021; Eyers. 2021.

[53] Zetzsche, et al., UNIVERSITY OF NEW SOUTH WALES LAW RESEARCH SERIES UNSWLRS 19–47, 20–22 (2019).

[54] Bill Maurer & Daniel Tischer, *Facebook's Libra: It's Not the 'Crypto' That's the Issue, It's the Organisation Behind It*(2019), *available at* https://theconversation.com/facebooks-libra-its-not-the-crypto-thats-the-issue-its-the-organisation-behind-it-121223.

[55] *Id.*

[56] Continental Currency, *FX101: Currency Speculation* (2018), *available at* https://blog.continentalcurrency.ca/currency-speculation/.

[57] RYAN CLEMENTS, GOVERNMENT OF B.C., EXPERT PANEL OF BASIC INCOME, FINANCIAL INCLUSION IN BRITISH COLUMBIA: EVALUATING THE ROLE OF FINTECH 22 (Dec. 30, 2020) (arguing that although Diem has a much more

private good."[58] However, this is not absolute. Libra is a privately-issued currency governed by the rules of the Libra Association (renamed to Diem Association in December 2020)[59] and its subsidiary Libra Networks that are designed to develop and operate the payment system.[60] According to Libra, a network of custodian banks will hold the assets comprising the asset reserves.[61] These businesses seem to occupy a monopolistic power in the platform economy while other firms may not be in the same position to issue a Libra-equivalent digital currency. Therefore, one may argue that to some extent Libra also shares some features of a top-down approach based on its predominant position in the marketplace. It reflects a kind of market power by large businesses at least in the economic sense.

Third, Libra uses a blockchain as "the technological backbone of the payment system."[62] Libra's technical foundation is a centralized blockchain,[63] running from the servers of the Libra Association's members, including Facebook, Uber, and Spotify. Libra is based on blockchain technology, and the blockchain network nodes will provide the framework with network and reserve management.[64] If properly managed, this may enhance trust among some users and regulators. Blockchain has other advantages such as reducing the digital verification cost.[65] As we have seen in other contexts, the blockchain technology transforms the financial landscape and challenge traditional business models. In contrast, it seems that China's CBDC does not

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modest vision than Libra, it still provides a handful of financial inclusion benefits).

[58] Andrew B. Whitford & Derrick Anderson, *Governance Landscapes for Emerging Technologies: The Case of Cryptocurrencies*, REGULATION & GOVERNANCE 1, 3.

[59] Diem, *Economics and the Reserve*, *available at* https://www.diem.com/en-us/economics-and-the-reserve/#overview.

[60] Libra, (2020).

[61] *Id*. at. 13 ("The assets comprising the Reserve will be held by a geographically distributed network of well-capitalized custodian banks to provide both security and decentralization of the assets.").

[62] *Id*. at.

[63] Gian Volpicelli, *What is Libra? Facebook's Cryptocurrency, Explained* (2019), *available at* https://www.wired.co.uk/article/facebook-libra-cryptocurrency-explained.

[64] *Id*. at 2 ("With the Bitcoin blockchain, anyone can theoretically run a node, even if that's expensive. In contrast, Libra's nodes will be only run from the servers of the Libra Association's members …")

[65] Catalini & Massari. 2021.

heavily rely on blockchain technology,[66] although China's CBDC may take advantage of blockchain in some aspects (e.g., security).

Related to blockchain, Diem is not fully decentralized and is therefore a permissioned–not permissionless–system.[67] A permissioned blockchain means that "only authorized validators are allowed on the network,"[68] which contrasts with Bitcoin's distinctive feature of "full decentralization."[69] As a decentralised payment system, Bitcoin is "not managed by a centralized authority such as a government agency or a financial institution."[70] The original design of Libra was "only partly decentralized."[71] Accordingly, a number of leading institutions have formed a consortium, which is represented by the Libra Association.[72] Relatedly, "the revised proposal in April 2019 for Facebook's planned digital currency, Libra, to include embedded supervision highlights the need to give up on a fully decentralised design to have a chance of winning regulatory approval."[73] In Libra White Paper v 1.0 published in June 2019, an important goal of the Libra Association is to "move

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[66] Alun John, *Explainer: How Does China's Digital Yuan Work?* (2020), *available at* https://www.reuters.com/article/us-china-currency-digital-explainer-idUSKBN27411T.

[67] Volpicelli, *supra* note 63 ("The white paper says that, over the next five years, Libra will shift from the current proposed model—also called a "permissioned" blockchain—to a totally decentralized—or "permissionless" blockchain.)

[68] Panos Mourdoukoutas, *Libra Is A 'Better Paypal,' Not A Liberating Currency Like Bitcoin, ETH, XRP, And LTC*(2019), *available at* https://www.forbes.com/sites/panosmourdoukoutas/2019/10/10/libra-is-a-better-paypal-not-a-liberating-currency-like-bitcoin-eth-xrp-and-ltc/?sh=50e12f722c96.

[69] 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 1, 18 (2020). ("bitcoin remains largely unique in respect of full decentralization …").

[70] PRASAD, 5. 2021.

[71] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 25 (2020).

[72] Zetzsche, et al., UNIVERSITY OF NEW SOUTH WALES LAW RESEARCH SERIES UNSWLRS 19–47, 6 (2019).("The consortium is represented through Libra Association …").

[73] Karen Yeung, *What Is China's Sovereign Digital Currency?* (2020), *available at* https://www.scmp.com/economy/china-economy/article/3083952/what-chinas-cryptocurrency-sovereign-digital-currency-and-why.

toward increasing decentralization."[74] However, this statement seems to be absent in the Libra White Paper v 2.0.[75] The feature of full decentralization may not fit well in the existing financial regulatory framework, possibly limiting the enforcement powers of financial regulators in financial markets though it may deepen financial inclusion and sharing economy.

Last but not least, Diem's design is not yet completely fixed and is substantially affected by the feedback of different actors, particularly regulators. Libra White Paper v 2.0 has highlighted several major changes (e.g., "[e]nhancing the safety of the Libra payment system with a robust compliance framework", and "forgoing the future transition to a permissionless system while maintaining its key economic properties") to "address regulatory concerns."[76] Various concerns (e.g., money laundering and the insufficient protection of users' privacy[77]), regulatory scrutiny, and departure from the project by the Libra Association's most prominent members such as Visa, Mastercard, and PayPal, caused Facebook and its partners to revamp Libra's design. After its announcement in June 2019, the plan for Libra has gone from creating a new global financial system where Facebook may essentially play the role of a central bank and a virtual Wall Street, to a narrower focus on creating a more traditional payment network in which coins will be tied to local currency, akin to the digital dollars in a PayPal account.[78] Another significant change that the Diem Association plans to make is to abandon the open architecture of Bitcoin, which features a so-called permissionless quality that allows anyone to build on its

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[74] Darren Parkin, *Facebook's Libra White Paper in Full* (2019), *available at* https://www.yahoo.com/entertainment/facebook-libra-white-paper-full-123041173.html.

[75] LIBRA, *supra* note 12 (supporting statement that decentralization only appears once in the paper and doesn't appear to be an important goal based on the text).

[76] Libra, 1 (2020).

[77] Browne. 2021."… [C]entral bankers and politicians [were] worried it could undermine sovereign currencies like the dollar, enable money laundering and infringe on users' privacy").

[78] Nathaniel Popper & Mike Isaac, *Facebook-Backed Libra Cryptocurrency Project Is Scaled Back* (2020), *available at* https://www.nytimes.com/2020/04/16/technology/facebook-libra-cryptocurrency.html. ("… will now focus on creating a more traditional payment network in which coins will be tied to digital currency").

platform.[79] It appears that Diem would be a closed system on which only partners with the approval of the Association may build infrastructure (e.g., wallets).[80] Diem has been "reshaped to make it more appealing to" US regulators,[81] and Facebook's original plan has even been observed to be "replaced by a proposal to help governments implement central bank digital currencies."[82]

B. China's CBDC

Foremost, China's CBDC is a digital legal tender besides its role as a payment instrument. According to Changchun Mu, the Director of PBOC Digital Currency Institute, CBDC is a payment instrument.[83] Moreover, China's CBDC contrasts with private digital currency that is not a legal tender.[84] CBDC is public money that "includes central banks-issued cash and digital claims against central banks."[85] China's CBDC is legal tender for all public and private transactions, centrally issued by the PBOC, fixed in nominal terms and backed 1:1 by fiat reserves (M0 supply), with some level of anonymity[86] and encryption features. China's CBDC is to be a digital form of China's sovereign currency, giving it the same legal status as physical renminbi, the Chinese yuan,

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[79] *Id.* ("… association is also abandoning plans for Libra to take the distinctive open architecture of bitcoin")

[80] *Id.* ("Libra will now be a closed system … which only partners with the approval of the association can build infrastructure, such as wallets").

[81] Eyers, *supra* note 17.

[82] Siddharth Venkataramakrishnan, *Top Officials Join Battle over Safety of Stablecoins* (July 26, 2021), https://www.ft.com/content/1dbe9285-91c3-4c39-958e-203912f5794f.

[83] Xiangyu Duan, *Observe How the Central Digital Currency Affects You and Me* (June 08, 2020), http://blockchain.people.com.cn/n1/2020/0608/c417685-31739212.html [https://perma.cc/HGA7-M93Y] ("A controllable anonymous payment tool with value characteristics and legal compensation").

[84] *See* Catalini & Massari, *supra* note 7 ("Modern money is a combination of public and private money. Public money includes central banks-issued cash and digital claims against central banks. Private money includes deposit claims against commercial banks.").

[85] *Id.*

[86] BANK FOR INT'L SETTLEMENTS, Zhengwei Lu, *The Launch of Digital Currency is of Benefit to the Innovation of Monetary Policy*, CHINA SECURITIES JOURNAL (2020). ("A key feature of cash is that no centralised [sic] records of holdings or transactions exist. Some have arguedthat the main benefit a CBDC could bring would be some level of anonymity for electronic payments").

which is the only fiat currency issued by China's central bank.[87] China's proposed central banking law amendment provides that renminbi would be in paper and digital forms.[88] China's CBDC would complement M0 money (note, coins in circulation, and central bank depository accounts) supply,[89] and rely on the creditability of the central bank.[90]

CBDC is designed to work like digital cash. China's CBDC will be "a cash-like liability" of the PBOC "available to the general public – and to foreign visitors of China."[91] The central bank would issue its CBDC for circulation among economic actors.[92] As the financial institutions that are involved in the CBDC distribution shall maintain a 100% reserve ratio,[93] CBDC would not have any derivative deposit or money multipliers. Currently, China's CBDC does not have interest

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[87] Zoey Zhang, *China's Digital Yuan: Development Status and Possible Impact for Businesses* (2020), *available at* https://www.china-briefing.com/news/chinas-digital-yuan-status-roll-out-impact-businesses/. ("The draft law proposed that legitimate currency can be digital currency, giving digital yuan, the same legal status as physical yuan, and any institution or individual must not produce or sell digital tokens to prevent risks associated with virtual currencies ").

[88] PEOPLE'S BANK OF CHINA, *supra* note 34, at 5 ("The renminbi includes physical form and digital form.").

[89] Auer, et al., BIS WORKING PAPERS NO 880, 22 (2020). ("If there is a decision to go beyond the current pilot stage, the DC/EP will become a complement to M0, which includes banknotes and coins, as well as central bank depository accounts. It is not intended to fully replace physical cash.").

[90] In a fiat money system, base money includes bank reserve requirements and money in circulation. Bitcoin however decouples credit and money. *See* Ping Xie, Chuanwei Zou & Haier Liu, Internet Finance in China: Introduction and Practical Approaches 95 (Routledge 2016).

[91] Auer, et al., BIS WORKING PAPERS NO 880, 6 (2020). ("DC/EP will be a cash-like liability of the PBC available to the general public—and to foreign visitors of China—through account-based interfaces.").

[92] *Id.* at 3 ("As of late 2019, central banks representing a fifth of the world's population reported that they were likely to issue CBDCs very soon (Boar, et al. (2020)). Similarly, the share of central banks (by number) that are likely to issue a retail CBDC over the medium term (in one to six years) doubled in 2019, to 20%. Meanwhile, a full 80% of surveyed central banks are engaging in research, experimentation or development of CBDCs.").

[93] Yifei Fan, *Some Thoughts on CBDC Operations in China* (2020), *available at* https://www.centralbanking.com/fintech/cbdc/7511376/some-thoughts-on-cbdc-operations-in-china. (finding that in order to qualify as legal tender, the "commercial banks would need to pay the central bank 100% reserves against the CBDC issued.").

rates.[94] The holders of China's CBDC would not receive interest from the central bank.[95]

Second, China's CBDC will be a retail one[96] with a "hybrid CBDC" structure, in which CBDC will have two tiers (layers) for issuance and redemptions: the first tier with the PBOC issuing and redeeming CBDC through commercial banks, and the second tier with institutions like commercial banks (second-tier institutions) redistributing CBDC to retail market actors.[97] The second-tier institutions include Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China and China Construction Bank, China Mobile, China Telecom, China Unicom, Ant Group, and Tencent.[98] These second-tier institutions will be responsible for compliance with Know-Your-Customer and Anti-Money Laundering (KYC/AML) laws, privacy protection, and investment in technology and equipment.[99] Commercial banks will redistribute China's CBDC.[100] China's CBDC

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[94] Binance Research (Jinze & Etienne), *First Look: China's Central Bank Digital Currency*, (2019). https://research.binance.com/en/analysis/china-cbdc [https://perma.cc/L4MK-9HRD] ("As the Chinese CBDC targets to be a substitute for China's M0 supply, CBDC-holders would not receive any interest from the central bank if it is not parked in any financial institutions. In this way, China's CBDCs would not compete with commercial bank deposits, and would not have a noticeable impact on the existing economy in this regard.").

[95] *Id.* ("… CBDC-holders would not receive any interest from the central bank if it is not parked in any financial institutions.").

[96] Herbert Poenisch, *CBDC With Chinese Characteristics* (2020), *available at* https://www.omfif.org/2020/09/cbdc-with-chinese-characteristics/. ("China has the best digital retail payment system, operated by the duopoly of Alipay and Wechatpay. China is planning a retail CBDC, one of only a few central banks to do so.").

[97] Binance Research (Jinze & Etienne), (2019). (detailing that the two-tier system of CBDC's hybrid structure will allow the PBOC to work towards replacing paper money, as the current paper system is two-tiered).

[98] Xiaochuan Zhou, *Understanding China's Central Bank Digital Currency*(2020), *available at* http://www.cf40.com/en/news_detail/11481.html. (confirming that the CBDC utilizes a two-tier operating system with each listed institution appearing in the second tier).

[99] *Id*. at. ("The second-tier institutions should shoulder the following responsibilities. First, they must have sufficient capital to cushion risks. Second, they must follow due KYC (know their customer) procedures, and on top of which bear the responsibilities of anti-money laundering and data privacy protection. Third, they need to invest in technology and equipment, and ensure the continued operation of equipment.").

[100] *Id*. at.

is a direct claim on the PBOC, but "onboarding and real-time payment services are operated by intermediaries," with the central bank "periodically receiv[ing] and stor[ing] a copy of retail holdings and transactions."[101] China's CBDC will have "two repositories" (the PBOC's issuance database and commercial banks' database, as well as the individual wallets used by private actors) and "three centers" (i.e., data centers to perform authentication, registration, and big data analysis).[102]

China's CBDC seems to promote retail use by, inter alia, supporting offline payment, enabling its digital wallets to operate without the need for commercial bank accounts, and abolishing charges on payment.[103] All of these factors go beyond the existing online payment system in China.[104] If properly managed, some of these designs may help promote financial inclusion.[105]

Moreover, China's CBDC would not only serve as a complement to cash for use in online transactions, but would also likely play a strong role in mobile payments whose existing major suppliers include Alipay and WeChat Pay.[106] Under the two-tier approach to the CBDC, the PBOC achieves its goal of replacing paper money without subverting the existing monetary issuance and circulation system.[107]

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[101] Auer, et al., BIS WORKING PAPERS NO 880, 22 (2020). (including a graph that further details the structure of the hybrid CBDC).

[102] Binance Research (Jinze & Etienne), (2019). ("Yao Qian, the former head of PBoC's Digital Currency Research Institute, described in his 2018 paper that this central bank digital currency would be built on the following 'one coin, two repositories, and three centers' [sic] approach.").

[103] Michelle Lim, *How Does China See Its CBDC and Its Use in Cross-Border Payments*? FORKAST (Mar. 26, 2021), https://forkast.news/china-cbdc-dcep-cross-border-payments/ [https://perma.cc/5HJK-USPC] (outlining that China's other key motivations for launching its CBDC project is to provide a backup or redundancy for the retail payment system, enhance the efficiency of payments systems, and improve financial inclusion).

[104] *See id*. (declaring that an offline mode also allowed people without network coverage to make payments using the retail CBDC).

[105] *See id.* (suggesting that China's retail CBDC enabled people living in remote areas to open digital wallets with just their mobile phone number, without the need for traditional bank accounts, and enjoy access to basic financial services).

[106] Auer, et al., BIS WORKING PAPERS NO 880, 22 (2020).

[107] Jinze & Etienne, *supra* note 94 ("By adopting the two-tier system on its digital currency, the People's Bank of China would achieve its goal of replacing paper money without subverting the existing monetary issuance and circulation system, which is also two-tier based.").

Third, China's CBDC is centralized and solely controlled by the central bank.[108] This contrast with Diem is advocated by Big-Tech firms.[109] China's CBDC features manageable anonymity: it "will not operate through an anonymous and untraceable peer-to-peer mechanism, like cryptocurrencies do" and "[i]ts transactions will be visible to the central bank."[110] The central bank will issue and distribute its CBDC via commercial banks and other businesses.[111] These businesses include online payment service providers such as Ant Group and Tencent.[112] China's CBDC has a loosely-coupled design, by which their transfer will not necessarily require a bank account.[113] The end goal is likely to achieve a turnover rate as high as cash.[114]

The reasons for a central bank to consider issuing CBDC may include monetary sovereignty, universal acceptance, effective transmission of monetary policy, and the use of CBDC in addressing tax evasion and capital outflow.[115] Some of these possible issues (such as tax evasion and capital outflow) have been regarded as the drawback of

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[108] *Id.* at 5 ("To ensure monetary sovereignty and effective transmission of monetary policy, the CBDC would be issued solely by the central bank, which will give the CBDC ultimately legal status as tender.").

[109] LIBRA, *supra* note 12, at 4 ("Blockchains have a number of unique properties that can potentially address some of the problems of accessibility and trustworthiness. These include distributed governance, which ensures that no single entity controls the network; open access, which allows anybody with an internet connection to participate; and security through cryptography, which protects the integrity of funds.").

[110] Li Qing, *Yuan to Go Digital*, BEIJING WEEKLY, 2019.

[111] PEOPLE'S BANK OF CHINA, Working Group on E-CNY Research and Development of the People's Bank of China, 3 (2021).

[112] Guohui Li & Meiruo Ma, *Positive Progress Has Been Made in the E-CNY Research & Development Pilot: Central Bank Held a Media Briefing on the White Paper on Progress of Research & Development of E-CNY in China*(2021), *available at* https://www.financial news.com.cn/jg/dt/202107/t20210719_223623.html.

[113] Jinze & Etienne, *supra* note 94 ("Unlike "tight coupling", the Chinese CBDC would be transferable between two parties, without the need for a bank account, unlike how traditional payments or fund transfers work in most countries.").

[114] *Id.* at 9 ("The end goal for the CBDC is to display a turnover rate as high as cash, while achieving "manageable anonymity.").

[115] *Id.* at 5, 14 ("To ensure monetary sovereignty and effective transmission of monetary policy, the CBDC would be issued solely by the central bank, which will give the CBDC ultimately legal status as tender.").

private digital currency,[116] and China is not alone in its concern over the negative impacts of privately-issued cryptocurrency. For example, the Central Bank of Norway has issued warnings about the risks associated with the private outsourcing of interbank systems, and pointed to CBDCs as a contingency option.[117] That said, China differs from many other countries in that it prohibits trading of private digital currency.[118] By prohibiting the trading of cryptocurrencies and preparing to implement a CBDC, China is effectively eliminating the possibility of paper currency obsolescence to privately-issued money and enhancing the role of the government.[119] China's CBDC strengthens the role of the government in the society, including providing "central bank tight centralized control over digital money."[120] Finally, China's CBDC is a moving target. For instance, it remains to be seen whether China's

[116] Martin Chorzempa, *China, the United States, and Central Bank Digital Currencies: How Important Is It to Be First?*, CHINA ECONOMIC JOURNAL 1, 3 (2021).

[117] *See* Jon Nicolaisen, Deputy Governor, Norges Bank, Speech at Finance Norway's payment conference (Nov. 14, 2019), https://www.bis.org/review/r191115f.pdf [https://perma.cc/2Q2N-CL5X] ("There must also be contingency arrangements in Norway that in a crisis can quickly take over tasks that are performed abroad.").

[118] Chorzempa, s*upra* note 116 at 5 ("The PBOC and other regulators quickly banned ICOs in one of the harshest regulatory approaches in the world, and soon after kicked cryptocurrency exchanges that made digital currencies accessible to the general public out of the country, making it clear that only digital currency issued or effectively regulated by the PBOC could circulate in China.").

[119] *See* Jinze & Etienne, *supra* note 94 ("By adopting the two-tier system on its digital currency, the People's Bank of China would achieve its goal of replacing paper money without subverting the existing monetary issuance and circulation system, which is also two-tier based.").

[120] Narayanan Somasundaram, *Will China's Digital Yuan Vanquish the Dollar?* (2021), *available at* https://asia.nikkei.com/Spotlight/The-Big-Story/Will-China-s-digital-yuan-vanquish-the-dollar?del_type=1&pub_date=20210811190000&seq_num=2.

CBDC is predominantly account-based,[121] token-based,[122] or both,[123] because there are different views on this issue. It seems that China's CBDC chooses both an account-based and token-based approach. China's CBDC could be tokenized in many circumstances. [124] Meanwhile, digital wallets related to China's CBDC could be used without opening or linking to a bank account in certain circumstances (e.g., foreigners visiting China for a short period of time).[125]

To sum up, Diem and China's CBDC have similarities such as their likely use in retail practice. They may face some similar challenges such as interoperability.[126] There are more differences than similarities between Diem and China's CBDC. A key difference between Diem and China's CBDC is that Diem is created by private entities.[127] By contrast, China's CBDC is "a liability of the state"[128] and is backed by the central bank. They are substantially different as they are private and public digital currency led by private actors and the central bank respectively. In terms of technology, Diem seem to rely heavily on blockchain but this does not appear to the be case for China's CBDC possibly due to

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[121] *See* Auer, et al., BIS WORKING PAPERS NO 880, 23 (China's CBDC being "[m]ostly account-based") (2020)."Regarding access, PBC has decided to use a value-based, semi-account-based and account based hybrid payment instrument.").

[122]*See* Sarah Allen, et al., *Design Choices for Central Bank Digital Currency: Policy and Technical Considerations*, GLOBAL ECONOMY & DEVELOPMENT WORKING PAPER 140, 82 ("the system should operate in two tiers with two distinct layers of functionality: interaction with commercial banks and token-based interactions") (2020).

[123] *See* Jinze & Etienne, *supra* note 94 (introducing different areas that could be considered as money to be covered within the scope of the CBDC including both central bank accounts and central bank digital tokens).

[124] *See* Poenisch. 2020. ("CBDC will be account based rather than tokenised.").

[125] Karen Yeung, *What Is China's Cryptocurrency Alternative Sovereign Digital Currency and Why Is It Not Like Bitcoin?*(2020), *available at* https://www.scmp.com/economy/china-economy/article/3083952/what-chinas-cryptocurrency-sovereign-digital-currency-and-why. ("There is also an option [for an electronic wallet] that does not require a bank account.").

[126] See, e.g., Catalini & Massari. 2021. ("Absent new technology and legal infrastructure, deposit coins may not be fully interoperable.").

See De, *supra* note 16 ("The move represents a sharp departure from Diem's origins as the Libra Association which was announced by Facebook in the summer of 2019 and formally created as a partnership with buy-in from a host of different companies in Switzerland that fall.").

[128] Hrnjic. 2020.gital, they are a liability of the bank. In contrast, China's CBDC is a liability of the state.").

concerns like scalability.[129] Given both Diem and China's CBDC are a moving target, a closer look of their approaches is needed along with their development.

C. Functional Differences Among Diem, China's CBDC, and Bitcoin

As Bitcoin is one of the most widely used cryptocurrencies, it is worth comparing its functionality to that of Diem and China's CBDC, based on currently available functional specifications, to understand what Diem and China's CBDC could do for end-users. A comparison can also assist in understanding how these two new digital currencies would work in the market and how institutions, regulations, and legal framework would need to change in response to certain functions of digital currency which go beyond the traditional functions of a currency like a store of value, medium of exchange, and unit of account.

1. Diem and Bitcoin

Both Diem and Bitcoin are cryptocurrencies that are "digital representations of tokens that reside on blockchains."[130] However, there are various differences between Diem and Bitcoin. First, a major difference between Diem and Bitcoin is the scale, particularly given the number of Facebook users.[131] Scale means that Diem would probably impose a more substantial challenge to state issuance of currency compared with Bitcoin.[132]

Second, they are different in terms of whether they are backed by fiat currency. Diem is "allegedly backed one-for-one with

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[129] *See* Li & Ma. 2021;Da Ke, *Legal Thinking of E-CNY*(2021), *available at* http://www.legalinfo.gov.cn/pub/sfbzhfx/sfbzfpffzll/202108/t20210804_433365.html. [https://perma.cc/48NX-FRMJ] ("It can be seen that the digital renminbi retains some of the contents of the blockchain architecture."); LIBRA, *supra* note 12 (explaining Libra project will be made up of three parts including "[A] secure, scalable, and reliable blockchain as the technological backbone of the payment system.").

[130] Gorton & Zhang, 2 (2021). ("Cryptocurrencies are digital representations of tokens that reside on blockchains.").

[131] Arner, CALIFORNIA WESTERN INTERNATIONAL LAW JOURNAL, 246 (2021). (the big difference here was scale).

[132] Id. at. at 2 ("The big difference here was scale … this means [Libra/Diem] could have the scale to challenge state issuance of currency in a way that, so far, Bitcoin and other crypto-currencies have not been able to do.").

government fiat currency (e.g., U.S. dollars) …", while Bitcion is "not backed by anything."[133] More broadly speaking, stablecoin issuers endeavour to "keep their prices at par" and this makes stablecoins different from Bitcoin.[134] As discussed elsewhere in this paper, stablecoins are not necessarily stable as they are also subject to the fluctuation of currency value in the market.[135]

Third, a crucial difference in governance structure is a critical distinction between Bitcoin and Diem. Bitcoin's decentralized governance structure creates equal access to its services because it does not rely on administrators who can lock any one user out of the system.[136] Besides its features like equal access to the services, this decentralized structure also means Bitcoin can be used for illicit purposes.[137]

In contrast, Diem's technical foundation is a centralized blockchain. Unlike Bitcoin's decentralized blockchain technology where anyone can join the group of computers—aka nodes, a centralized blockchain that verifiifies transactions, Diem would operate from the servers of the Diem Association's members.[138] Differing from Bitcoin's public ledger system, "Diem's technology will be open to only a few participants, such as Facebook and other members of the Diem Association."[139] Libra is "an evolution of the ideas underlying Bitcoin" and may help to provide solutions to various issues (e.g., transaction

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[133] Gorton & Zhang, 2 (2021).(noting that Diem is backed one-for-one with government fiat currency and bitcoin is not backed with anything).

[134] Id. at, 6. ("Stablecoins are distinct from fiat cryptocurrencies like Bitcoin because stablecoin issuers attempt to keep their prices at par.").

[135] *Id.* at 6–7 (Discussing how stablecoin issuers attempt to convince their coin holders that their currency is reliable).

[136] *See generally* Jean-Philippe Vergne, *Decentralized vs. Distributed Organization: Blockchain, Machine Learning and the Future of the Digital Platform,* 1 ORG. THEORY (2020) (Discussing the features of decentralized systems).

[137] See, e.g., Sean Foley, et al., *Sex, Drugs, and Bitcoin: How Much Illegal Activity Is Financed through Cryptocurrencies?*, 32 THE REVIEW OF FINANCIAL STUDIES 1798, 1804 (2019).(We find that illegal activity accounts for a sizeable proportion of their users and trading activity in bitcoin . . . .").

[138] Josh Constine, *Facebook Announces Libra Cryptocurrency: All You Need to Know*, TECHCRUNCH (June 18, 2019), https://techcrunch.com/2019/06/18/facebook-libra/ [https://perma.cc/CY6F-QAF5] (Discusses how nodes work and explains the structure of Facebooks "blockchain").

[139] Browne. 2021. ("Diem's technology will be open to only a few participants, such as Facebook and other members of the Diem Association.").

throughput, energy efficiency and latency) as one of the most advanced technologies in this field, including the model of "LibraBFT", an adjusted blockchain structure, and a novel custom programming language.[140]

Meanwhile, there are also concerns regarding the structure of Libra. As one critic puts it, Libra will "spawn an entire ecosystem of financial services and service providers—authorized Libra dealers, brokers, asset managers, custodians, exchanges, digital identity providers, verifiers and so on—whose identities and qualifications we cannot yet anticipate", and they "may be controlled by Facebook or by other corporate members of Libra Association" and "not subject to appropriate supervision."[141] This means that the regulatory vacuum is not a satisfactory scenario as the lack of regulatory backup damages financial customers' interests. The absence of a proper regulatory structure may be the foundational weakness for Libra's end-users. Libra makes financial regulation and conventional regulatory tools less effective as the existing financial regulation is a centralized structure targeting banks and the like.[142]

2. China's CBDC and Bitcoin

The centralization, the linking of currency to usership (reducing the aspect of anonymity which made Bitcoin popular), and the reduced chances of speculating on the value of private digital currency are among the primary differences in the functionality between China's CBDC and Bitcoin. One primary difference between China's CBDC and Bitcoin is that the former would be "a digital form of the yuan",[143]

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[140] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 24 (2020) ("Libra's design represents an evolution of the ideas underlying Bitcoin and can be used by governments as a litmus test of new technologies.").

[141] Saule Omarova & Graham Steele, *There's a Lot We Still Don't Know About Libra*(2019), *available at* https://www.nytimes.com/2019/11/04/opinion/facebook-libra-cryptocurrency.html.

[142] *See id.* ("This wouldn't merely inject more complexity, opacity and instability into the financial system—it would also create new opportunities for fraud and market manipulation on a scale likely to make the LIBOR scandal seem quaint.").

[143] Cissy Zhou, *China's New Digital Currency 'Isn't Bitcoin and Is Not for Speculation'* (2019), *available at* https://www.scmp.com/economy/china-economy/article/3043134/chinas-new-digital-currency-isnt-bitcoin-and-not-

meaning it would not need the backing of a basket of currencies. Its status as a digital form of fiat currency differentiates it from Bitcoin, the price of which is driven when demand increases at a faster rate than supply increases.[144] One may argue that China's CBDC may not have the same fluctuation in its value as that of Bitcoin.[145] Relatedly, it is claimed that price stability can be assured by the issuance of CBDC, in conjunction with an appropriate monetary framework.[146]

The partial appeal of Bitcoin is its potential for anonymous usage, and the claim that it is not backed or controlled by any government (i.e., it is fully decentralized). China's CBDC will be centralized, allowing the PBOC's authority to monitor and regulate transactions within that two-tiered network,[147] thereby making it unlike Bitcoin in these regards.

To some extent, the PBOC appears to be seeking to provide CBDC as an alternative to Bitcoin, which China has banned. [148] The PBOC's plan for a digital currency may be pre-empting a digital economy where cash has effectively disappeared and where payments center around social platforms rather than banks' credit supply. Offering a CBDC in such an environment would equip the central bank with the ability to retain monetary independence and authority. [149] That said, the

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speculation.("The currency is not for speculation. It is different to bitcoin or stable tokens, which can be used for speculationor require the support of a basket of currencies.").

[144] *See id.* (explaining that CBDC is different from bitcoin because CBDC's which is used for speculation and requires the support of a basket of currencies).

[145] *See id.* (explaining that CBDC currency is not for speculation and thus, it does not have the same fluctuation as Bitcoin).

[146] Michael D. Bordo & Andrew T. Levin, *Central Bank Digital Currency and the Future of Monetary Policy*, (Hoover Inst. Economics Working Paper, Paper No. 17104, 2017), https://www.hoover.org/sites/default/files/research/docs/17104-bordo-levin_updated.pdf [https://perma.cc/294E-TGHF] ("The monetary policy framework could foster true price stability, that is, the real value of CBDC would remain stable over time in terms of a broad consumer price index.").

[147] *See* Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 38 (2020).

[148] *See id.* at 44 (describing how sovereign digital coins differ from Bitcoin).

[149] *See id.* at 38 ("And it provides both a means of controlling currency inflows and outflows into the RMB area, initially Mainland China but with the possibility of eventual expansion beyond its borders, in the form of a potential dollar alternative, Digital Yuan area, outside of the reach of the US but fully under the oversight of China.").

CBDC also faces various challenges including issues like privacy and data protection.

III. The Impact of Diem and China's CBDC on Financial Regulation

Digital currencies challenge the status quo of both central and commercial banking. Diem and China's CBDC will profoundly affect the traditional practice of central banks in issuing currency and will disrupt the current financial system.

A. Macroeconomic (In)Stability

The interplay between digital currencies and the banking sector has an impact on monetary policy, cash flows, financial stability, and financial consumer protection. These are crucial issues. For instance, risks concerning monetary policy operations receive particular scrutiny by central banks.[150] The impact of digital currencies on banks (e.g., banking disintermediation and defunding) and monetary control are among the most important issues of macroeconomic (in)stability. Broadly speaking, digital currencies would concern Financial Market Infrastructures (FMIs) that promote clearing, settlement and recording of financial transactions.[151] CBDC, for instance, is "a central bank operated FMI".[152]

On the one hand, CBDC, if properly managed, may help to increase macroeconomic stability. CBDC works to integrate digital currencies within the monetary system,[153] and could promote financial inclusion if properly managed. China's CBDC is similar to other CBDCs that could create "new monetary policy levers" and "currency with time limits or other spending conditions (e.g., required spending on durable goods) in order to create highly targeted monetary interventions

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[150] John Kiff, et al., *A Survey of Research on Retail Central Bank Digital Currency*, IMF WORKING PAPER NO. 20/104, 40 (2020).

[151] Bank for International Settlements and International Organization of Securities Commissions, *Principles for Financial Market Infrastructures*, 1, 5 (2012).

[152] Kiff, et al., IMF WORKING PAPER NO. 20/104, 41 (2020).

[153] Margaret E. Tahyar, et al., *Digital Currencies*, *in* FINTECH LAW: THE CASE STUDIES 214, (Howell E. Jackson & Margaret E. Tahyar eds., 2020).

in a national economy."[154] Depending on its design, a CBDC may ease certain constraints on traditional monetary policy and offer "an official electronic payment system" that all the actors in the economy can access.[155] The PBOC seemingly strives to improve its monetary policy effectiveness through CBDC, while "mapping out a more comprehensive picture of all individuals and businesses across China."[156] CBDC could improve monetary policy effectiveness, including the design of its issuance (incorporating four contingencies of time, sector, loan rate, and return, which to be set by its issuing institution); activation of CBDC; return of CBDC; and forward determination of CBDC issuance volume.[157] As mentioned above, it is claimed that price stability can be assured by the issuance of CBDC, in conjunction with an appropriate monetary framework.[158] China's CBDC might help the PBOC in formulating, executing or even optimizing monetary policy, through more accurate calculation of certain metrics (e.g., inflation rate and other macroeconomic figures) and real-time monetary flow data collection as the reference for policymaking.[159]

CBDC also has the potential to contribute to optimizing the payment functions of fiat money, and has potential benefits in enhancing the utility and efficacy of payments through providing payment instruments and reducing fraud or tax-evasion.[160] Moreover, CBDC could be "a vehicle for critical national expenditure (public procurement, government subsidies) to bypass commercial banks completely," which would "reduce systemic risks associated with commercial banks, lower the

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[154] Sarah Allen, et al., *Design Choices for Central Bank Digital Currency*(2020), *available at* https://www.brookings.edu/blog/up-front/2020/07/23/design-choices-for-central-bank-digital-currency/.

[155] PRASAD, 13. 2021.

[156] Binance Research (Jinze & Etienne), (2019).

[157] *See generally* Yao Qian, *Central bank Digital Currency: Optimization of the Currency System and Its Issuance Design*, 12 China Econ. J. 1 (2019).

[158] Bordo & Levin, *supra* note 146, at 1, 11 ("By contrast, the rationale for indexing CBDC might be much less clear, as long as the monetary policy framework ensures that the price level remains reasonably stable (as discussed below).").

[159] Binance Research (Jinze & Etienne), (2019) (discussing the issuance plans for PBoC's CBDC and how the currency will ensure "monetary sovereignty and effective transmission of monetary policy).

[160] *See id.* (finding that CBDC is backed by fiat reserves and will lead to the "digitization of cash" and will prevent money laundering and tax evasion).

impact of collapse of any given financial institution and, consequently, diminish incentives to bail out failed banks."[161]

On the other hand, CBDC could pose challenges concerning macroeconomic stability. Many questions remain open regarding how new technologies may impact the structure of financial markets and institutions.[162] CBDC may bring challenges and risks to financial soundness while promoting vibrant and rapid economic growth.[163] There are concerns that CBDC may affect commercial banks as CBDC could become a substitute for retail banking deposits, restricting commercial banks' ability to make loans and bring broader macroeconomic consequences.[164] In times of a crisis, the coexistence of CBDC with retail banking deposits may increase the risk of runs on the banking sector and negatively affect financial stability.[165] It is predicted that "[i]n times of crisis, the qualities of a CBDC having the 'safety of physical cash but convenience of bank deposit accounts' could induce depositors to flee from depository institutions towards the central bank, thereby weakening financial stability."[166] The public may prefer the CBDC if the interest rates of commercial bank deposits are not high since the CBDC is to be issued by the central bank.[167]

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[161] *See* Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 35 (2020). ("SDC's could be used as a vehicle for critical national expenditure (public procurement, government subsidies) to bypass commercial banks …").

[162] PRASAD, 14. 2021.("[T]here are many unanswered questions about how the new technologies could affect the structure of financial institutions and markets …").

[163] *See generally* Ulrich Bindseil, *Tiered CBDC and the Financial System* (Eur. Cent. Bank, Working Paper Series No. 2351, 2020, https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2351~c8c18bbd60.en.pdf [https://perma.cc/4XC5-74V3] (discussing the "advantages and risks" of CBDC).

[164] Lael Brainard, *Cryptocurrencies, Digital Currencies, and Distributed Ledger Technologies: What Are We Learning?* (2018), *available at* https://www.federalreserve.gov/newsevents/speech/files/brainard20180515a.pdf.("If a successful central bank digital currency were to become widely used, it could become a substitute for retail banking deposits.").

[165] Id. at, 5–6. ("[T]he parallel coexistence of central bank digital currency with retail banking deposits could raise the risk of runs on the banking system in times of stress and so have adverse
implications for financial stability …").

[166] Tahyar, et al., 221. 2020.

[167] *See* COMMITTEE ON PAYMENTS AND MARKET INFRASTRUCTURES & THE MARKETS COMMITTEE, BANK FOR INT'L SETTLEMENTS, CENTRAL BANK

If CBDC replaces not only banknotes but also bank deposits, this would reduce the volume of banks' credit intermediation and fundamentally affect the role of banks as creditors.[168] For instance, zero interest rate on CBDC may push bank deposits to low interest rates, since the interest rates margin between CBDCs and bank deposits would not be large.[169] An example of how the fundamental role of banks would be affected by the replacing of banknotes or bank deposits by CBDC is the possible distortion of efficient resource allocation in the economy.[170] For the central bank, if CBDCs replace banknotes and/or deposits, the central bank's balance sheet would expand,[171] likely causing a re-examination of the types of assets the central bank should hold. Banking disintermediation possibly arising from CBDC could be a risk undermining regulatory effectiveness.[172] In other words, it is to be seen whether a CBDC would "decimate traditional commercial banks by drawing deposits away from them."[173] CBDC is likely to "accelerate the unbundling of credit and payment services."[174] For China's CBDC, it seems that the PBOC wants to avoid disintermediation, and "banks will be CBDC agents, CBDC will be used to top up accounts at banks, make

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DIGITAL CURRENCIES 6 (March, 2018) ("The payment of (positive) interest would likely enhance the attractiveness of an instrument that also serves as a store of value.").

[168] *Id.* at 2 ("A general purpose variant [of CNDC] could compete with guaranteed bank deposits, with implications for the pricing and composition of banks' funding.

[169] *See generally id.* (discussing the relationship between CBDC and banks via interest rates.

[170] *Id.* at 14 ("A greater role for central banks in credit allocation entails overall economic losses if central banks are less efficient than the private sector at resource allocation.").

[171] Nikhil Raghuveera & David Bray, *Design Choices of Central Bank Digital Currencies Will Transform Digital Payments and Geopolitics*, Atlantic Council(2020), *available at* https://www.atlanticcouncil.org/blogs/geotech-cues/design-choices-of-central-bank-digital-currencies-will-transform-digital-payments-and-geopolitics/. ("[T]he central bank may need to intervene on behalf of the banking sector if CBDCs replace the use of retail bank accounts …").

[172] Hossein Nabilou & André Prüm, *Central Banks and Regulation of Cryptocurrencies*, UNIVERSITY OF LUXEMBOURG LAW WORKING PAPER NO. 2019-014 1, 41, 42 (2019) ("[D]isintermediated access might cause CoBM (bank deposits) to shrink, banks' ability to make loans—at least under the fractional reserve theory of banking—would be substantially restricted.").

[173] PRASAD, 21. 2021.

[174] Catalini & Massari. 2021.

bank transfers as well as payments, bringing business to banks."[175] It is predicted that the CBDC may affect the money creation by commercial banks.[176] The effect of CBDC in this regard deserves attention.

Other challenges may exist regarding CBDC in terms of operational risks (e.g., cyber security) and the role of the central bank. These challenges are related to new activities and new institutions (such as BigTech firms) involved in CBDC.[177] To illustrate, the potential operational risks such as electronic counterfeiting and cyber risks need to be properly and effectively addressed.[178] While e-CNY will enjoy the same legal status as the renminbi, its status as a digital currency will differentiate it both functionally and technically from the physical renminbi.[179] This poses unique risks toward which monetary policy and regulation should respond. For instance, the possibility of cyber-attacks is one of the risks faced by CBDC.[180] It is observed that "[e]ven with conservative design, CBDCs will represent a technical experiment with significant risk of information-security failures" and may bring design mistakes that are "especially difficult to fix."[181] Central banks seem to be both players (as CBDC appears to develop into a payment system) and "regulators and overseers of payment systems."[182] With the introduction of CBDC, the central bank is likely to play an even greater role than before. The questions of how to exercise the increased power

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[175] Poenisch. 2020.

[176] Id. at. (explaining that CBDC will replace all forms of money, specifically eliminating money from commercial banks).

[177] Kiff, et al., IMF WORKING PAPER NO. 20/104, 44 (2020).

[178] *See* BANK OF CANADA ET AL., *Central Bank Digital Currencies: Foundational Principles and Core Features* 5, 11 (2020) ("Counterfeiting and cybersecurity present a challenge … Both the infrastructure and participants of a CBDC system should be extremely resistant to cyber attacks and other threats. This should also include ensuring effective protection from counterfeiting.").

[179] Working Group on E-CNY Research and Development of the People's Bank of China, *supra* note 34, at 3–4 (July 2021) (acknowledging that both digital and physical forms of the currency are the People's Republic's liabilities to the public but, due to China's vastness and diversity, the country will continue to supply physical RMB where "people's habits, age, and security needs vary").

[180] *See* BANK OF CANADA ET AL., *supra* note 178, at 5 (highlighting that "cyber risk[s] present a challenge" because "a successful cyber attack on a digital CBDC system could [] threaten a [] number of users.").

[181] Allen, et al. 2020.

[182] PHOEBUS L. ATHANASSIOU, DIGITAL INNOVATION IN FINANCIAL SERVICES: LEGAL CHALLENGES AND REGULATORY POLICY ISSUES 181 (Kluwer Law International. 2018).

and address potential tensions in the multiple (sometimes conflicting) roles require sensible regulatory responses. In a shift to a CBDC, stable macroeconomic and structural policies (e.g., fragile regulatory frameworks to recognize and address financial risks arising from new categories of financial intermediaries) are needed to reduce the transitional risks.[183] Overall, as the first foundational principle suggested by the Bank for International Settlements and a number of central banks states, CBDC should not "compromise monetary or financial stability."[184] How about Diem's impact on macroeconomic (in)stability? On the one hand, Diem may promote financial inclusion and facilitate international payments.[185] Notably, it could enhance access to payment services and, to some extent, alleviate the problems of financial market infrastructures in some jurisdictions.[186] Broadly speaking, private sector-led innovations may bring substantial benefits for the public and businesses due to the huge demand for "more efficient payment services at the retail, wholesale, and cross-border levels."[187] The availability of a widely accepted international instrument of payment might reduce the mistrust associated with the use of unfamiliar foreign currencies, and reduce the costs in remittance through new technology.[188] In this sense, Libra is likely to serve as "a major global

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[183] Allen, et al. 2020.

[184] Bank of Canada, et al., *Central Bank Digital Currencies: Foundational Principles and Core Features*, 1 (2020).

[185] Saule T. Omarova, *Millions of Low-Income People Are Locked Out of the Financial System. More Big Tech Monopoly Power Is Not the Answer.*, THE APPEAL, (May 6, 2021), https://theappeal.org/the-lab/report/financial-system-more-big-tech-monopoly-power-is-not-the-answer/ [https://perma.cc/8EFZ-X9E7] ("From the outset, Diem was promoted as a service that would benefit the billions of people locked out of the financial system. "); First Team, *What is Diem and Why You Should Use it*, FIRST DAG, (Mar. 11, 2021), https://www.firstdag.com/blog/what-is-diem/ [https://perma.cc/6HCT-5QDF] (highlighting that international transactions, using Diem dollars, will be promoted since their value is pegged to the United States dollar, thus "maintain[ing] their value, regardless of the country or currency it is being used in.").

[186] *See* LIBRA, *supra* note 12 ("[Diem's] mission is to enable a simple global payment system and financial infrastructure that empower billions of people.").

[187] PRASAD, 14. 2021.

[188] *See* Ruchir Sharma, *Why Crypto is Coming Out of the Shadows*, MORGAN STANLEY, (Feb. 9, 2021) https://www.morganstanley.com/im/en-us/financial-advisor/insights/articles/why-crypto-is-coming-out-of-the-shadows.html [https://perma.cc/A6LW-UR7W] (highlighting that digital currencies are becoming more popular because of the "growing distrust in fiat currencies,"

social good" in low-cost remittance,[189] thus helping to promote financial inclusion. Broadly speaking, the rise of new platforms is to promote competition and innovation, drive down costs, and enhance the financial system if properly managed.[190]

On the other hand, Diem, despite the advantages of stablecoins, may pose challenges to macroeconomic stability in various aspects, including the monitoring of money supply and the management of fiscal policy.[191] Diem may bring certain challenges that are similar to other stablecoins. Stablecoins could affect financial stability directly (affecting central banks' capacity to control monetary policy by "reducing the amount of money over which central banks can exercise such policy") and indirectly (e.g., possible operational disruption, and significant fluctuations in holders' wealth due to variation in the stablecoin's value). [192] Stablecoins, like Libra, challenge central banks' monopoly on money issuance. Stablecoins might run parallel with or partially replace local currency (currency substitution) and payment systems, particularly in some economies where the public has insufficient confidence in the fiat currency.[193] This could also be the

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and a practical application for digital currency is the "$470 billion market for remittances").

[189] Zetzsche, et al., UNIVERSITY OF NEW SOUTH WALES LAW RESEARCH SERIES UNSWLRS 19-47, 12 (2019).

[190] PRASAD, 9. 2021.

[191] G7 WORKING GROUP ON STABLECOINS, *supra* note 39, at ii (describing how "stablecoins that reach *global* scale could pose challenges to: monetary policy, financial stability, [t]he international monetary system, [and] fair competition") (emphasis in original).

[192] Schwarcz, DUKE LAW SCHOOL PUBLIC LAW & LEGAL THEORY SERIES NO. 2021-09, 43-44 (2021). ("If widely used, global stablecoins could threaten financial stability both directly and indirectly. Directly, they could impair central banks' ability to control monetary policy by reducing the amount of money over which central banks can exercise such policy … Indirectly, the threat to financial stability would depend on whether the global stablecoin is used for payments or as a common store of value … Holders relying on the stablecoin to make regular payments would face "significant operational disruptions," … If widely used as a common store of value, "even a moderate variation in [the global stablecoin's] value might cause significant fluctuations in holders' wealth.").

[193] Tracy Molino & Noah Walters, *Part 5—Evaluating Stablecoins*(2021), *available at* https://www.dentons.com/en/insights/articles/2021/january/8/part-5-evaluating-stablecoins. ("A liquid, stable, cryptocurrency could be so attractive to end-users in developing economies that they would trade out of their local currencies.").

case with the international use of CBDC. Moreover, stablecoins may even replace some CBDCs.[194] Many of these challenges would affect central banks' capacity in terms of monetary policy (such as the adjustment of interest rates) and capital control. Stablecoins also face risks as they may "collapse like an unsound currency board, 'break the buck' like money market funds in 2008, or spiral into worthlessness", or "replicate the turmoil of the 'wildcat' banks of the 19th century."[195] Payment infrastructure related to private cryptocurrencies could "freeze up under financial stress if the lack of government backing were to precipitate a loss in confidence." [196] Risks may also arise when stablecoins "move beyond cryptocurrency trading and decentralized finance (DeFi)."[197]

Stablecoins may disintermediate commercial banks' role in payments and undermine banks' capacity to provide credit to economic actors (thus consequently affecting commercial banks' sources of stable funding and transactions data) if private actors reduce their deposits at commercial banks in favor of stablecoins held in digital wallets.[198] Cryptocurrencies "threaten to shift payments, deposits, and loans out of the banking sector and into unsupervised networks."[199] Stablecoins, if

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[194] Id. at. ("It is important to note that this review explores stablecoins as a replacement for traditional currency and payment systems or prospective government issued alternatives like CBDC.").

[195] Catalini & Massari. 2021. ("But without robust legal and economic frameworks, there'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.").

[196] PRASAD, 11. 2021 ("A loosely regulated payment infrastructure that is entirely in the hands of the private sector might be efficient and cheap, but it could also freeze up under financial stress if the lack of government backing were to precipitate a loss in confidence.").

[197] Catalini & Massari. 2021. ("But there are also risks with private sector involvement, especially as stablecoins move beyond cryptocurrency trading and decentralized finance (DeFi).").

[198] Brainard, Digital Currencies, Stablecoins, and the Evolving Payments Landscape 7-8. 2019. ("In the extreme, widespread migration to one or more global stablecoin networks could disintermediate the role of banks in payments. If consumers and businesses reduce their deposits at commercial banks in favor of stablecoins held in digital wallets, this could shrink banks' sources of stable funding, as well as their visibility into transactions data, and thereby hinder banks' ability to provide credit to business and households.").

[199] Megan Greene, *Central Banks Need to Go Slow on Digital Currencies*(2021), *available at* https://www.ft.com/content/21e3affe-8c57-

relied on by a large number of economic actors as a means of payment and a store of value, may shrink the cash demand and affect banks' participation in the short-term funding markets and central banks' approach to implementing monetary policy.[200] The increasing share of payments made by private digital currency will mean government-issued money faces market competition from private issuers. As private digital money is not backed by a central bank, it is difficult for central banks to monitor such money supply.[201] The widespread use of private cryptocurrencies would likely impose challenges to the central bank's control over intermediate targets for its monetary policy. As another example, the financial distress of a financial institution that "acts as reseller/market-maker of" a stablecoin may affect confidence in the value of that stablecoin (confidence effects); a possible failure of a stablecoin could also expose the financial institutions involved in this stablecoin to confidence effects.[202] Libra may bring more challenges as the first global stablecoin.

The impact of a stablecoin on financial stability would be greater if it serves as a store of value besides its function as a means of payment.[203] New digital currencies and their underlying technology offer the possibility of parcelling out the functions of money (a unit of

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4bac-b9c5-21b645e93d7c. ("Cryptocurrencies and fintech firms threaten to shift payments, deposits and loans out of the banking sector and into unsupervised networks.").

[200] *See* See, e.g., Brainard, Digital Currencies, Stablecoins, and the Evolving Payments Landscape 8. 2019;Schwarcz, DUKE LAW SCHOOL PUBLIC LAW & LEGAL THEORY SERIES NO. 2021-09, 42 (2021). ("If a large share of domestic households and businesses come to rely on a global stablecoin not only as a means of payment but also a store of value, this could shrink demand for physical cash and affect the size of the central bank's balance sheet. The central bank's approach to implementing monetary policy may be complicated to the extent that banks' participation in short-term funding markets is affected.").

[201] *See* James Chen, *Private Currency*, Investopedia (June 11, 2021), https://www.investopedia.com/terms/p/private-currency.asp [https://perma.cc/Q7HJ-DT73] (defining and discussing private currency).

[202] Financial Stability Board, 13. 2020. ("Moreover, close linkages to financial institutions might also expose a GSC to adverse confidence affects, such as when a financial institution that acts as reseller/market-maker of the GSC arrangement comes under financial distress. The reverse may also be true—the potential failure of a GSC might expose the financial institutions involved in the GSC arrangement to adverse confidence affects.").

[203] *See generally* id. at. (discussing the wide ranging effects of adopting stablecoins as a store of value).

account, a medium of exchange, and a store of value).[204] One may argue that stableoins could be a medium of exchange and be used for moving value. [205] Diem also has "the potential to become systemic – a characteristic Bitcoin and its progeny always lacked": a global stablecoin along with a global electronic payment network and digital identification framework would effectively compete with state-issued money and current payment systems at the domestic and international levels.[206] There are concerns that stablecoin issuers could be too big to fail if the regulatory responses are not timely.[207] Moreover, Libra is to "shift substantial control of monetary policy from governments [particularly of poor countries] to the Libra Association", and Libra's international nature makes it difficult for a state to impose capital control and prevent capital flight.[208] To some extent, the Libra Association might effectively exercise core central bank powers without the legally mandated public responsibilities and oversight framework of the Federal Reserve Act of 1913. Although central banks have been blamed for the cause of global financial crisis or monetary policy failure, it is not easy for the Libra Association to be equipped with regulatory capability as a global central bank or global financial regulator.[209] It has been observed that "a non-state competitor currency poses major

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[204] *See* PRASAD, 11. 2021. (demonstrating that different forms of money, such as Fiat money, can serve various other purposes such as store of value or unit of account).

[205] Catalini & Massari. 2021. ("Even with … limitations … true stablecoins have utility as a medium of exchange.").

[206] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 22 (2020). (arguing that Libra, a global stablecoin combined with global electronic payment and digital identification network could compete with common currency).

[207] Gorton & Zhang, 6 (2021). ("If policymakers wait a decade, stablecoin issuers will become the money market funds of the 21st century—too big to fail—and the government will have to step in with a rescue package whenever there's a financial panic.").

[208] Zetzsche, et al., UNIVERSITY OF NEW SOUTH WALES LAW RESEARCH SERIES UNSWLRS 19-47, 23 (2019). ("Libra will insert a private company between national central banks and the citizens they are supposed to serve. Furthermore, once well established, Libra's global nature will mean capital controls will no longer be a policy measure available to the government to prevent capital flight in times of severe economic uncertainty.").

[209] *Id.* at 24 ("The world's major financial regulators need time to assess and regulate Libra—expect them to create it by slowing Libra's growth in many ways—and if that do not—watch the global financial system become far more unstable.").

monetary policy risks to financial stability as it may well limit the effectiveness of the liquidity provider of last resort function of central banks."[210] Following this logic, when stablecoins are widely used in the world, the financial instability of the international monetary system (such as market volatility) could be an issue if proper regulation is not in place.[211] Stablecoins may affect central banks' capacity to control monetary policy and "undermine confidence in the value or operational continuity of currencies, which could threaten international monetary and financial stability."[212]

Regulatory responses are needed to ensure stability. To illustrate, global stablecoins may be regulated by "using inventive public-private partnerships to protect the value of these stablecoins" and the requirements to include "secure hardware technology as well as additional security mechanisms in addition to cryptographic protections".[213] According to G7 Finance Ministers and Central Bank Governors' Statement on Digital Payments, global stablecoin projects need to "adequately [address] relevant legal, regulatory, and oversight requirements through appropriate design and by adhering to applicable standards."[214]

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[210] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 26 (2020). (arguing that global stablecoins pose financial risks because they can be leveraged very rapidly, and operational risks can affect the entire global economy).

[211] *See generally* Ross P. Buckley et al., *Sovereign digital currencies: Reshaping the design of money and payments systems*, 15 J. of Payments Strategy & Sys. (Nov. 27, 2020) (discussing the impact and regulatory importance of various development in sovereign currencies and the adoption of stablecoins).

[212] Schwarcz, DUKE LAW SCHOOL PUBLIC LAW & LEGAL THEORY SERIES NO. 2021-09, 1 (2021). ("If widely used, stablecoins also could impair central banks' ability to control monetary policy and possibly undermine confidence in the value or operational continuity of currencies, which could threaten international monetary and financial stability.").

[213] Id. at, 8, 43–44. (showing that stablecoins, if widely used, have more potential to both revolutionize and threaten global financial stability and thus require more regulation to ensure financial stability).

[214] Press Release, U.S. Dep't of the Treasury, *G7 Finance Ministers and Central Bank Governors' Statement on Digital Payments*(2020), *available at* https://home.treasury.gov/news/press-releases/sm1152. ("Payment services should be appropriately supervised and regulated to address challenges and risks related to financial stability …").

As discussed below, strong legal underpinnings would lay a solid foundation for the use of global stablecoins in different states.[215] That said, Libra is a moving target and its development deserves attention. In the latest development, a digital Libra dollar coin is to "be issued only when, for example, an actual US dollar is deposited into the Libra reserve."[216] This full backing of Libra now suggests that it "will have no monetary policy implications because it will not involve the creation of any new money," while concerns remain that Facebook might issue units of Libra based on its own massive resources instead of fiat currencies.[217]

B. The Nature and Regulation of a Global Stablecoin

Despite the benefits brought by a stablecoin, there are uncertainties regarding the regulation of Diem as a global stablecoin.[218] Stablecoins have advantages, such as helping governments to "run conditional cash transfer programs (including sending stimulus money)," and providing "lower-cost, safe, real-time, and more competitive payments."[219] They also face risks (e.g., "operational losses, asset price declines, or a run"[220]) and different consideration in

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[215] Financial Stability Board, 9. 2020. (stating that egal protocols provide stablecoins with reliable value because regulations react in response to supply and demand).

[216] PRASAD, 9. 2021.("A digital Libra dollar coin will be issued only when, for example, an actual US dollar is deposited into the Libra reserve.").

[217] *Id. at.*("The full backing Libra enjoys suggests that it will provide a stable store of value—hence the moniker—stablecoin—and will have no monetary policy implications because it will not involve the creation of any new money. Central bankers remain concerned, however, that Facebook could one day deploy its massive financial clout to issue units of Libra backed by its own resources rather than by reserves of fiat currencies.").

[218] Scott Jeffries, *Diem Coin: What You Need to Know*, GOBANKINGRATES (June 11, 2021), https://www.gobankingrates.com/investing/crypto/what-is-diem-coin/ [https://perma.cc/U7TR-G3HQ] ("Despite the benefits brought by a stablecoin, there are uncertainties regarding the regulation of Diem as a global stablecoin.").

[219] Catalini & Massari. 2021.

[220] *Id. at.* 5 ("Any material legal uncertainty for true stablecoins could be addressed by incremental changes to existing law. As currently being considered, true stablecoin regulation should include: requirements for permissible reserve assets and for the issuer to honor direct redemption claims; and limits on risky maturity transformation activities. Laws that bolster reserve

regulation. There are different attitudes towards Diem.[221] It seems unlikely that Diem would be accepted by China at least in the short term. From China's perspective, it seems that Libra could have a major impact on China's domestic payment system, foreign exchange management, and cross-border capital flows.[222] In other jurisdictions, global stablecoins may face regulatory issues regardless of scale as a regulatory vacuum exists alongside uncertainties regarding the legal status of stablecoins as a money equivalent, securities or other characterisation issues, and governance queries. Other issues include financial integrity, integrity and efficiency of payment systems, cyber risk, market integrity, data protection, consumer and investor protection, tax compliance, the prevention of financial crimes, and issues specific to global stablecoins (possibly affecting fair competition, financial stability and monetary policy transmission).[223] Envisaging domestic currency stablecoins linked in an international basket, Libra "aims at being regulated by a lead regulator and international supervisory cooperative approaches (with supervisory colleges)," and "for the first time, the technology, capital and scale now exist to potentially challenge the dominant paradigm that central banks issue and control currencies."[224]

Essentially, Diem's legal characterization is crucial for regulation and will have different regulatory implications.[225] Regulation can hardly go forward without confirming its classification under

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segregation and coin holder claims in bankruptcy or insolvency should be considered.").

[221] Browne, *supra* note 21 ("Formerly known as Libra, Facebook's vision for a digital currency was met with a severe backlash from regulators when it was first announced in June 2019, with central bankers and politicians worried it could undermine sovereign currencies like the dollar, enable money laundering and infringe on user's privacy.").

[222] Jinze & Etienne, *supra* note 94 ("These two speeches echoed the former governor of the PBoC Zhou Xiaochuan's call last month that Libra posed a threat to China's domestic payment systems and to the national currency.").

[223] G7 WORKING GROUP ON STABLECOINS, *supra* note 39, at 5–16 (stating that all of the aforementioned risks arise due to the implementation of global stablecoins.).

[224] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 27-28 (2020).

[225] G7 WORKING GROUP ON STABLECOINS, *supra* note 39, at 5–6. ("However, stablecoins and the underlying technical and contractual arrangements may vary significantly, and the applicable legal regime depends crucially on the particular design and characterisation.").

existing legal and regulatory frameworks, or creating an altogether new regime to address the specificities of this private, digital currency.[226] Different regulators may have different views regarding the nature or categorization of Libra: is it a commodity, security, or some other instrument?[227]

Swiss and U.S. law provide good examples, as they are closely related to Diem—the U.S. is a world leading economy where Diem Association moves to and Switzerland is where Libra Association was based.[228] The Federal Reserve "calls for a comprehensive regulatory framework for stablecoins".[229] Due to the interconnected financial markets, the regulation of Diem may also have effects on other economies.[230] Swiss law provides a primary example to illustrate the possible regulatory issues related to Diem even if Diem has withdrawn the application from FINMA. According to FINMA, the treatment of stablecoins follows the current regulatory approach "for blockchain-based tokens: the focus is on the economic function and purpose of a token ('substance over form') and follows the tried and tested principle of 'same risks, same rules', while taking into account the specific features of each project."[231] Various regulations may apply to stablecoins, including those on money laundering, securities trading,

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[226] *Id.* at 5-6. ("However, stablecoins and the underlying technical and contractual arrangements may vary significantly, and the applicable legal regime depends crucially on the particular design and characterisation.")

[227] Claire Williams, *What is Libra, Anyway? Washington Weighs Cryptocurrency's Regulatory Possibilities*, MORNING CONSULT (Sept. 22, 2021), https://morningconsult.com/2019/07/22/what-is-libra-anyway-washington-weighs-cryptocurrencys-regulatory-possibilities/ [https://perma.cc/KE84-AVGT] ("Libra, which some have argued is essentially backed by a pool of investments, could be regulated as a security or as an exchange-traded fund, placing the Securities and Exchange Commission as its primary overseer. Unlike other overseers, like the Commodity Futures Trading Commission the SEC doesn't have a strong track record welcoming new financial products and would likely be more strict with Libra, several financial policy experts say.").

[228] Browne, *supra* note 21 ("Facebook-backed digital currency project Diem said Wednesday it has withdrawn its application for a Swiss payment license and will instead shift its operations to the United States … Diem said it plans to move its operational headquarters from Geneva to Washington, D.C.").

[229] Catalini & Massari. 2021.

[230] G7 WORKING GROUP ON STABLECOINS, *supra* note 39, at 12 ("A disruption to a GSC may ultimately affect the real economy in multiple countries.").

[231] FINMA, Supplement to the Guidelines for Enquiries Regarding the Regulatory Framework for Initial Coin Offerings (ICOs). 2019.

banking, fund management, financial infrastructure, tax, competition, and data protection.[232] As recognized by FINMA, the classification of stablecoins under Swiss financial market regulation may not necessarily work in other states.[233]

As far as the US law is concerned, if Diem is considered by the US regulators to be a cryptocurrency, it will probably be classified by the Internal Revenue System as a commodity.[234] This classification would have tax implications, with requirements for Facebook to file income tax documents and keep track of the cost-basis math on behalf of its customers, essentially "increasing the cost of using [Libra] beyond any utility."[235] The US government already has legal and policy tools to regulate Diem's widespread usage, via the tax treatment of cryptocurrencies and requirements for payment processors, in the form of KYC/AML laws.[236] One acquiescence Facebook has made to these laws is switching Libra to a permissioned-based system, where node validators are known, meaning Libra transactions are unable to maintain pseudonymity if they meet KYC/AML requirements.[237] This move is generally viewed as a win for consumer protection, as Nicholas Weaver argues, true financial privacy is "a vehicle for bad outcomes," especially

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[232] FINMA, *supra* note 6 ("Money laundering, securities trading, banking, fund management and financial infrastructure regulation can all be of relevance . . . Other questions raised in the context of the Libra project, such as those relating to tax law, competition law or data protection law").

[233] FINMA, Supplement to the Guidelines for Enquiries Regarding the Regulatory Framework for Initial Coin Offerings (ICOs). 2019.

[234] Nicholas Weaver, *Facebook's Cryptocurrency: Stop it Before It Starts*, LAWFARE (June 19, 2019), https://www.lawfareblog.com/facebooks-cryptocurrency-stop-it-it-starts [https://perma.cc/B36U-RXL9] ("A true cryptocurrency such as Bitcoin or Libra is considered property by the Internal Revenue Service.").

[235] *Id.*

[236] *See* Jonathan Keane, *Facebook's Diem Exits Switzerland in Latest Shake-up*, SILICONREPUBLIC (May 14, 2021), https://www.siliconrepublic.com/business/diem-facebook-cryptocurrency-exits-switzerland [https://perma.cc/B234-2HKS] (acknowledging that the United States has the full capacity and technology to regulate Diem).

[237] Roshan Srinivas, *Libra by Facebook: Will the Cryptocurrency by the Tech Giant be Really a Thing for Us in the Future?*, THE STARTUP (Oct. 18, 2021), https://medium.com/swlh/libra-by-facebook-11fdd05e56e3 [https://perma.cc/9DVX-84B9] (detailing that Libra, unlike Bitcoin, allows a certain degree of tracking regarding its transactions).

at a company like Facebook which has been criticized for misusing user data.[238]

Libra does not seem to meet the conditions of e-money, since "it does not embody a claim of its holders against the Libra Association."[239] If it were treated as a transferrable security, both the Libra Association and other entities engaged in providing investment services through Libra Coins would fall under the jurisdiction of the Markets in Financial Instruments Directive.[240] If Libra were categorized as a virtual currency, under the Fifth Anti-Money Laundering Directive, Calibra and its authorized resellers would become subject to the Directive's anti-money laundering and counter-terrorism financing obligations, as well as its registration requirement.[241]

The classification of digital currencies depends "partly on the functional use of the digital currency and partly on the priorities of various lawmakers and regulatory agencies that have the authority to

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[238] *See* Elizabeth Lopatto, *Libra, Explained,* PRODUCTIVITY EXPLAINED https://productivityhub.org/2019/07/06/libra-explained/ [https://perma.cc/4GHU-Q6XL]; See, e.g., *Facebook Ad Campaign Helped Donald Trump Win Election, Claims Executive*, BBC(2020), *available at* https://www.bbc.com/news/technology-51034641;Jim Waterson, *Secretive Hard-Brexit Facebook Campaign Got 1m Responses*, The Guardian(2019), *available at* https://www.theguardian.com/politics/2019/apr/23/secretive-hard-brexit-facebook-campaign-got-1m-responses;Emily Price, *The EU Could Hit Facebook With Billions in Fines Over Privacy Violations*, Digital Trends(2019), *available at* https://www.digitaltrends.com/social-media/facebook-gdpr-decision/.(discussing the many fines imposed on Facebook by the European Union under EU's General Data Protection Regulation).

[239] Yves Mersch, *Yves Mersch: Money and Private Currencies - Reflections on Libra*(2019), *available at* https://www.bis.org/review/r190902a.pdf.

[240] Fergus Bolster et. al., *Regulation of ICOs in Ireland: An Overview of the Legal, Tax and Regulatory Position*, MATHESON (Oct. 10, 2018) (explaining that depending on how digital assets are structured, they could fall in the category of "transferable securities," which is governed by the Markets in Financial Instrument Directive).

[241] Jennifer Hanley-Giersch, Virtual Currencies—Regulation and Terrorist Financing Risks, ACAMS TODAY (Aug. 24, 2020), https://www.acamstoday.org/virtual-currencies-regulation-and-terrorist-financing-risks/ [https://perma.cc/U6HP-PE7K] (finding that virtual currencies under the Fifth Anti-money Laundering Directive, virtual currencies are obligated to be in compliance with anti-money laundering initiatives).

regulate it."[242] For instance, in 2017, Jay Clayton, then the Chairman of the Securities and Exchange Commission, released a statement on digital currencies and initial coin offerings: "Tokens and offerings that incorporate features and marketing efforts that emphasize the potential for profits based on the entrepreneurial or managerial efforts of others continue to contain the hallmarks of a security under U.S. law."[243] These guidelines clarify that digital currencies that function as securities will be subject to U.S. securities law, but remain vague on how a product should be differentiated between a digital currency and a security.[244]

Fundamental questions arise regarding what a functional and effective cryptocurrency regulatory environment might look like, including: what approach achieves the right balance between functional and risk-based regulation? What approach will last beyond the next cycle of technological innovation? Also, "legal clarity on the nature of the claim to all participants in the stablecoin ecosystem, such as coin holders and issuers" is regarded as crucial for the regulation of global stablecoins by different jurisdictions.[245] Acknowledging the deficiencies in existing legislation to regulate digital currencies points to the need for collaboration and coordination across multiple regulators, as well as the clear need to create a dedicated authority to address digital currencies. There are suggestions in stablecoin regulation, including "requirements for permissible reserve assets and for the issuer to honor direct redemption claims; and limits on risky maturity transformation activities", and rules that strengthen "coin holder claims in bankruptcy or insolvency."[246] Depending on the jurisdiction, specific regulatory issues range from licensing requirements under banking and financial

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[242] Michael Held, *U.S. Regulations and Approaches to Cryptocurrencies*(2019), *available at* https://www.bis.org/review/r191212d.pdf.

[243] Jay Clayton, *Statement on Cryptocurrencies and Initial Coin Offerings*(2017), *available at* https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11.

[244] *See When Is a Crypto Asset a "Security," and Why Does That Matter? (Part I)*, WINSTON & STRAWN LLP (Jan. 17, 2019), https://www.winston.com/en/crypto-law-corner/when-is-a-crypto-asset-a-security-and-why-does-that-matter-part-i.html [https://perma.cc/3GVH-NGQV] (illustrating that there is not a well-established definition to describe and differentiate a digital currency and a security as these factors differ between different courts and regulators).

[245] G7 Working Group on Stablecoins, iii (2019).

[246] Catalini & Massari. 2021., *supra* note 7.

market infrastructure law,[247] anti-money laundering, and consumer protection, to market competition and bank-like risks. To illustrate, bank-like risks may arise from additional services of Libra (possibly like single-currency stablecoins) that could pose increased risks and would be subject to extra requirements than those for payment systems.[248] To address bank-like risks, Libra is subject to bank-like regulatory requirements such as "capital allocation (for credit, market and operational risks), risk concentration and liquidity as well as the management of the Libra reserve."[249] Relatedly, stablecoin issuers' reserve assets should be isolated from their other assets, which could mean that coin holders would be prioritized over other creditors in the case of bankruptcy or insolvency.[250] Other examples of specific regulatory issues can be provided here, including consumer protection and competition. For consumer protection, it remains to be seen whether Libra would offer consumer protections that are comparable with bank accounts, and what the recourse will be for consumers if their interests are affected (as they seemingly lack the rights to the stablecoins' underlying assets) and how their data (including personally identifiable information) is to be stored and used.[251] Market dominance may lead to risks to both competition and innovation.[252] Moreover, one concern over access to Libra is that, as it would be a currency issued by a private company, it would not receive the same level of regulatory scrutiny as do many banks (which cannot easily ban citizens from accessing their basic financial services).[253] Furthermore, there are no regulated financial entities, like banks and fund managers, in the mix of Libra Association members.[254] Libra users' legal options could also be limited.[255] That said, Diem is working with Silvergate Bank to issue a

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[247] FINMA, Supplement to the Guidelines for Enquiries Regarding the Regulatory Framework for Initial Coin Offerings (ICOs). 2019.
[248] FINMA, Libra Association: FINMA Licensing Process Initiated. 2020.
[249] FINMA, FINMA Publishes 'Stable Coin' Guidelines. 2019.
[250] Catalini & Massari. 2021.
[251] Brainard, Digital Currencies, Stablecoins, and the Evolving Payments Landscape 5-6. 2019.
[252] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 26 (2020).
[253] *See* FINMA, *supra* note 6, at 17 ("The survey findings highlight that most jurisdictions do not currently have regulatory regimes specific to crypto-assets in general or stablecoins in particular.").
[254] *Id.* (discussing Libra's regulatory capabilities.)
[255] *Id.* (discussing Libra customer's lack of ability to recover and that Libra management should bear the risk of loss of capital, similarly to insured banks).

U.S. dollar-linked stablecoin.[256] Here Silvergate is to be "the formal issuer of the Diem USD stablecoin" and manage the reserve backing the token, while Diem Networks US is to "run the Diem Payments Network and register as a money services business with the Financial Crimes Enforcement Network (FinCEN)."[257]

Domestically, this involves cross-agency and cross-sector regulation given the wide-ranging issues involved in Diem (e.g., data and technology). [258] It may require efficient coordination among different domestic regulators. Internationally, regulatory cooperation is needed. Anti-money laundering law provides a prime example for international regulatory cooperation.[259] To ensure market integrity, key parties may be located across the globe and need to follow various jurisdictions' anti-money laundering laws.[260]

Given the possible global coverage and wide use of Diem, the fluctuation of Diem may affect the international financial system and the world economy. However, "supervisory colleges do not exist for all types of financial services provided by" global stablecoins like Libra.[261] The absence of a proper regulatory structure is a significant challenge. As it is hard to reach a global consensus on the regulation of Diem, this is likely to lead to different regulatory approaches to Diem in different jurisdictions. Therefore, it is crucial to explore a holistic approach to the regulation of global stablecoins, which addresses possible gaps in national regulatory frameworks and helps to "reduce opportunities for cross-sectoral and cross-border regulatory arbitrage."[262] It would be meaningful to, inter alia, promote competition, improve access to the financial system, and reduce transaction costs.[263] The regulation would involve, inter alia, enhanced international collaboration, information

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[256] De. 2021.
[257] Id. at.
[258] *Id.* (discussing Diem's registration with FinCEN and their prior lack of regulatory approval across Swiss agencies prompting their rebrand from Libra to Diem.).
[259] Brainard, *supra* note 25, at 5 ("Libra's business model is inherently cross-border, and, as such, each participant in the system deemed to be a financial institution would need to ensure compliance with each national jurisdictions' anti-money-laundering laws.").
[260] Brainard, Digital Currencies, Stablecoins, and the Evolving Payments Landscape 5. 2019.
[261] Didenko et al., *supra* note 69, at 25.
[262] Banerjee, G20 DIGEST, 27 (2020).
[263] Catalini & Massari. 2021.

sharing between states, and the application of the principle of "same business, same risk, same rules".[264]

C. The Effects on International Monetary Order

Diem and China's CBDC, if implemented, can be expected to reshape the international monetary system. Albeit in their rudimentary stages, Diem and China's CBDC are game changers for the international financial system. For instance, Libra is one among several global stablecoins that may carry long-term implications for the international monetary system, such as currency substitution, challenges to monetary sovereignty, and concerns around fair competition and anti-trust policy (e.g., those related to payments data).[265] Due to systemic risks, stablecoins could affect some economies more significantly than others, "depending on the state of development of their existing financial and payment systems, the stability of their currencies and their level of financial inclusion, among other factors."[266] Broadly speaking, digital currencies may increase the volatility of international capital flows and exchange rates.[267] The benefits of FinTech innovations may be "captured largely by the wealthy as a result of disparities in financial literacy and digital access".[268] It is hard, if not impossible, to provide an exhaustive list of the potential effects of Diem and China's CBDC on the international monetary order. The following part focuses on the major effects in view of the possible relationship between Diem and China's CBDC, which merit careful research and monitoring.

First, there could be competition among different currencies including CBDC, Diem and other digital currency (like Bitcoin).[269] Given new digital currencies and their underlying technology, it is possible to parcel out the functions of money and this has created

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[264] Banerjee, G20 DIGEST, 27 (2020).

[265] G7 WORKING GROUP ON STABLECOINS, *supra* note 39, at iii ("They could also have implications for the international monetary system more generally, including currency substitution, and could therefore pose challenges to monetary sovereignty. GSCs also raise concerns around fair competition and antitrust policy, including in relation to payments data.").

[266] G7 Working Group on Stablecoins, iii (2019).

[267] PRASAD, 11. 2021.

[268] Id. at, 21.

[269] See, e.g., Hrnjic. 2020;Wu Tong & Chen Jiayou, *A Study of the Economic Impact of Central Bank Digital Currency under Global Competition*, CHINA ECONOMIC JOURNAL 1, 6 (2021).

competition for fiat currencies in certain dimensions.[270] Stablecoins could "rival[] national currencies of smaller economies, as well as those with less credible central banks and profligate governments."[271] Meanwhile, it remains unclear "whether a CBDC that inherently carries an official imprimatur could stifle private sector–led financial innovations."[272] A central bank is probably unwilling to risk lagging behind others on the CBDC development given its strategic implications in the digital era.[273] Such competition is possible because the users may choose the option that works best for them, although the Libra White Paper indicates that Libra would "provid[e] a clear path for seamlessly integrating" CBDCs.[274] Meanwhile, China's plan of launching CBDC appears to be further pushed by Libra given Libra's impact on, or detriment to, sovereignty over currency (possibly due to, inter alia, "its separate unit of account and potential for facilitating capital flight").[275] As indicated above, Libra is likely to profoundly affect China's domestic payment system, foreign exchange management and capital control.[276] Libra and China's CBDC "ha[ve], or [are] likely to have, a *systemic* effect on domestic and international payment systems" and are likely to, for the first time in the world economy, "enable the merger of monetary and payment systems" through technology.[277]

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[270] *See* PRASAD, 11. 2021.
[271] *Id.* at 21.
[272] *Id.* at 21.
[273] Chorzempa, CHINA ECONOMIC JOURNAL, 3 (2021).
[274] *See* LIBRA, *supra* note 12, at 2.
[275] Chorzempa, *supra* note 116, at 2; *See also* Dirk A. Zetzsche et al., *Decentralized Finance*, 6 J. OF FIN. REGULATION 172, 201 (2020) (stating that China's plan to introduce a new digital currency was "partially in response to initiatives such as Facebook's Libra"); Chen Jia, *Central Bank Unveils Plan on Digital Currency*, CHINA DAILY (July 9, 2019), http://www.chinadaily.com.cn/a/201907/09/WS5d239217a3105895c2e7c56f.html [https://perma.cc/96ZJ-V5P8] (describing the concern that if Libra develops into a "type of credit money … it would challenge central banks' monetary sovereignty"); Kiran Stacey & Hannah Murphy, *Zuckerberg Warns Blocking Libra Will Be Boon to China Tech*, FIN. TIMES (Oct. 23, 2019), https://www.ft.com/content/28c600de-f5a1-11e9-9ef3-eca8fc8f2d65 [https://perma.cc/YK76-HMBY] (noting Mark Zuckerberg's concern that "China is moving quickly with the launch of a similar idea" to Libra).
[276] Jinze & Etienne, *supra* note 94 (finding that Libra "could have a major impact on China's foreign exchange management and cross-border capital flows," while also threatening China's domestic payment systems).
[277] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 2, 4 (2020).

Second, there could be tensions between CBDC and Libra. Central banks and the Libra Association are likely to obtain much more government securities as assets against which to issue new liabilities in the form of CBDC and to support the value of Libra respectively.[278] Researchers have claimed the primary macroeconomic effect of Libra is likely to be on the level of interest rates and the market for sovereign debt.[279] One potential scenario is that if Libra is widely adopted, demand for its backing securities would increase, thereby increasing their prices and reducing their rates of return.[280] Economies with currencies inside the Libra basket would experience raised exchange rates and lower interest rates.[281] The opposite would be true for economies with currencies outside of the Libra basket, especially if their residents sell local currency-denominated assets for Libra tokens, which would reduce overall demand for local currency-denominated assets.[282] This scenario would be particularly significant in developing economies with a history of unstable and inflationary local currencies.[283]

Third, Libra and China's CBDC may challenge the dominant role of the U.S. dollar. Libra's impact on the U.S. dollar may partially explain why US regulators have hit the brakes on Libra.[284] CBDC may increase the speed of circulation and reduce transmission costs for cross-border payments, thereby promoting the internationalization of the

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[278] *Id.* at 25.

[279] Joseph E. Gagnon & Gonzalo Huertas, *Could Facebook's Libra Affect National Economies and Interest Rates?*(2019), *available at* https://www.piie.com/blogs/realtime-economic-issues-watch/could-facebooks-libra-affect-national-economies-and-interest.

[280] *Id.* (stating that if Libra is broadly adopted, the demand for its backing securities would increase, "pushing up their prices and reducing their rates of return").

[281] *Id.*

[282] *Id.*

[283] *See id.* (arguing that these effects depend on "the choice of currencies and weights in the Libra Reserve basket as well as the size of the Libra Reserve, which in turn depends on the extent to which Libra is viewed as a safe and convenient investment, including in developing economies with a history of unstable and inflationary local currencies").

[284] *See* Gagnon & Gonzalez, *supra* note 279 (finding that the Libra Reserve basket will include the US dollar and that, as a result, the US economy will "experience upward pressure on exchange rates and downward pressure on interest rates").

renminbi if everything goes smoothly.[285] Looking into trade in the future, CBDC could work with "dematerialized trade documents" (e.g., digital contracts).[286] Interestingly, it is observed that "[t]he difference between Libra when it was announced and Diem when it eventually launches, from the standpoint of major currencies, is that Diem will not be a competitor for major currencies."[287] This is because Diem "has essentially been subjugated to central banks and regulators in those major jurisdictions."[288] However, it remains to be seen how Diem would operate in the future and what its implications eventually are for the dominant position of the U.S. dollar.

China's policy choices in the global monetary realm present a mixed picture, reflecting a pluralist approach.[289] On the one hand, China intends or even intervenes to support and stabilize the status of the U.S. dollar as the leading global reserve currency, especially in times of global financial crisis.[290] On the other hand, it has for a long time endeavoured to reform the global monetary system as a real revisionist.[291]

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[285] Jinze & Etienne, *supra* note 94 (finding that CBDC would increase the speed of and lower costs for cross-border payments, "ultimately promoting the internationalization of the renminbi").

[286] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 42 (2020).

[287] Arner, CALIFORNIA WESTERN INTERNATIONAL LAW JOURNAL, 247 (2021).

[288] *Id.* at 247.

[289] EVA PAUS ET AL., GLOBAL GIANT: IS CHINA CHANGING THE RULES OF THE GAME 237 (Eva Paus et al. eds., 2009) ("We begin by outlining the some of the conceptual and empirical 'pluralism' that characterizes the rising China discourse.").

[290] *See* Eswar Prasad, *The Dollar Reigns Supreme, By Default*, 51 FINANCE & DEVELOPMENT 34, 36 (2014) ("In fact, since 2000, emerging markets have added about $6.5 trillion to their reserve stockpiles, with China accounting for about half of this increase (see Chart 4)."); Jonathan Masters et al., *The IMF: The World's Controversial Financial Firefighter*, CFR (Sept. 8, 2021), https://www.cfr.org/backgrounder/imf-worlds-controversial-financial-firefighter [https://perma.cc/7NVF-V9KN]; Saheli Roy Choudhury, *The Yuan Hit an 11-Year Low This Week: Here's a Look at How China Controls Its Currency*", CNBC, August 28, 2019, https://www.cnbc.com/2019/08/28/china-economy-how-pboc-controls-the-yuan-rmb-amid-trade-war.html [https://perma.cc/8APQ-3AJT] (discussing China's control of their currency as compared to the dollar).

[291] *See* Randall Schweller, *Managing the Rise of Great Powers*, *in* ENGAGING CHINA: THE MANAGEMENT OF AN EMERGING POWER 1, 1–31 (Alastair Johnson & Robert Ross eds., 1999) (discussing the "revisionist" tendencies of rising national powers).

China appears to pursue changes in the system instead of a regime change,[292] meaning that its short or medium-term goal could be to preserve the U.S. dollar's dominance in the global financial realm while increasing the predominance of renminbi in a gradualist manner. China currently does not have the ability to define and set global standards as the global financial system is fixed by U.S.-centric global institutions.[293] As such, a more transformative approach may gradually arise. Notably, FinTech provides developing countries like China an opportunity to "leapfrog wealthier economies by rapidly adopting new and more efficient ways of conducting banking and financial transactions."[294] It has been observed that an objective of China's CBDC is to enhance the renminbi's turnover rate and internationalization (given, inter alia, arguably higher speed and lower costs for cross-border payment),[295] and China may further promote the international use of CBDC in the future through, inter alia, cross-border payment via mobile wallets, and the funding of the Belt and Road Initiative.[296]

The impact of China's CBDC on the international monetary system will be affected by various factors ranging from the credibility of the central bank to international interoperability and privacy protection. The performance of a currency (including CBDC) depends on the credibility of the issuing institution, and CBDC cannot "mask underlying weaknesses in central bank credibility or other factors, such as a government's undisciplined fiscal policies, that affect the value of central bank money."[297] The performance of China's CBDC remains to

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[292] Alastair Iain Johnston, *Is China a Status Quo Power*?, 27 INTERNATIONAL SECURITY 5, 56 (2003) (finding that China is more status quo oriented relative to the past).

[293] Jonathan Kirshner, *Same as It Ever Was? Continuity and Change in the International Monetary System*, 21 REVIEW OF INT'L POLITICAL ECON. 1007, 1010 (2014) ("As for the RMB, it is a long way off from offering any competition to the dollar …").

[294] PRASAD, 15. 2021.

[295] Binance Research (Jinze & Etienne), (2019). ("Cross-border payments: the CBDC would enable increased speed and lower costs for cross-border payment, ultimately promoting the internationalization of the renminbi.").

[296] Zennon Kapron, *China's Central Bank Digital Currency Will Strengthen Alipay And WeChat Pay, Not Replace Them*, Forbes(2020), *available at* https://www.forbes.com/sites/zennonkapron/2020/05/24/chinas-central-bank-digital-currency-will-strengthen-alipay-and-wechat-pay-not-replace-them/#418342086b69. ("Similarly, the DCEP could facilitate payments along China's Belt and Road Initiative (BRI).").

[297] PRASAD, 13. 2021.

be seen. Moreover, international interoperability will be crucial for Chinese CBDC's contribution to renminbi internationalization given the dynamics in the world economy.[298] China's CBDC initially will not be interoperable with foreign systems.[299] That said, China is reportedly working with the SWIFT through a joint venture that may explore the international use of China's CBDC.[300] As another example of China's efforts to explore international use of CBDC, the PBOC and Hong Kong Monetary Authority (HKMA) "were preparing to test the use of digital yuan for cross-border payments."[301] Privacy loss is also a major challenge. A retail CBDC will "expose[ ] new forms of sensitive information to CBDC operators" due to the limitations of existing privacy-enhancing technologies.[302] There are concerns that CBDC may negatively affect an individual's choice in payment systems and privacy, since the benefits of CBDC largely exist at the macro level.[303] This involves both domestic and international use of CBDC. The key is balancing privacy with selective permission "of data mining for end-user services, policymakers, and law enforcement investigations and interventions."[304]

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[298] Stephen O'Neal, *Global Compatibility Is a Key Factor in the CBDC Race, Says Expert*(2020), *available at* https://cointelegraph.com/news/global-compatibility-is-a-key-factor-in-the-cbdc-race-says-expert.[https://perma.cc/4J92-7LXV] ("CBDCs will have to be internationally interoperable to become globally adopted, says a Hong Kong University expert.").

[299] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 38 (2020). ("The Digital Yuan initially will not replace cash and will be interoperable with existing domestic payment systems but not foreign systems; although foreign participants in China will be able to use it.").

[300] Reuters Staff, *SWIFT Sets up JV with China's Central Bank*(2021), *available at* https://www.reuters.com/article/china-swift-pboc-idUSL1N2KA0AK.("SWIFT, the global system for financial messaging and cross-border payments, has set up a joint venture with the Chinese central bank's digital currency research institute and clearing centre, in a sign that China is exploring global use of its planned digital yuan.").

[301] Zhang. 2020.

[302] Allen et al., *supra* note 122, at 3.

[303] Jiu Xie, *What is E-CNY Will You Give up Wechat and Alipay and Choose It?*(2020), *available at* https://finance.sina.com.cn/wm/2020-10-12/doc-iivhuipp9187884.shtml. (noting that digital currency's macro-level emphasis invariably affects a user's right to privacy despite regulatory attempts to achieve "controlled anonymity").

[304] Allen, et al. 2020. ("A CBDC will also in some way need to address an innate tension between privacy and transparency, protecting user data from

Many of these issues depend on which law applies to international payments, which is not clear at this stage.[305]

IV. Regulatory Outlook: Regulatory Challenges and Possible Solutions

Diem and China's CBDC are distinctly different from each other, and involve complex technical and legal issues. Regulators appear to "struggle to keep up with the coming rapid changes in financial markets as new and non-traditional financial platforms rise in importance, threatening banks and other existing financial institutions."[306] The key for the regulators in the era of disruptive finance is the proper risk and benefit balance.[307] It is crucial to understand the challenges arising out of new digital currencies. Due to network effects, the adoption of a technology or service by more users not only increases its value but also "makes it dominant and less vulnerable to competition," with the possible concentration of market power among certain actors including payment systems.[308] A major challenge to the regulation of emerging technology is how to reap a new technology's benefits while addressing its potential risks in the context that such risks can hardly be fully identified without the further development of technology.[309] There are different regulatory approaches to cryptocurrencies, ranging from "trying to co-opt the changes in a manner that serves their ends to resisting certain developments for fear of their engendering monetary and financial instability."[310] Essentially, regulatory arrangement are to decide whether and when the potential of new technology will be delivered.[311]

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abuse while selectively permitting data mining for end-user services, policymakers, and law enforcement investigations and interventions").

[305] Jinze & Etienne, *supra* note 94, at 16 ("despite one of the end goals from this digital currency initiative being to further internationalize the renminbi, it remains to be seen what legislation would apply on cross-border payments).

[306] PRASAD, 8. 2021.

[307] *See generally* id. at.

[308] *Id.* at 21.

[309] Gregory N. Mandel, *Regulating Emerging Technologies*, 1 LAW, INNOVATION AND TECHNOLOGY 75, 75 (2009). (noting social and regulatory quandary between leveraging a promising technology's "anticipated benefits while guarding against its potential risks").

[310] PRASAD, 11. 2021.

[311] Catalini & Massari. 2021. (noting that regulatory frameworks define if and when technology can meet its expectations).

Such challenges call for a shift from traditional reactive regulation to a proactive governance process, which is difficult as new technology usually faces "highly polarised debates," as well as both scientific and regulatory uncertainties.[312] An active approach may "help improve the risk-benefit trade-offs of Fintech."[313] Technology can enable "the merger of the monetary and payment systems."[314] Technology can also be used to harvest data. Diem and China's CBDC generate data, and involve new issues such as digital identity and data flow, allowing for some FinTech-type experiments in financial industries.[315] As discussed above, Diem and China's CBDC are different in terms of technological design.[316] Diem appears to use blockchain as its "backbone".[317] In contrast, it seems that China's CBDC does not heavily rely on blockchain technology although it may take advantage of blockchain in certain aspects (e.g., security).[318] Essentially, different technological designs mean different paths of digital currencies and may reflect different priorities.

In terms of structure, Diem and China's CBDC largely reflect a bottom-up and top-down approach, respectively. They are likely to challenge existing financial regulation and traditional regulatory, fiscal and monetary policy in different ways. To illustrate, Diem and China's

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[312] *See* Mandel, *supra* note 309, at 76. (noting major obstalce to adoption of new technologies is how best to manage its development).

[313] PRASAD, 17. 2021. ("Still, an active approach could help improve the risk-benefit trade-offs of Fintech.").

[314] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 2 (2020) ("Under this model, for the first time in history, technology will enable the merger of the monetary and payment systems.").

[315] *See* Agustin Carstens, General Manager, Bank for Int'l Sys., Remarks at the Hoover Ints. Policy Seminar, Digital currencies and the future of the monetary system 11-14 (Jan. 27, 2021) (discussing the broader implications of data collection by digital currencies).

[316] *See generally* LIBRA, *supra* note 12 (discussing the technological structure of Diem/Libra); WORKING GROUP ON E-CNY RESEARCH AND DEVELOPMENT OF THE PEOPLE'S BANK OF CHINA, *supra* note 34.

[317] LIBRA, *supra* note 12, at 5 (one part of the Libra system is a "secure, scalable, and reliable blockchain as the technological backbone of the payment system").

[318] WORKING GROUP ON E-CNY RESEARCH AND DEVELOPMENT OF THE PEOPLE'S BANK OF CHINA, *supra* note 34, at 2 (considering the use of blockchain technologies, and stating CBDC's construction and function).

CBDC will have a profound impact on cash flows, monetary policy, and financial stability.[319]

As the first global stablecoin that has the potential to be widely used, Diem would likely make financial regulation and conventional regulatory tools less effective.[320] Big Tech and FinTech firms basically transform the financial market into a decentralized one involving new and non-conventional market players.[321]

However, there is currently no global regulatory regime which handles or coordinates a population akin to the scale of Facebook and WhatsApp's monthly userbase (2.4 billion and 1.5 billion, respectively[322]), plus its 7 million advertisers and 90 million small businesses.[323] It reveals the impact of private digital currency on international financial system and the world economy.[324]

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[319] *Compare* LIBRA, *supra* note 12, at 1–29 (describing Libra's transformative aspects on financial systems and policies) *with* WORKING GROUP ON E-CNY RESEARCH AND DEVELOPMENT OF THE PEOPLE'S BANK OF CHINA, *supra* note 34, at 2–3 ("Some commercial instituttions even plan to launch global stablecoins, which will bring risks and challenges to the international monetary system, payment and clearing system, monetary policies, and cross-border capital flow mangement and etc.").

[320] *See generally* LIBRA, *supra* note 12 (describing efforts to collaborate with regulators and address policy concerns.

[321] *See* WORKING GROUP ON E-CNY RESEARCH AND DEVELOPMENT OF THE PEOPLE'S BANK OF CHINA, *supra* note 34, at 2 ("Adopting blockchain and encryption technology, cryptocurrencies such as Bitcound are claimed to be decentralized and entirely anonymous. However … they can hardly serve as currencies used in daily economic activities.").

[322] Iwa Salami, *Libra: Four Reasons to Be Extremely Cautious about Facebook's New Currency* (2019), *available at* https://theconversation.com/libra-four-reasons-to-be-extremely-cautious-about-facebooks-new-currency-119123.

[323] *See* Facebook, *6m+ There Are More Than 6 Million Active Advertisers on Facebook.*(2021), *available at* https://www.facebook.com/iq/insights-to-go/6m-there-are-more-than-6-million-active-advertisers-on-facebook;Facebook, *Giving Small Businesses the Tools to Succeed on Facebook* (2019), *available at* https://www.facebook.com/business/news/giving-small-businesses-the-tools-to-succeed-on-facebook. [https://perma.cc/EY2U-UVJ9] (sharing data on Facebook's impact towards small businesses).

[324] Gorton & Zhang, *supra* note 17, at 36–39 (comparing public and private currencies).

The existing financial regulation is a centralized regulatory framework typically targeting banks and other financial institutions.[325] Typical market access rule and capital rules are traditionally designed to regulate banks and financial institutions.[326] Nevertheless, Big Tech companies are not financial institutions and seem to fall out of the scope of financial regulation, as they do not conduct financial businesses in the same way as traditional banks and financial institutions.[327] Even financial conduct rules do not seem to apply to Big Tech companies.[328] Gary B. Gorton and Jeffery Y. Zhang argue that privately produced monies such as Diem are subject to runs, and that stablecoin issuers, as "essentially unregulated banks", could be regulated as banks.[329] They observed that "[d]epositors" purchase and receive the number of stablecoins in exchange for each dollar deposited with the issuer, and supposedly may "redeem stablecoins at par and at will for cash, just like demand deposits and money market funds."[330] As stablecoin issuers are not regulated and "cannot rely on bank examiners," the transparency of stablecoins would be crucial in various aspects such as users' confidence in stablecoins. [331]

On the other hand, CBDC further enhances the role of the central bank in the economy. This is the case with e-CNY. By issuing CBDC, central banks are likely to be given greater power (such as

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[325] Michael Schmidt, *Financial Regulators: Who They Are and What They Do*, INVESTOPEDIA (Jan. 18, 2021), https://www.investopedia.com/articles/economics/09/financial-regulatory-body.asp [https://perma.cc/4PYG-SBDG] ("Regulatory bodies are established by governments or other organizations to oversee the functioning and fairness of financial markets and the firms that engage in financial activity.").

[326] *See Direct Market Access Controls*, FINRA (Oct. 16, 2019), https://www.finra.org/rules-guidance/guidance/reports/2019-report-exam-findings-and-observations/direct-market-access-controls [https://perma.cc/VA22-49W6] (discussing compliance and application of the Market Access Rule).

[327] *Faceook's moment of regulatory reckoning*, FIN. TIMES (Oct. 7, 2021), https://www.ft.com/content/f54b5a1e-9db2-4916-9783-e8cef6e916eb (Yet [Facebook has] no sectoral oversight, as applies to, for example, banking.").

[328] Juan Carol Crisanto & Johannes Ehrentraud, *The Big Tech Risk in Finance*, IMF (May, 2021), [https://perma.cc/manage/create?folder=7161-134576-134637-135313] (discussing the regulatory issues of growing Big Tech influence in finance).

[329] Gorton & Zhang, 1, 6 (2021).

[330] Id. at, 6.

[331] *See* id. at, 9.

"higher surveillance power over transactions and imposing negative interest rates") than before.[332] By stepping into the digital currency market, central banks are playing a dual role—not only a regulator but also a market player.[333] This may bring out a moral hazard problem complicating the regulatory landscape. It remains to be seen how CBDC is to be designed and used in the digital era, and how the central bank works with private entities regarding both the marketing of CBDC and its regulation.

The risks of using digital currency need to be identified and addressed by appropriate regulatory instruments. New regulatory issues emerge ranging from cyber security to financial consumer protection (e.g., privacy) and data flow, all of which require more sensible and innovative regulatory responses and tools. Data provides a primary example here.[334] Private players are likely to take advantage of their data-generator role, thereby affecting the regulator's chance of using data and regulating the use of data.[335] Therefore, private digital currency (like other FinTech sectors) becomes an extra-legal area where regulators have a blind eye in the darkness. This is the data privacy perspective of financial disruption.[336] For CBDC, central banks need to address many issues. For instance, how exactly will data (such as transaction data, also termed as "digital exhaust"[337]) be generated? What risks may arise at various stages of CBDC design and operation

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[332] Nabilou & Prüm, UNIVERSITY OF LUXEMBOURG LAW WORKING PAPER NO. 2019-014, 38 (2019).

[333] Raghuveera, *supra* note 171 ("Governments in advanced economies are exploring CBDCs as a means to curb the growth of private payment providers and cryptocurrencies, which they see as a competitive risk to central bank-issued cash.").

[334] *See id.*("[T]he exportation of CBDCs gives governments an even more powerful currency: data.").

[335] *See* Nabilou & Prüm, *supra* 172, at 38 ("Such multi-faceted challenges, coupled with cryptocurrencies' price volatility and their hybrid nature, which allows them to be used as a means of payment, investment, and access, have led to a surge of interest in studying cryptocurrencies among regulators ranging from financial crime enforcement agencies to banking, securities and commodity markets regulator.").

[336] G7 WORKING GROUP ON STABLECOINS, *supra* note 39, at 5–16 ("Policy issues around personal and financial data protection and privacy will grow increasingly important as more data are collected and used in the provision of financial services and machine learning and artificial intelligence techniques advance.").

[337] Raghuveera & Bray. 2020.

(including international use of CBDC)? How to regulate and work with private parties in CBDC regarding data (such as data quality,[338] data use, and sharing)? How to address potential risks in data security, management, and regulation (such as preventing privacy leakage)? How to address the tension between the privacy of end-user information and efficiency? Libra also faces many of these issues. For instance, Libra and China's CBDC are likely to face various challenges such as cyber security and privacy protection.[339] These regulatory issues cannot be addressed without technology. [340] However, Libra's technological design is not the same as China's CBDC.[341] Regulatory solutions to these issues are likely to vary.

Crucial regulatory principles are needed to manage risks. Given the fast-changing practice, at the early stage, principle-based regulation and technological neutrality would be useful for financial regulation.[342] Regulators' key task is to design more suitable regulatory tools to address pitfalls and risks of digital currencies. The regulators may take regulatory measures depending on the services or products provided by digital currencies (e.g., monetary, payments or securities), which is an activity-based approach with more specificity and flexibility. [343] Technological neutrality is to be respected and has been recognised by

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[338] Didenko, et al., EUROPEAN BANKING INSTITUTE WORKING PAPER SERIES 65/2020, 36 (2020) ("Tracing functionality would enhance the quality of data on the national economy compiled by central banks.").

[339] Binance Research (Jinze & Etienne), (2019). ("Furthermore, compared to decentralized cryptocurrencies, a highly centralized one could negatively impact financial privacy for all individuals. Several pending questions remain such as the requirement to open wallets, whether a third party could freeze assets and under what specific circumstances.").

[340] Raghuveera, *supra* note 171 ("CBDC development requires technical expertise.").

[341] Didenko et al., *supra* note 68, at 380 ("It is thus designed to address a number of issues specific to China but also of relevance to others.").

[342] *See* Catalini & Massari, *supra* note 9 ("Technology-neutral regulation that follows a "same risks, same rules" approach can lift quality standards and encourage competition between safe solutions.").

[343] Didenko et al., *supra* note 69, at 27 ("Third, there could be a variety of approaches which could be activity, institutional, or infrastructure based depending on the nature of the specific GSC. Activity based approaches would vary depending on the nature of the products and services being offered, whether monetary, payment, securities, etc. Cooperation and coordination on licensing, market access, supervision, resolution etc. would all be required.")

various regulators such as the European Central Bank[344] and FINMA.[345] It is important to protect depositors, creditors, and investors, and strike a balance between safety and efficiency.[346] In fact, safety and efficiency are two recurring challenges in the payment systems.[347] Adopting a "same risks, same rules" approach, technology-neutral regulation may improve quality standards and promote competition among different solutions.[348]

V. Conclusion

The future of digital currencies and the regulatory responses need to be closely and repeatedly examined. We are entering an era of disruptive change in finance, and these changes "are being wrought by new financial technologies."[349] Digital currencies use new financial technologies, which could "unleash major risks, including some that might currently not even be on the radar of regulators and that could end up hurting the economically underprivileged."[350] Both Diem and China's CBDC are moving targets, involving new and established entities. There are fundamental differences. They not only involve different technological designs but also are led by different actors (private entities and a central bank, respectively). China's CBDC is

[344] Yves Mersch, *Yves Mersch: An ECB Digital Currency—a Flight of Fancy?*(2020), *available at* https://www.bis.org/review/r200511a.pdf.("We are technology neutral").
[345] FINMA, Supplement to the Guidelines for Enquiries Regarding the Regulatory Framework for Initial Coin Offerings (ICOs). 2019.("Swiss financial market regulation is principle-based and technology-neutral").
[346] Didenko et al., *supra* note 69, at 18 ("Concerns endure about consumer and investor protection, in terms of a perceived lack of transparency and uncertainty around *underlying value*.").
[347] *Id.* at 10–14 ("Two broad policy objectives dominate payment system design: (i) safety (incorporating stability, integrity, customer and data protection concerns) and (ii) efficiency (including cost efficiency, competition and innovation").
[348] Catalini & Massari. 2021, *supra* note 7 ("Technology-neutral regulation that follows a "same risks, same rules" approach can lift quality standards and encourage competition between safe solutions.").
[349] PRASAD, 8. 2021 ("This time, the changes are being wrought by new financial technologies").
[350] *Id.* at 8.

public money while Diem is private money.[351] Both of them would likely generate a large volume of data and create more problems (e.g., the use of smart contracts which may involve financial stability issues). The rise of digital currencies is not only revolutionizing the payment system but also affecting world currencies, especially the U.S. dollar, which is facing challenges from Diem and CBDC. The rise of digital currencies may negatively affect the U.S. dollar's dominance as the global reserve currency.[352] That said, a digital dollar is also being considered by the US Congress in the COVID response legislative package.[353] Federal Governor Lael Brainard of the U.S. Federal Reserve points out that "[g]iven the dollar's important role, it is essential that the Federal Reserve remain on the frontier of research and policy development regarding CBDCs."[354] The Federal Reserve Bank of Boston is working with researchers at the Massachusetts Institute of Technology to "build and test a hypothetical digital currency oriented to central bank uses."[355] The possible digital dollar differs from China's CBDC. It seems that the US approach to CBDC may focus on its role as "a settlement asset for wholesale payment and settlement activity,"[356] while China's CBDC is likely to have a retail focus. The similarity, though on the surface, is that central banks are forced to step into the

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[351] Catalini & Massari. 2021., *supra* note 7 ("This is where CBDCs and stablecoins are strong complements, not substitutes. The public sector could focus on issuing digital coins and delivering on sound money, while the private sector could build rails and applications.").

[352] Brian Swint, *Carney Urges Libra-Like Reserve Currency to End Dollar Dominance*, BL NEWS (Aug. 23, 2019), news.bloomberglaw.com/banking-law/carney-urges-libra-like-reserve-currency-to-end-dollar-dominance ("An SHC could dampen the domineering influence of the U.S. dollar on global trade.").

[353] Jason Brett, *How Project Libra And COVID-19 Drove Digital Dollar Idea In Congress* (2020), *available at* https://www.forbes.com/sites/jasonbrett/2020/04/24/how-project-libra-and-covid-19-drove-digital-dollar-idea-in-congress/#3e5134702c51.("The idea of a digital dollar being considered in Congress has ignited the imagination and driven the conversation around a central bank digital currency in the United States.").

[354] Lael Brainard, *An Update on Digital Currencies* (2020), *available at* https://www.federalreserve.gov/newsevents/speech/files/brainard20200813a.pdf.

[355] *Id.*

[356] Brainard, Cryptocurrencies, Digital Currencies, and Distributed Ledger Technologies: What Are We Learning? 7. 2018.

field of digital currencies as both competing suppliers and competing regulators.

Essentially, digital currencies are crucial for the international monetary and financial system. Besides new benefits (e.g., efficiency), new challenges (e.g., hacking) may arise for financial innovation, financial markets, and financial regulation. New digital currencies and regulatory evolvement are likely to affect the business model of actors in financial markets such as commercial banks. For instance, commercial banks likely "find it difficult to continue collecting economic rents (outsize profits because of their dominant position) on some activities, such as international payments, that generate significant fees and cross-subsidize other activities."[357] New digital currencies also affect regulators and other stakeholders, like consumers. Many regulatory issues arise including competition issues in financial markets (such as the barriers for new actors in the payment sector), divergent regulatory requirements developed by different economies and related compliance costs, and the insurance of new digital currencies' contribution to sustainable development (e.g., addressing energy consumption issues). More efforts are needed to ensure that regulatory challenges will be properly addressed in the post-COVID-19 era.

Collaboration between national regulators and the cooperation of public and private actors will be crucial to addressing potential risks in relation to digital currency. This is particularly the case for financial regulation as there are roadblocks for efficient international regulatory cooperation (e.g., for stablecoins, "the definition of requirements for managing the reserve, and the governance around it, as well as for combating money laundering").[358] Looking into the future, the intended and unintended effects of digital currencies merit in-depth research and careful monitoring.

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[357] PRASAD, *supra* note 4, at 9.

[358] *See* FINMA, FINMA Publishes 'Stable Coin' Guidelines. 2019.