

AUGUST 2021

# China's Digital Yuan: An Alternative to the Dollar-Dominated Financial System

Rajesh Bansal and Somya Singh



---

# **China's Digital Yuan: An Alternative to the Dollar-Dominated Financial System**

Rajesh Bansal and Somya Singh

---

© 2021 Carnegie Endowment for International Peace. All rights reserved.

Carnegie does not take institutional positions on public policy issues: the views represented herein are the authors' own and do not necessarily reflect the views of Carnegie, its staff, or its trustees.

No part of this publication may be reproduced or transmitted in any form or by any means without permission in writing from Carnegie India or the Carnegie Endowment for International Peace. Please direct inquiries to:

Carnegie Endowment for International Peace  
Publications Department  
1779 Massachusetts Avenue NW  
Washington, DC 20036  
P: +1 202 483 7600  
F: +1 202 483 1840  
[CarnegieEndowment.org](http://CarnegieEndowment.org)

Carnegie India  
Unit C-5 & C-6, Edenpark,  
Shaheed Jeet Singh Marg  
New Delhi—110016, India  
P: +011 4008687  
[CarnegieIndia.org](http://CarnegieIndia.org)

This publication can be downloaded at no cost at [CarnegieIndia.org](http://CarnegieIndia.org).

# + CONTENTS

Abbreviations	v
Summary	1
Introduction	3
Why the Current Dollar-Centric Monetary System Does Not Work for China	3
Digital Yuan: China's Latest Trump Card?	4
Advantages of CBDCs in Cross-Border Payments	7
Digital Yuan: A Tool for Internationalization	10
China's Past Efforts to Internationalize Its Currency	15
China Is Not the Only Country Trying to Bypass the Dollar	18
Still a Long Way to Go	19
Conclusion	21
About the Authors	21
Notes	22



## + ABBREVIATIONS

ATM	automated teller machine
BIS	Bank for International Settlements
BRI	Belt and Road Initiative
BRICS	Brazil, Russia, India, China, and South Africa
BSA	bilateral swap agreements
BSN	Blockchain Service Network
CBDC	central bank digital currency
CIPS	(China's) Cross-Border Interbank Payment System
CPMI	Committee on Payments and Market Infrastructure
DLT	Distributed Ledger Technology
EU	European Union
HKMA	Hong Kong Monetary Authority
IMF	International Monetary Fund

KYC	know-your-customer
m-CBDC	multiple central bank digital currencies
P2P	peer-to-peer
PBoC	People's Bank of China
PoS	point-of-sale
QR	Quick Response
RMB	renminbi
SCO	Shanghai Cooperation Organization
SDR	Special Drawing Rights
SHFE	Shanghai Futures Exchange
SINE	Shanghai International Energy Exchange
SPFS	System for Transfer of Financial Messages
SWIFT	Society for Worldwide Interbank Financial Telecommunications
TPSP	third-party service provider
UPI	Unified Payments Interface

## Summary

Central bank digital currencies (CBDC) are digital tokens issued by central banks. In a way, they are the digital version of cash; their value is guaranteed by a central bank. Unlike money held in credit cards and mobile wallets, CBDCs are not a mere representation of physical money stored elsewhere. Instead, they are a complete replacement for currency notes. While several countries are developing their digital currencies, China is well positioned to take the lead with the digital yuan. This paper highlights ways in which China can use its digital yuan to internationalize the renminbi (RMB) and gradually chip away at the hegemony of the dollar.

The first part of the paper focuses on the dollar's dominance in the global financial system and the privileges the United States accrues as a result of the dollar being the world reserve currency. The United States has a tight grip on the world's payment rails, especially in the case of cross-border transactions. For example, the Society for Worldwide Interbank Financial Telecommunications (SWIFT)—the largest cross-border payment clearinghouse in the world—has to comply with and implement unilateral U.S. sanctions. These sanctions seriously hinder trade and damage the economies of the countries affected by them, as was the case with Iran, which lost \$150 billion worth of revenue as a result of U.S. sanctions.<sup>1</sup> Once a country is cut off from SWIFT's network, it becomes extremely difficult for it to trade with the rest of the world. Thus, via the dollar's dominance and its geopolitical muscle, the United States is positioned to maintain a tight grip on the world's financial system.

In an increasingly multipolar world, this outdated, decades-old system of the dollar as the apex currency and the United States' position of power that allows it to pursue its own geopolitical interests has become outdated. The U.S. dollar's hegemony has been challenged by economies like those of the European Union (EU), Russia, and China. Of all the countries, China finds itself in a dominant position to gain from this transition. In order to challenge the dollar's hegemony and internationalize its currency, China will have to move away not just from the dollar but also from the payment rails dominated by the dollar. The best way to simultaneously do both would be to introduce a new payment rail like CBDCs.

This paper analyses the way the launch of China's CBDCs could greatly enhance its currency internationalization prospects. Considering China's growing economy and influence over the world, the paper argues that China's CBDC launch could bring a period of momentous change in the global financial system. In order to challenge the dollar, China will have to build the payments infrastructure required to facilitate the use of its digital yuan. It will also have to incentivize other countries to adopt its digital currency. China's ability to successfully promote its currency using CBDCs will

depend heavily on the country's ability to relax capital controls and maintain the world's trust in its institutions. China's geopolitics will play a key role here. In the last decade, some of China's major geopolitical efforts have set the stage for its CBDC launch.

As China continues to use its foreign policy and technological capabilities to grow its influence in the global financial system, the launch of the digital yuan could be a significant step forward in this direction. This paper examines the reasons for China's past efforts at currency dominance and explores ways in which the country can use its CBDC to further internationalize its digital yuan.

## Introduction

Ideas and technologies imagined and created in China have shaped the world today. The Song dynasty was the first to introduce paper money to the world, and today, China is also at the global forefront in developing digital currencies.<sup>2</sup> While government-issued paper money started its journey in China, for more than seventy years, the U.S. dollar has remained central to the global monetary system. Around the world, the dollar is used as a store of value, a unit of account, and a medium of exchange. One way the United States has been able to maintain its powerful economic and geopolitical status is through the dollar's hegemony in the global financial system. The dollar makes up almost 60 percent of foreign currency reserves.<sup>3</sup> Today, one leg of most of the trade transactions in the world passes through a U.S. financial institution. This often grants the United States some political leverage, as it is able to impose unilateral sanctions against countries for its own political reasons. Two months into his presidency, Joe Biden declared that he sees stiff competition from China in the future.<sup>4</sup> China has steadily grown to become the world's second-largest trading partner after the United States. In 2020, China overtook the United States and became the European Union's (EU's) top trading partner.<sup>5</sup> In 2021, it overtook the United States as India's top trading partner.<sup>6</sup> China's growing economic prowess and stark ideological differences from the United States have positioned the country as the United States' top competitor.

This paper argues that after introducing paper currency to the world, China's currency redux using its Central Bank Digital Currencies (CBDC) could enable the country to diminish U.S. influence over its financial system, which could serve as the turning point for the political and economic dominance of China. The digital yuan provides it with the opportunity to make a comeback and to set the rules of the international financial system. With the U.S. Federal Reserve's own CBDC efforts far behind those of China, it is well within China's capabilities to use its CBDC to actively challenge the dollar's dominance in the world's financial system.<sup>7</sup>

## Why the Current Dollar-Centric Monetary System Does Not Work for China

The U.S. dollar emerged as the dominant economic force in the post-Bretton Woods world economy. Since then, the world's financial system has been centered on the dollar. Today, the United States is the world's second-largest trading partner. In contrast, despite China being the world's largest trading partner, its currency still makes up less than 2 percent of the world's reserve currency.<sup>8</sup> Due to this discrepancy between China's share in trade and its currency's share in the global economy, the country remains beholden to a financial system that undermines its importance. The past few years have seen an accelerating trade war between China and the United States. Because China's cross-border trade depends heavily on the dollar and its payment rails, China's bargaining power in a trade war has been cut down massively.

## The Dollar and Its Role in Geopolitics and Sanctions

The United States has soft power over the dominant payment rails. Cross-border transactions made over payment rails like the Society for Worldwide Interbank Financial Telecommunications (SWIFT) are ultimately settled in dollars or have at least one leg of the transaction that involves a U.S. financial institution. With this advantage over China, the United States can potentially leverage its hold on the world's financial plumbing and use it as a tool for sanctions on Chinese companies, blocking China from the global financial settlement mechanism. The recent instance of the United States threatening to delist Chinese companies from the U.S. stock exchanges is a case in point.<sup>9</sup>

The United States could direct organizations like SWIFT to stop clearing transactions made by the sanctioned country. Though SWIFT describes itself as “a neutral global cooperative,” the organization could face consequences if it resists U.S. pressure to authorize sanctions.<sup>10</sup> This gives the United States the power to deny countries access to its payments and clearing infrastructure, thereby isolating them from world markets. A country sanctioned by the United States gets cut off from the existing dominant cross-border payment rails. Consequently, it is unable to do business with the rest of the world. Once denied access to this infrastructure, an organization or country becomes isolated and financially crippled. For example, in 2013, the United States passed sanctions against Iran that blocked Iran from selling oil abroad.<sup>11</sup> This led to Iran's oil exports being cut in half and a rapid decline in its economy.<sup>12</sup>

The United States regularly uses its sanctions as a tool to promote its foreign policy objectives and economic interests around the world. Currently, the United States has over thirty active financial and trade sanctions programs, which have a significant impact on the economy of the country being targeted. As of January 2021, countries sanctioned by the United States include the Balkans, Belarus, Burundi, Central African Republic, Cuba, Democratic Republic of Congo, Hong Kong, Iran, Iraq, Lebanon, Libya, Mali, Nicaragua, North Korea, Somalia, Sudan, South Sudan, Syria, Ukraine/Russia, Venezuela, Yemen, and Zimbabwe.<sup>13</sup> It is also noteworthy that many of the United States' sanctions are unilateral rather than multilateral and are not backed by other major countries. This means the United States can enforce crippling sanctions on other countries without much support from the rest of the world.

## Digital Yuan: China's Latest Trump Card?

### China Ahead of the CBDC Curve

China has been working on its digital currency since 2014. In 2016, the People's Bank of China (PBoC) successfully built the digital yuan prototype. At the end of 2017, the PBoC started the digital yuan research and development project, which saw participation from large commercial

banks, internet companies, and telecommunications players. Five years later, in May of 2019, China became the first major country to launch a large scale pilot for its CBDC in cities like Shenzhen, Suzhou, Chengdu, and Xiong'an.<sup>14</sup> According to a white paper published by the PBoC in July 2021, the pilot now spans the Yangtze River Delta; the Pearl River Delta; the Beijing-Tianjin-Hebei region; and China's central, western, northeastern, and northwestern regions.<sup>15</sup> As China nears completion of its large-scale pilot program, all other major central banks in countries like the United States, the UK, and India are still at the research stage of their CBDC initiatives.

After just two years of testing, by June 2021, the digital yuan had been applied in over 1.2 million scenarios like for paying utilities, transportation fees, for availing government services, shopping, and more. More than 20.87 million personal wallets and over 3.51 million corporate wallets had been opened, with transaction volumes totally 70.75 million and transaction value approximating RMB34.5 billion.<sup>16</sup> June 2021 also marks the month the digital yuan payments were enabled to be accepted in the entire Beijing subway system network.<sup>17</sup>

In comparison to China, other major central banks' CBDC initiatives are at a very nascent stage. According to a survey of sixty-five major central banks conducted by the Bank for International Settlements (BIS), 86 percent of central banks worldwide are actively engaged in some form of CBDC work; half of them have moved past initial research toward experimenting and running pilots.<sup>18</sup> The Bank of Canada, the Bank of England, the Bank of Japan, the European Central Bank, the Federal Reserve, Sveriges Riksbank, the Swiss National Bank, and the BIS have also engaged in some collaborative research about possible considerations and design plans for CBDCs and published a report on the underlying principles and core structures of CBDCs.<sup>19</sup>

### Design Features of China's Digital Yuan: What We Know So Far

The digital yuan has several interesting payment methods that include barcode payments, tap-and-go transactions, offline payment options, and facial recognition authentication, among others.<sup>20</sup>

The digital yuan is designed in a way that borrows the advantages of both physical cash and electronic payment instruments. Like in the case of cash, payment operators in China do not charge users for the exchange and circulation services of the digital yuan, making it less costly than other electronic payment methods. The digital yuan does not accrue interest and is designed so that it is loosely coupled with bank accounts and carries settlement finality, which means that payments made using the digital yuan are settled upon payment. In case of anonymity, the digital yuan provides different degrees of anonymity depending on the value of the transaction. Small value transactions can be made with wallets without know-your-customer (KYC) standards; however, large value transactions require users to perform KYC.<sup>21</sup> According to Mu Changchun, the director of PBOC's Digital Currency Research Institute, "The anonymity of the central bank's digital currency is limited

under the premise of controllable risks.<sup>22</sup> However, it is possible to make small payments using anonymous wallets linked to cell phone numbers. To conduct digital yuan transactions of large amounts, consumers will have to undergo KYC verification procedures.<sup>23</sup>

The PBoC has also stated that “the e-CNY system collects less transaction information than traditional electronic payment and does not provide information to third parties or other government agencies unless stipulated otherwise in laws and regulations.”<sup>24</sup>

According to a report by the Financial Times in February 2020, the PBoC’s Digital Currency Research Institute has filed around eighty-three patents between 2017–2018 relating to its plans to launch a digital currency.<sup>25</sup> These patents, owned by the PBoC and state-owned companies or government subsidiaries, provide some more insight into the potential design features of the digital yuan.<sup>26</sup> Several patents that could ensure faster interbank transfers and that would allow customers to exchange their bank deposits for digital yuan have also been filed.

While the digital yuan is not based on blockchain technology, the patents do indicate ways in which the PBoC can use blockchain to manage the digital currency. In March 2021, China also gave out wages to builders using its digital yuan in Xiong’an. The Xiong’an government called this China’s first “on-chain” payments used for wages, which means blockchain technology is used to keep track of and appropriately give out builders’ wages. This marks China’s first “blockchain plus digital renminbi” application scenario.<sup>27</sup>

The patents also indicate that China may intend to regulate CBDC supply using an algorithm based on certain triggers, such as loan interest rates and economic triggers.<sup>28</sup> For example, the inventions will make it possible for the PBoC to issue to a financial institution inactive digital currency, which can only be activated once the financial institution meets certain conditions, like having appropriate lending rates.<sup>29</sup> This means China’s CBDC will become the world’s first programmable money. This programmable aspect of China’s CBDC was tested in July 2021 when, as part of the pilot programs in Chengdu, the Chinese government distributed digital yuan with pre-programmed utility for paying subway fees, shared bike fees, or bus fares. This distributed digital yuan can only be spent on the preprogrammed intended purpose and cannot be converted into general-purpose digital yuan.<sup>30</sup>

Unlike China’s other mobile payment apps like Alipay and WeChat Pay, the digital yuan can be used to make transactions without an internet connection, just by tapping two phones together.<sup>31</sup> This could prove to be the digital yuan’s most attractive feature, as it gives it an advantage over other traditional mobile payment methods and helps imitate properties similar to cash. As part of the digital yuan tests in Beijing, automatic teller machines (ATMs) have been added to the city that convert the digital yuan to cash and vice versa.<sup>32</sup>

China's digital yuan could also exhibit properties that make it simpler to use in international transactions and attractive to hold compared with conventional currencies. For instance, depending on the digital yuan's acceptance network, it could allow its citizens to send money overseas by bypassing the current traditional payment infrastructure of correspondent banking. Citizens will not have to rely on costly commercial banks and messaging services like SWIFT for cross-border payments. The digital yuan could facilitate cross-border payment versus payment transactions by a simple exchange of tokens.<sup>33</sup> For cross-border exchange of tokens to take place, other countries will also have to develop technology that enables them to accept such tokens. While this could take some time, China is already working on developing cross-border platforms and agreements that will facilitate its token exchange.<sup>34</sup>

## Advantages of CBDCs in Cross-Border Payments

The aforementioned CBDC initiatives aim to solve gaps and problems that affect cross-border financial transactions. Once such a cross-border CBDC exchange infrastructure is built, the digital yuan has the potential to become an attractive medium of payment in China's growing cross-border trade.

Most of the problems with any international transfer of funds arise due to the large number of intermediaries involved in the process. The most transformative option to improve cross-border payment comes from peer-to-peer (p2p) arrangements made popular by digital currencies.<sup>35</sup>

### Low Transaction Cost

Due to the number of intermediaries such as correspondent banks involved, cross-border transfers require updates to multiple ledgers, as well as several communication hops in the payment message to perform due diligence. This drives up the cost of transfers.<sup>36</sup> According to the World Bank, the global average cost of retail remittances is 6.51 percent of the total amount sent.<sup>37</sup> In sub-Saharan African countries, the average cost is as high as 8.19 percent of the total amount. Banks are the most expensive type of cross-border funds transfer provider with an average cost of 10.73 percent around the world for remittances.<sup>38</sup>

In the cross-border context, liquidity management in foreign currency is done via funding, which is also costly.<sup>39</sup> CBDCs could effectively reduce the number of intermediaries, thereby limiting the need for multiple and consecutive communication jumps. One of the major advantages of CBDCs is also the lower cost of liquidity management as compared with traditional money. Due to these reasons, CBDCs have the potential to reduce the cost of cross-border payments significantly.

## Real-Time Cross-Border Transactions

Nearly all the present real-time payment systems operate only domestically. It is easier to achieve real-time payments domestically as they require banks to settle payments in only one currency. There are also fewer consecutive transfers in communication needed to settle a domestic transaction, making it faster and more transparent. These systems are harder to scale up to the cross-border payments sphere, as they involve multiple players, jurisdictions, regulations, and time zones.<sup>40</sup> The only way to achieve real-time transactions in cross-border transfers is by eliminating intermediaries, thereby reducing the excessive communication hops. This can be done through digital currencies that enable the settlement of transactions through a p2p network between the payer and the payee. Popular digital currencies like Bitcoin and Libra (now Diem) are already capitalizing on the existing shortcomings of the cross-border payment landscape by utilizing Distributed Ledger Technology (DLT).<sup>41</sup> The BIS Committee on Payments and Market Infrastructure (CPMI), in its report titled “Enhancing Cross-Border Payments: Building Blocks of a Global Roadmap,” also identifies the building of new payment infrastructure and arrangement through CBDCs and stable coins as a potential way to improve cross-border transactions.<sup>42</sup>

## Easier-to-Scale Digital Infrastructure

While China has taken several steps toward internationalizing the renminbi (RMB), as outlined earlier, the launch of its CBDC could be a potential tipping point. The new digital yuan offers an opportunity to build a scalable model for global trade and services payments by making it potentially easier and cheaper to move money from anywhere to anywhere else in the world.

Though the digital yuan is a new payment instrument, China would not have to establish a fresh acceptance network. Due to its digital nature, China could easily distribute its digital yuan through preexisting payment platforms like Alipay and WeChat Pay wallets. This increases the scalability of the digital yuan as it can easily ride on already well-established current acceptance infrastructure. Like in the case of credit and debit cards, merchants had to incur significant additional costs like purchasing a point-of-sale (PoS) device to swipe cards and paying recurring service fees either monthly or per transaction. Additionally, establishing card payments involved connecting consumers to banking infrastructure, which required setting up physical banks in remote corners of the world and enabling people’s access to those banks. Setting up digital payments is not as labor and cost intensive.

In certain developing countries, the adoption rates of digital payments have drastically surpassed those of card payments. Two decades ago, China was mostly a cash economy; today, the country has leapfrogged to becoming the largest e-payment market in the world. As of June 2019, China’s

largest mobile payment company, Alipay, in association with local wallet partners, had at least 1.2 billion users worldwide.<sup>43</sup> In 2018, China handled a total of 532.81 billion mobile payment transactions, worth a total of 445.22 trillion yuan.<sup>44</sup> In another example, it took only five years for India's Unified Payments Interface (UPI) to clock 18 billion annual transactions and surpass decades-old payment card players like Amex.<sup>45</sup> According to Amitabh Kant, CEO of Niti Aayog, UPI is expected to surpass the number of annual transactions by payment giants like Visa and Mastercard by 2024.<sup>46</sup>

It is important to note that a major contributing factor to the aforementioned examples that demonstrate easy scalability of digital payments is the presence of state-driven incentives. In its CBDC trials, China has already begun to incentivize its digital yuan by giving users exclusive discounts on certain purchases.<sup>47</sup> More incentives like subsidies and discounts can be expected in the future. The PBoC is also expected to partner with China's dominant mobile payment players like WeChat Pay.<sup>48</sup>

Attractive discounts can greatly aid early adoption of China's CBDC among its population. Similarly, in case of cross-border payments, China will have to compete with the existing correspondent banking model as well as the likes of PayPal, Diem, and other dollar-dominated payment rails. To ensure widespread use of the digital yuan internationally, China can use a range of tactics like trade incentives, low interest rates on digital yuan debts, and lower costs than its competitors, especially in regions where it has major influence (see box 1).

#### BOX 1

### **Digital Yuan for More State Control Over Domestic Banking Systems**

China has one of the most advanced payments landscape in the world. This development can be credited to two major private payment players in China—Tencent and Ant Group. In 2019, Ant Group's parent company Alibaba held 55.1 percent of the mobile payments market and Tencent held another 38.9 percent, making these two companies duopolies with control of over a trillion dollars of mobile payments.<sup>49</sup> This means private players control a majority of the payments market in China, and given that mobile payments account for more than half of the noncash retail payments in China, bank deposits are strained and money is taken out of the traditional banking system.<sup>50</sup> This means that two private companies control vast amounts of financial data on billions of Chinese consumers. This helps the two private companies to build better financial products and also to provide extremely low borrowing rates, which makes other financial players noncompetitive. This scenario also leads to the disintermediation

of the Chinese state-owned banks from the banking system, raising concerns for the Chinese government. The digital yuan is expected to break the alleged duopoly of Tencent and Ant Financial and give the Chinese government ownership and control of big data. Whether China decides to use WePay and AliPay as key channels for distribution of the digital yuan remains to be seen.

According to the PBoC, one of China's key motivations behind developing the digital yuan is to protect its financial system from instability. In case either Tencent or Ant Financial were to experience financial or technical setbacks, the impact on China's financial system could be highly detrimental. China's CBDC infrastructure could provide some redundancy to its payments landscape.

## Digital Yuan: A Tool for Internationalization

In order to challenge the dollar's hegemony and internationalize its currency, China will have to move away not just from the dollar but also from the payment rails dominated by the dollar. The best way to simultaneously do both would be through introducing greenfield payment rails like CBDC. But to do so, China will have to work out agreements and mechanisms of exchanging its digital yuan with the rest of the world. As CBDCs are a relatively new technology with no international standards and design, China could well become the standard setter. The PBoC in its white paper indicated that the central bank has been working on setting standards for digital currencies by engaging with regulators in various jurisdictions, multinational financial institutions, and universities. The bank has also participated in building an international standard system under the framework of international organizations for digital fiat currencies.<sup>51</sup>

The following paragraphs outline China's initiatives that indicate that China plans to use the digital yuan to further its currency internationalization agenda.

### China's Cross-Border CBDC Initiatives

#### *Multiple CBDC Bridge*

Recently, the Digital Currency Research Institute of the PBoC and the Central Bank of the United Arab Emirates joined the Multiple CBDC (m-CBDC) Bridge, a cross-border payments project of the Hong Kong Monetary Authority (HKMA) and Bank of Thailand, run in partnership with the BIS Innovation Hub.<sup>52</sup> This project aims to “develop a proof-of-concept prototype to facilitate real-time

cross-border foreign exchange payments on distributed ledger technology.”<sup>53</sup> It is meant to foster a conducive environment for central banks to study the capabilities of DLT to alleviate certain pain points in the current cross-border fund transfers.<sup>54</sup>

Of all the central banks that are part of the project, PBoC’s CBDC initiatives are the most advanced. In December 2020, Eddie Yue, the chief executive at HKMA, revealed plans for pilot testing cross-border payments using the digital yuan.<sup>55</sup>

According to a survey conducted by BIS of fifty countries on m-CBDC arrangements, central banks seem to be actively looking into the cross-border usage of CBDCs. While the survey mentions that a majority of central banks have not yet decided if nonresidents will have access to their CBDCs, twenty percent of them could consider non-resident access at a later stage. A little more than a quarter of respondents reported that they would allow access.<sup>56</sup>

## BOX 2

### **Blockchain**

Blockchain is a type of Distributed Ledger Technology. DLT is a rapidly evolving approach to recording and storing data across multiple participants in multiple locations. Unlike traditional databases, DLT is a decentralized database in which transactions and data are replicated, stored, and synchronized over a distributed network consisting of several nodes. Due to the absence of a central authority to ascertain the veracity of data and to commit new transactions, DLTs rely on consensus algorithms that ensure the validity of such data. Once a consensus is reached among the participating nodes, a new transaction is added to the ledger. Reaching a consensus is appropriately difficult, and this establishes overall reliability of the system. DLTs have some key characteristics: they can be public or private, permissioned or permissionless. A public DLT can be accessed by anyone, whereas a private DLT is access restricted. In a permissionless DLT, any participant can make changes to the ledger provided they are able to achieve consensus, while in a permissioned DLT, only specific entities can authorize or commit updates to the ledger.

A blockchain, often confused and used interchangeably with DLT, is a type of DLT. In a blockchain, each transaction (block) is linked together in a list (chain) with a cryptographic hash. Blockchains are popularly used for recording transactions made with cryptocurrencies, such as Bitcoin, but have a variety of other applications. The most well-known blockchain, the Bitcoin blockchain, is a distributed, decentralized, public, and permissionless ledger.

### *Blockchain Service Network*

China's government-backed national initiative Blockchain Service Network (BSN) plans to build an ambitious digital currency network in the next five years (see box 2). BSN plans to work with several international banks and technological companies to build a platform to standardize the cross-border exchange of stable coins and CBDC termed as universal digital payments networks. The platform is expected to be easy to use and cost friendly. The beta version of this payment solution is expected to launch in the second half of 2021.<sup>57</sup> Some of the main partners of BSN include China Mobile (China's largest national telecom, with over 900 million subscribers) and China UnionPay (the world's top payment and settlement provider, with 8 billion issued credit cards).<sup>58</sup> Access to the wide acceptance network of China Mobile and UnionPay can play a key role in popularizing and standard setting of CBDCs.

The benefits of CBDCs seen through faster, low-cost, and real-time cross-border transactions can make BSN's platform an extremely attractive payment option. As consumers around the world get used to extremely fast and efficient domestic transactions, it seems inevitable that central banks will move toward CBDCs.<sup>59</sup>

### *Finance Gateway Information Services Co.*

Finance Gateway Information Services Co. is a joint venture between SWIFT and the PBoC's Digital Currency Research Institute. While the exact motive of the company remains unclear, public records only state plans for information system aggregation, data processing, and technology consulting. Shareholders of Finance Gateway Information Services Co. include Cross-Border Interbank Payment System (CIPS) and the Payment & Clearing Association of China, both supervised by the PBoC.<sup>60</sup> The PBoC's partnership with the world's largest payment clearing company in the CBDC arena signals China's intent to popularize its digital yuan for cross-border use.

While the aforementioned efforts could give China a major advantage in standard setting, it is possible that CBDC designs could differ among countries. While China cannot influence the design of other CBDCs, it could influence the way they are exchanged and traded. In his speech at a BIS seminar, the director general of the PBoC's digital currency institute laid out a proposal for global rules for CBDC.<sup>61</sup> He specifically talked about interoperability between CBDCs, information synchronization and funds flow to facilitate regulators to monitor the transactions for compliance, and a DLT-based scalable foreign exchange platform for CBDCs.<sup>62</sup>

### **Opportunities for Cross-Border Use of the Digital Yuan**

While building the alternate payments infrastructure is step one of moving away from the dollar, step two would be to incentivize its payment infrastructure to the rest of the world and find takers of the digital yuan. China is uniquely positioned to popularize the use of its digital currency due to its

geopolitical influence over the world, its trade prowess, and wide payments network. Major countries like France, Japan, and the United States have recognized China's position of power and termed the Chinese digital yuan a potential geopolitical risk.<sup>63</sup> This section identifies the ways in which China can popularize its digital yuan and build a massive payments infrastructure.

#### *Using the Digital Yuan for Transactions Along the Belt and Road Initiative*

China has many avenues to expand its influence over the global financial market through its CBDC. First among them is the Belt and Road Initiative (BRI), a China-led economic development initiative focused on infrastructure investment that spans Asia, Europe, and Africa. This project is expected to pump trillions of dollars of investments into infrastructure-related projects in over seventy countries.<sup>64</sup> The digital yuan, due to its purported benefits like faster and cheaper transactions, can give China the opportunity to reduce the cost and increase the ease of conducting cross-border trade along the BRI. Using its digital currency to settle cross-border transactions over the current payment clearing systems would enable China to bypass the existing U.S.-centric financial system while conducting business. This would immunize China's business along the BRI against U.S. sanctions—significantly benefiting China's geopolitical position, as well as its trade.

China is already on track to increase yuan circulation via BRI. In 2019, trade with BRI member nations surpassed 9.27 trillion yuan (about \$1.34 trillion).<sup>65</sup> China is the largest trade partner to around twenty-five countries along the BRI<sup>66</sup> and has struck currency swap agreements with more than twenty BRI nations.<sup>67</sup> As part of the initiative, China is promoting the use of the yuan for cross-border trade. To help finance the BRI, the Bank of China and China Construction Bank have also issued offshore yuan-denominated bonds and foreign currency bonds.<sup>68</sup>

#### *Using Digital Yuan in Debt Issuance and Recovery*

Between 2013 and 2018, China appropriated aid worth \$41.8 billion, out of which 47 percent were grants, 48 percent concessional loans, and 4 percent interest-free loans.<sup>69</sup> China's extensive aid program can be seen as a way of building soft power around the world. Through the BRI, China is creating a scenario in which several weak economies are growing increasingly dependent on it for loans. China is also accused of creating a debt trap for countries along the BRI, with Djibouti, Kyrgyzstan, Laos, the Maldives, Mongolia, Montenegro, Pakistan, and Tajikistan falling fast into the trap.<sup>70</sup> These countries will all face rising debt-to-gross-domestic-product ratios beyond 50 percent, with at least 40 percent of external debt owed to China once BRI lending is complete. This could significantly increase China's influence over such debt-ridden countries. China could use that influence to persuade countries into adopting its digital yuan for bilateral transactions.<sup>71</sup>

Africa's biggest bilateral creditor is China. According to estimates, China's government, banks, and state-owned corporations hold 17–24 percent of Africa's external debt.<sup>72</sup> African countries like Zambia and Djibouti owe most of their debt to China.

China can assert its influence over countries with mounting Chinese debt by pushing them to accumulate the Chinese digital yuan reserves to pay back the loans. China can even provide countries with concessions on loans to promote its digital yuan. If the cost of switching to China's digital yuan is low, countries will see no benefit in continuing their trade transactions with China in dollars. Using digital yuan as the currency of invoice to disburse loans can make these transactions more transparent and manageable. This could also allow for more state control over funds, an attractive scenario for China. As many contracts around construction of African airports and railroads are implemented by Chinese companies, the contractor payments could be made using the digital yuan, without routing the money through foreign governments.

For countries to readily adopt the digital yuan, China will have to first build the infrastructure and second, incentivize countries to use the digital yuan for trade. Both these scenarios are highly plausible considering China's growing soft power in countries indebted to it and its motivations to build alternate infrastructure for trade not dominated by the dollar.

#### *Leveraging Existing Chinese Payment Infrastructure to Promote Digital Yuan*

Millions of stores worldwide now accept WeChat Pay, Alipay, and UnionPay payments. Furthermore, WeChat Pay is available in forty-nine countries, and Alipay is also accepted in forty-two countries.<sup>73</sup> Together, Alipay and WeChat Pay have an active user base of around 1.9 billion.<sup>74</sup> China could easily distribute its digital yuan through preexisting payment platforms like Alipay and WeChat Pay wallets. This would not require building fresh acceptance infrastructure; it can easily ride on the current acceptance infrastructure.

China has required Alipay to switch its Quick Response (QR) code payment clearing system to UnionPay (China's domestic card scheme). In early 2020, PayPal Holdings Inc. also announced its partnership with UnionPay.<sup>75</sup> This partnership allows UnionPay cardholders to access PayPal's extensive network and could lead to UnionPay cards being accepted in all physical retail locations where PayPal is currently accepted. UnionPay cards are already accepted by over 27 million merchants in 173 countries.<sup>76</sup> China can use this established network to set up PoS across countries where UnionPay exists. This means China already has access to a wide network setup that will facilitate its digital yuan use around the world. Although at present China's digital yuan is only available for domestic use, China can easily expand to international use via UnionPay.

Additionally, if China manages to work out currency exchange regulations with certain countries, it can also distribute its digital yuan to people overseas. This would allow non-Chinese nationals to

hold the digital yuan as well as use its network around the world. While this may sound far-fetched, China has massive influence over countries in Africa and Asia, where it can easily negotiate the regulations required to distribute its digital yuan to foreign nationals.

### *Remittances in Africa*

Considering China's presence and influence in Africa, China can make its digital yuan available to the people of sub-Saharan Africa as an alternative and much cheaper way to send and receive remittances. In today's payment landscape, remittances are a huge payment pain point. CBDCs are payment instruments that solve the problems of high transaction costs, settlement risks, and delayed payments, and promise a future where anyone can send money overseas with the touch of a button. According to the World Bank, the global average cost of sending remittances is 6.51 percent of the transaction amount.<sup>77</sup> The sub-Saharan African region recorded an average remittance cost of 8.19 percent, the highest anywhere in the world.<sup>78</sup>

China already has an extensive payments network established in the East Africa region.<sup>79</sup> In Africa, UnionPay is accepted in over fifty countries and issued locally in twelve of them. Most recently, UnionPay International announced its partnership with Interswitch East Africa (Kenya), making it a third-party service provider (TPSP) for UnionPay.<sup>80</sup> This means UnionPay cards will now be accepted across PoS, ATMs, and QR and for online payments across the East Africa region.

This shows that China already has the network established to promote the use of its digital yuan in African countries. China can easily make this infrastructure available for receiving remittances. Such a move could help promote China's digital yuan in African countries.

## China's Past Efforts to Internationalize Its Currency

The financial crisis in 2008 represented the failure of a Western-dominated financial world order. It pushed China to attempt to retain its autonomy over capital movements and key financial variables. As a result of the crisis, China began to set up the building blocks that could enable it to gradually reduce its dependency on the U.S. dollar. Since the late 2000s, China has undertaken a string of measures to internationalize its currency to craft a world order with RMB at its center. These actions should not be viewed in isolation but rather as part of a larger and more coordinated attempt to dethrone the dollar as the global financial system's anchor. It is worth noting that the RMB internationalization is largely a Chinese government-driven process, as opposed to the cases of other internationalized currencies like the U.S. dollar and Japanese yen, where the market drove internationalization. Some of China's key interventions to internationalize its currency are listed in the following paragraphs.

## Building Offshore RMB Clearing Banks

China's most successful internationalization initiative is CIPS. CIPS was built to increase RMB convertibility across the globe. It has a presence in all major countries, including the United States, Singapore, Britain, France, Germany, South Korea, Russia, and Japan. Currently, thirty-one institutions directly participate in CIPS, and over 847 institutions participate indirectly.<sup>81</sup> In addition to trade payments, CIPS supports instant settlement for cross-border financial transactions. China launched the CIPS clearing and settlement services system in 2015, and within four years, CIPS reported processed transactions worth RMB 135.7 billion (\$19.4 billion) per day, with ninety-six countries and regions participating.<sup>82</sup> It is noteworthy that it took CIPS just four years to establish its wide network. These offshore networks play a significant role in facilitating the use of RMB globally. Apart from RMB internationalization, CIPS has also helped develop China's financial sector and has been instrumental in the success of the BRI.<sup>83</sup>

London leads the forex business for the RMB. The UK handles 33.79 percent of the world's RMB offshore transactions.<sup>84</sup> Africa and the Middle East saw a 20.98 percent increase in the number of financial institutions using RMB for payments. The figure rose from 143 financial institutions in July 2017 to 173 in July 2019.<sup>85</sup>

## RMB-Dominated Oil Futures

The world's largest importer of crude oil is China.<sup>86</sup> In 2018, China established oil futures, tradable in yuan, on the Shanghai International Energy Exchange (SINE), a branch of the Shanghai Futures Exchange (SHFE).<sup>87</sup> This is an essential part of China's currency internationalization strategy. By establishing yuan-dominated oil futures, China gives the global market participants a reason to use the yuan. These oil futures also aid China in boosting its pricing power when it comes to crude oil.<sup>88</sup> This move counters the "petrodollar" practice in which oil is valued and invoiced in U.S. dollars around the world; this practice was also instrumental in paving the way for the dollar to become a reserve currency. Considering that China is the largest importer of crude oil in the world, the "petroyuan" has the potential for wide adoption.

China's oil futures market has done exceptionally well. The SINE, which is used to measure the total number of outstanding contracts, increased by four times to 118,249 between 2019 and 2020.<sup>89</sup> There has also been a steady 20 percent rise in trading and positions of the contracts almost every year.<sup>90</sup> The SHFE trades fourteen commodities futures, including aluminum, nickel, and electrolytic copper and zinc.<sup>91</sup>

## Bilateral Currency Swap Deals

The PBoC has signed bilateral swap agreements (BSAs) with forty-one nations between January 2009 and 2020.<sup>92</sup> A BSA is a swap line established between two central banks. It allows one party of the agreement to exchange a certain amount of its local currency for foreign currency funds from the counterparty at a preset or market exchange rate.<sup>93</sup> Such currency swap deals make it easier for companies in China and its partnering countries to conduct and settle cross-border trade and invest in RMB and their own local currencies. As convertibility and ease of access of RMB increases with BSAs, countries are more likely to trade in RMB. Today, the yuan bloc accounts for 30 percent of global gross domestic product, second only to the U.S. dollar (at 40 percent).<sup>94</sup> A currency bloc represents a group of countries that peg their own national currencies to a single currency.

## Special Drawing Rights

In 2016, the RMB was added to the basket of currencies that compose the International Monetary Fund's Special Drawing Rights (SDR). The SDR is an international reserve asset created by the International Monetary Fund (IMF) in 1969 to supplement its member countries' official reserves.<sup>95</sup> The SDR basket is made up of the U.S. dollar, euro, yen, British pound, and RMB. Every currency in the SDR basket must meet high transparency standards. The addition of the RMB helped increase its credibility among official holders of foreign currency reserves, which in turn increased the use of RMB in international trade.

## Belt and Road Initiative

China's Belt and Road Initiative, which promotes regional development through a vast network of infrastructure projects and economic zones, could, in part, lead to the expansion of the international use of the RMB. According to one analysis, China announced over \$81 billion worth of investments in the second quarter of 2018 alone.<sup>96</sup> If countries along the BRI purchase equipment and services in RMB, they reduce their foreign exchange risk. The BRI will also allow Chinese companies to use their RMB balance sheets to fund projects along the Belt and Road. This will increase RMB liquidity in those countries, which will further enable RMB business.

According to Standard Chartered bank, the yuan was used for trade settlement in 13.9 percent of cross-border transactions between China and Belt and Road countries in 2016.<sup>97</sup> China is promoting increased yuan use for cross-border trade under the initiative, the bank says. The Bank of China and China Construction Bank have also issued offshore yuan-denominated bonds and foreign currency bonds to help finance the BRI.<sup>98</sup>

## China Is Not the Only Country Trying to Bypass the Dollar

As a result of geopolitical and economic factors, the competitive environment of reserve currencies is intensifying rapidly. As emerging economies scale new heights, the movement to displace the dollar from the dominant position in the global financial order is also growing. Due to the United States' unsustainable spending habits, the U.S. budget deficit was a record-shattering \$3.1 trillion by the end of September 2020.<sup>99</sup> By June 2021, the deficit for the first eight months of the fiscal year 2021 stood at \$2.1 trillion. In July 2021, the U.S. Congressional Budget Office estimated a budget deficit of over \$3 trillion by the end of the 2021 fiscal year.<sup>100</sup> As a result, as of January 2021, the dollar index hit 91, its lowest level since April 2018.<sup>101</sup> The dollar index is a measure of the value of the U.S. dollar relative to the value of a weighted basket of currencies, consisting of the United States' largest trade partners. This is an indicator of the relative strength of the dollar around the world.

According to the IMF's official foreign exchange reserve survey, the dollar's share of reserves held by central banks hit a twenty-five-year low of 59 percent during the fourth quarter of 2020.<sup>102</sup> It is noteworthy that in 1999, just over twenty years ago, the dollar's share was 71 percent. This is a clear signal that the U.S. hegemony over reserves currencies is decreasing.<sup>103</sup> We can attribute this change in part to the rest of the world's effort to internationalize domestic currency to reduce the dollar's influence over their payment systems and benefit from trade gains that come with transacting in local currencies.

The best way to reduce the United States' influence over other countries' economies is to reduce their dependency on the dollar for conducting trade. This section explores the trends that explain why the days of the dollar could be numbered.

### Bilateral Trade in Dollars Between China and Russia Hit an All-Time Low

The United States' use of dollar hegemony to further its national security interests and flex its economic muscle has led to countries actively looking to bypass the dollar system to conduct trade. Major countries like Russia and China have initiated bilateral swap agreements to increase trade in their own national currencies. In 2015, the use of the dollar in bilateral trade between China and Russia stood at approximately 90 percent.<sup>104</sup> In the first quarter of 2020, the figure dropped to an all-time low of 46 percent, while 30 percent of the trade was conducted in euros and 25 percent in their own national currencies.<sup>105</sup> Initially, China replaced the dollar in trade with Russia to sidestep U.S. sanctions on Russia. The trade war between China and the United States further exacerbated China's apprehensions toward the dollar and helped solidify its trade and economic partnership with Russia.

Recently, the Shanghai Cooperation Organization (SCO)—with member countries that include China, Russia, and India—decided to conduct bilateral trade, investments, and issue bonds in their own national and local currencies instead of using the dollar.<sup>106</sup> A prominent development bank, the New Development Bank (formerly the BRICS Development Bank)—with member countries of Brazil, Russia, India, China, and South Africa—has also decided to move away from the dollar and issue 50 percent of its loans in national and local currencies.<sup>107</sup>

### Rise in Alternatives to SWIFT

Several efforts are also under way to develop alternatives to the supremacy of the SWIFT network, which is essentially the plumbing for cross-border financial flows. The United States repeatedly threatens countries with sanctions that would disconnect them from the SWIFT network.

In response to the U.S. government's threats to disconnect Russia from the SWIFT system, Russia has developed its own financial messaging system, called the System for Transfer of Financial Messages (SPFS).<sup>108</sup> Russia's deputy foreign minister, Alexander Pankin, stated that Russia echoes China's concerns around SWIFT.<sup>109</sup> He indicated that worldwide developments of alternatives to SWIFT are a response to the current geopolitics. He also suggested that there is a need to modernize payment methods, which can be achieved by building more advanced payment clearing systems.<sup>110</sup>

Recently, Russia has also launched efforts to integrate SPFS and Mir (Russia's national payment system) with China's CIPS and UnionPay counterparts. Russia has also launched efforts to integrate SPFS across the Eurasian Economic Zone.<sup>111</sup> China has built CIPS in twenty-five major countries, including the United States, Singapore, Britain, France, Germany, South Korea, Russia, and Japan.<sup>112</sup>

It is not merely U.S. adversaries such as Russia and China that have launched competing payment messaging services as the underlying infrastructure for cross-border payment flows. U.S. allies in Europe are also developing a parallel system to SWIFT as a means of enhancing the region's financial autonomy. European nations use their homegrown alternative Instrument in Support of Trade Exchanges (INSTEX) to conduct trade with Iran, a nation cut off from SWIFT due to U.S. sanctions.<sup>113</sup> There is no need for countries to build new payment rails for cross-border trade when such payment rails already exist. However, as the United States holds a tight grip over cross-border payment rails via SWIFT, countries are forced to look for alternatives.

### Still a Long Way to Go

The digital yuan is not, by any means, a magic bullet for China's internationalization aspirations. If used properly, the digital yuan could boost China's internationalization prospects. It could also help

challenge the dollar's hegemony in international finance. However, several roadblocks could hinder the success of the digital yuan as a tool to challenge the dollar's hegemony.

### Capital Account Controls

The internationalization of the dollar and the euro was mostly market driven. However, China's currency internationalization is a wholly government-driven process. The internationalization of the dollar and the euro was aided by the countries' open and liberalized economies, an important prerequisite for reserve currencies. Comparatively, the Chinese financial system is far more restrictive, perhaps more restrictive than that of any other country that has aspired to internationalize its currency.

China still maintains tight capital controls over its economy. While these controls are maintained to shield the RMB from volatility, they restrict the flow of the RMB across borders. This makes the currency less attractive to investors and financial markets.<sup>114</sup> However, China is relaxing some of its capital controls to make its economy more favorable for foreign reforms. As a result of this opening of its economy, China saw foreign holdings of RMB assets increased to \$1.16 trillion in September 2020 from \$669 billion in December 2018.<sup>115</sup>

### Trust

It is also important for the world to trust Chinese institutions. Takers of the digital yuan will require assurances that are checks on the powers of the executive, which usually comes from political competition. Thus, China's efforts to internationalize its currency might also entail a shift in its political model. At the least, this process could create several political prerequisites for China.<sup>116</sup> The coronavirus pandemic and the escalating trade war between the United States and China have created an unfavorable opinion of China around the world. According to a survey conducted by Pew Research across fourteen major nations, a median of 78 percent say they do not have much confidence in Chinese President Xi Jinping to do the right thing regarding world affairs.<sup>117</sup> The survey also indicated that the world's perception of China as a leading economic power was largely favorable. A majority of the countries believe that China is the world's leading economic power and not the United States.<sup>118</sup>

### Competition From Other CBDCs

The digital yuan's success depends heavily on the ability and the willingness of the rest of the world to embrace digital currencies as a payment instrument. China's ambitions to build yuan-dominated digital payment highways could be hindered if it were to face competition from other digital curren-

cies. The U.S. Fed Chair Jerome Powell has deemed the digital dollar project as a top priority. He has also indicated that the United States plans to play a role in developing global CBDC standards.<sup>119</sup> In order to prevent China from building alternate payment infrastructure, the United States will have to become a credible competitor in the CBDC space. Other Western powers like the EU and Canada are also looking into CBDCs. According to Christine Lagarde, the EU could roll out its version of a CBDC—the digital euro—in the next four years, by 2025.<sup>120</sup>

## Conclusion

A multiyear-low dollar index, domestic political turmoil, increase in racial tensions, protests, riots, haphazard foreign policies, implementations of excessive sanctions, and the lack of U.S. leadership in combating the current pandemic have all caused a dent in the U.S. reputation.<sup>121</sup> While these developments in no way signal the end of the United States' position as a global superpower, they could give competing nations an opportunity to capitalize on U.S. setbacks. At this juncture in world politics, it is especially important to examine the ways in which China—the Eastern center of power—plans to assert its dominance and challenge the United States' power.

Over the last two decades, China has managed to become the world's largest trading partner. China has also carefully, through coordinated efforts of disbursing aid, investments in infrastructure, and technological advances, built its soft power around the world. However, with only 2 percent share in the world's foreign exchange reserves, China has only managed to make a dent in the U.S.-dominated global financial system. China's digital yuan project could turn that dent into a crater if it manages to successfully create an alternative to the present dollar-dominated payment rails. The digital yuan could prove to be China's most effective and noteworthy attack on U.S. hegemony. China does not plan to do this alone. By setting up cross-border CBDC arrangements with unlikely allies like Russia, these new payment highways could liberate the world from living under the constant threat of U.S. sanctions. For the first time since the Bretton Woods system, which left the reins of the world's financial system with the United States, it could become possible for countries to find their way around U.S. sanctions. This is a definite threat to the United States' influence on the rest of the world. With the U.S. Federal Reserve far behind in its CBDC initiatives, it is unlikely that China's digital yuan will face any credible competition in the CBDC sphere soon. China's ability to conduct large-scale pilots of a well-researched and carefully designed CBDC, with no match from the rest of the world, is a testament to China's growing capabilities and wide ambitions.

## About the Authors

**Rajesh Bansal** was most recently a senior adviser at Carnegie India. He led the center's technology and society program. His research focuses on financial technologies, particularly electronic payment systems, electronic cash transfers, and digital financial services to enable inclusive development. He is currently the chief executive officer of the Reserve Bank Innovation Hub.

**Somya Singh** was a research assistant at Carnegie India. Her research focuses on digital payments, central bank digital currencies, and technology policy. She currently serves as a senior associate at the Reserve Bank Innovation Hub.

## Notes

- 1 Arpan Rai, “US Sanctions Cost Iran’s Economy \$150 Billion, Rouhani Says,” *Hindustan Times*, September 26, 2020, <https://www.hindustantimes.com/world-news/us-sanctions-cost-iran-s-economy-150-billion-rouhani-says/story-qvmNnexmA4h5n1MPR23ACK.html>.
- 2 “The Song Dynasty in China | Asia for Educators,” accessed July 13, 2021, <http://afe.easia.columbia.edu/songdynasty-module/econ-rev-money.html>.
- 3 International Monetary Fund, “Currency Composition of Official Foreign Exchange (CoFR),” *International Monetary Fund*, accessed January 20, 2021, <https://data.imf.org/?sk=E6A5F467-C14B-4AA8-9F6D-5A09EC4E62A4>.
- 4 Jenny Leonard and Justin Sink, “Biden Says China Won’t Be Most Powerful Country on His Watch,” *Bloomberg Quint*, March 26, 2021, <https://www.bloombergquint.com/global-economics/biden-says-china-won-t-be-most-powerful-country-on-his-watch>.
- 5 “China Overtakes US as EU’s Biggest Trading Partner,” *BBC News*, February 17, 2021, Business, <https://www.bbc.com/news/business-56093378>.
- 6 “China Regains Slot as India’s Top Trade Partner Despite Tensions,” *BBC News*, February 23, 2021, Business, <https://www.bbc.com/news/business-56164154>.
- 7 Jeff Cox, “The Fed This Summer Will Take Another Step in Developing a Digital Currency,” *CNBC*, May 20, 2021, <https://www.cnbc.com/2021/05/20/the-fed-this-summer-will-take-another-step-ahead-in-developing-a-digital-currency.html>.
- 8 International Monetary Fund, “Currency Composition of Official Foreign Exchange (CoFR).”
- 9 Max Zimmerman and Gregor Stuart Hunter, “NYSE to Delist Chinese Telco Giants on U.S. Executive Order,” *Bloomberg.com*, January 2021, <https://www.bloomberg.com/news/articles/2021-01-01/nyse-to-delist-chinese-telco-giants-on-u-s-executive-order>.
- 10 Overview, “SWIFT Community,” SWIFT, accessed January 20, 2021, <https://www.swift.com/about-us/community>.
- 11 “Nuclear Iran Prevention Act of 2013,” H.R. 850, 113th Cong. (2013), <https://www.congress.gov/bills/113/congress-house/850>.
- 12 “Six Charts That Show How Hard US Sanctions Have Hit Iran,” *BBC News*, December 9, 2019, Middle East, <https://www.bbc.com/news/world-middle-east-48119109>.
- 13 U.S. Department of the Treasury, “Sanctions Programs and Country Information,” U.S. Department of the Treasury, accessed January 20, 2021, <https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information>.
- 14 Reuters Staff, “China to Launch Digital Currency Pilot Program in Some Cities: MOFCOM,” Reuters (Shanghai), August 14, 2020, <https://www.reuters.com/article/us-china-mofcom-yuan-digital-idUSKCN25A0G4>.
- 15 Working Group on E-CNY Research and Development of the People’s Bank of China, “Progress of Research & Development of E-CNY in China” (People’s Bank of China, July 2021), <http://pbc.gov.cn/en/3688110/3688172/4157443/4293696/2021071614584691871.pdf>
- 16 Working Group on E-CNY Research and Development of the People’s Bank of China.

- 17 Jamie Crawley, “China’s CBDC Trials Reach Beijing Subway—CoinDesk,” CoinDesk, June 30, 2021, <https://www.coindesk.com/chinas-cbdc-trials-reach-beijing-subway>.
- 18 Codruta Boar and Andreas Wehrli, “Ready, Steady, Go?: Results of the Third BIS Survey on Central Bank Digital Currency,” *Monetary and Economic Department* (Bank for International Settlements, 2021), vol. 114, <https://www.bis.org/publ/bppdf/bispap114.pdf>.
- 19 Bank of International Settlements, “Central Bank Digital Currencies: Foundational Principles and Core Features,” October 9, 2020, <https://www.bis.org/publ/othp33.htm>.
- 20 Chad Bray and Alison Tudor-Ackroyd, “PBOC’s Digital Currency Used for Transactions Worth 1.1 Billion Yuan.”
- 21 Working Group on E-CNY Research and Development of the People’s Bank of China, “Progress of Research & Development of E-CNY in China.”
- 22 Sun Iulu, “Is the Digital Renminbi ‘Violating User Policy’ a Misunderstanding? What Is the Design of ‘Controllable Anonymity’? Look at the Latest Response from the Central Bank Mu Changchun\_Securities Times,” News, *STCN*, March 21, 2021, [https://news.stcn.com/sd/202103/t20210321\\_2933464.html](https://news.stcn.com/sd/202103/t20210321_2933464.html).
- 23 Sun Iulu.
- 24 Working Group on E-CNY Research and Development of the People’s Bank of China, “Progress of Research & Development of E-CNY in China.”
- 25 Hannah Murphy and Yuang Yang, “Patents Reveal Extent of China’s Digital Currency Plans,” *Financial Times*, February 12, 2020, <https://www.ft.com/content/f10e94cc-4d74-11ea-95a0-43d18ec715f5>.
- 26 Hannah Murphy and Yuan Yang; Chamber of Digital Commerce, “People’s Bank of China Patent Repository: A Roadmap to the Digital Yuan,” *Chamber of Digital Commerce*, February 2020, <https://digitalchamber.org/pboc-patent-repository/>.
- 27 “The Nation’s First Digital Renminbi ‘on-Chain’ Payment Helps Xiong’an Builders Pay Wages-China Xiong’an Official Website,” *China Xiong’an Official Website* (blog), accessed July 5, 2021, [http://www.xiongan.gov.cn/2021-06/12/c\\_1211197959.htm](http://www.xiongan.gov.cn/2021-06/12/c_1211197959.htm).
- 28 Sarah Allen et al., “Design Choices for Central Bank Digital Currency: Policy and Technical Considerations,” NBER Working Paper No. 27634, National Bureau of Economic Research, August 2020.
- 29 Chamber of Digital Commerce, “People’s Bank of China Patent Repository: A Roadmap to the Digital Yuan,” *Chamber of Digital Commerce*, February 2020, <https://digitalchamber.org/pboc-patent-repository/>.
- 30 Wolfie Zhao, “China’s New Digital Yuan Test Shows It Can Be Programmed to Confine Utility,” *The Block*, July 2, 2021, <http://www.theblockcrypto.com/post/110377/china-digital-yuan-test-programmable-chengdu>.
- 31 Chen Jia, “‘Offline Payment Services’ Added to Digital Currency Trials,” *China Daily*, December 16, 2020, <https://www.chinadaily.com.cn/a/202012/16/WS5fd94b02a31024ad0ba9c08d.html>.
- 32 Wolfie Zhao, “Latest Beijing Test Features ATMs That Convert Digital Yuan to Cash,” *The Block*, February 8, 2021, <http://www.theblockcrypto.com/post/95266/beijing-digital-yuan-cash-atm>.
- 33 Raphael Auer, Philipp Haene, and Henry Holden, “Multi-CBDC Arrangements and the Future of Cross-Border Payments,” Bank of International Settlements, Paper No. 115, March 19, 2021.
- 34 BIS Innovation Hub, “Central Banks of China and United Arab Emirates Join Digital Currency Project for Cross-Border Payments,” press release, February 23, 2021, <https://www.bis.org/press/p210223.htm>.

- 35 Financial Stability Board, “Enhancing Cross-Border Payments—Stage 1 Report to the G20” (Basel, Switzerland: Financial Stability Board, April 9, 2020), <https://www.fsb.org/2020/04/enhancing-cross-border-payments-stage-1-report-to-the-g20/>.
- 36 Morten Linnemann Bech, Umar Faruqui, and Takeshi Shirakami, “Payments Without Borders,” *BIS Quarterly Review*, March 2020, [https://www.bis.org/publ/qtrpdf/r\\_qt2003h.htm](https://www.bis.org/publ/qtrpdf/r_qt2003h.htm).
- 37 The World Bank Group, “Remittance Prices Worldwide Quarterly,” *Remittance Prices Worldwide*, no. 36, December 2020.
- 38 The World Bank Group, “Remittance Prices Worldwide Quarterly.”
- 39 Linnemann Bech, Faruqui, and Shirakami, “Payments Without Borders.”
- 40 Financial Stability Board, “Enhancing Cross-Border Payments—Stage 1 Report to the G20.”
- 41 Solvej Karla Krause, Harish Natarajan, and Helen Luskin Gradstein, *Distributed Ledger Technology (DLT) and Blockchain (English)*, FinTech Note No. 1 (Washington, DC: World Bank Group, 2017), <http://documents.worldbank.org/curated/en/177911513714062215/Distributed-Ledger-Technology-DLT-and-blockchain>.
- 42 Krause, Natarajan, and Luskin Gradstein, *Distributed Ledger Technology (DLT) and Blockchain (English)*.
- 43 Research and Markets, “Global and China Mobile Payment Industry Report, 2020–2026,” Research and Markets, April 2020, accessed January 25, 2021, <https://www.researchandmarkets.com/reports/5021655/global-and-china-mobile-payment-industry-report>.
- 44 Research and Markets, “Global and China Mobile Payment Industry Report, 2020–2026.”
- 45 Samrat Sharma, “UPI Makes Massive Jump in Last 2 Years; Amitabh Kant Says UPI Will Surpass Visa, Mastercard in 3 Years,” *The Financial Express* (blog), August 26, 2020, <https://www.financialexpress.com/economy/upi-makes-massive-jump-in-last-2-years-amitabh-kant-says-upi-will-surpass-visa-mastercard-in-3-years/2066066/>.
- 46 Sharma, “UPI Makes Massive Jump in Last 2 Years.”
- 47 Ledger Insights, “Latest Digital Yuan Trial Is 10x the First. Hong Kong Cross Border Tests Start,” *Ledger Insights*, April 14, 2021, <https://www.ledgerinsights.com/latest-digital-yuan-trial-is-10x-the-first-hong-kong-cross-border-tests-start/>.
- 48 “China Digital Yuan Will Co-Exist With Alipay, WeChat, PBOC Says,” Bloomberg.com, March 25, 2021, <https://www.bloomberg.com/news/articles/2021-03-25/china-digital-yuan-will-co-exist-with-alipay-wechat-pboc-says>.
- 49 Celina Chen, “Why Mobile Payments Missed out on the Coronavirus Boom in Digital Services,” *South China Morning Post*, April 2, 2020, <https://www.scmp.com/tech/apps-social/article/3077941/chinas-mobile-payments-see-rebound-offline-vendors-reopen-after>.
- 50 “China Digital Yuan Will Co-Exist With Alipay, WeChat, PBOC Says.”
- 51 Working Group on E-CNY Research and Development of the People’s Bank of China, “Progress of Research & Development of E-CNY in China.”
- 52 Auer, Haene, and Holden, “Multi-CBDC Arrangements and the Future of Cross-Border Payments.”
- 53 BIS Innovation Hub, “Central Banks of China and United Arab Emirates Join Digital Currency Project for Cross-Border Payments.”
- 54 BIS Innovation Hub.

- 55 Eddie Yue, “A New Trend for Fintech—Cross-Border Payment,” *Hong Kong Monetary Authority*, December 4, 2020, <https://www.hkma.gov.hk/eng/news-and-media/insight/2020/12/20201204/>.
- 56 Raphael Auer et al., “CBDCs beyond Borders: Results from a Survey of Central Banks,” *BIS Papers*, Bank of International Settlements (BIS), June 2021, <https://www.bis.org/publ/bppdf/bispap116.pdf>.
- 57 Information mentioned here is from a blog post by BSN, published on January 15, 2021. This original blog post has since been deleted, <https://medium.com/bsnbase/bsn-2021-outlook-e2e6841db51b>. (The blog post has been cited by many news reports.)
- 58 “Overview,” *China Mobile Limited*, accessed July 4, 2021, <https://www.chinamobiletd.com/en/about/overview.php>.
- 59 Reuters Staff, “Fed’s Harker: Digital Central Bank Currency ‘Inevitable,’” *Reuters*, October 2, 2019, <https://www.reuters.com/article/us-usa-fed-harker-digital-idINKBN1WH1L4>.
- 60 Reuters Staff, “SWIFT Sets Up JV With China’s Central Bank,” *Reuters*, February 4, 2021, <https://www.reuters.com/article/china-swift-pboc-idUSL1N2KA0AK>.
- 61 Tom Wilson and Marc Jones, “China Proposes Global Rules for Central Bank Digital Currencies,” *Reuters*, March 25, 2021, <https://www.reuters.com/article/us-cenbanks-digital-china-rules-idUSKBN2BH1TA>.
- 62 Wilson and Jones, “China Proposes Global Rules for Central Bank Digital Currencies.”
- 63Carolynn Look, “China’s Digital Yuan Is Key Risk for Euro, ECB’s Villeroy Says,” *BloombergQuint*, June 29, 2021, <https://www.bloombergquint.com/global-economics/china-s-digital-yuan-is-key-risk-for-euro-ecb-s-villeroy-says>.
- 64 Alexandra Ma, “Inside ‘Belt and Road,’ China’s Mega-Project That Is Linking 70 Countries Across Asia, Europe, and Africa,” *Business Insider (India)*, January 31, 2018, <https://www.businessinsider.in/inside-belt-and-road-chinas-mega-project-that-is-linking-70-countries-across-asia-europe-and-africa/articleshow/62729644.cms>.
- 65 “China’s Trade With BRI Countries Surges to \$1.34 Trillion in 2019,” *Economic Times*, January 15, 2020, <https://economictimes.indiatimes.com/news/international/business/chinas-trade-with-bri-countries-surges-to-1-34-trillion-in-2019/articleshow/73271222.cms>.
- 66 Xiaoxia, “China’s Trade With BRI Countries Booms in 2019,” *XinhuaNet*, January 14, 2020, [http://www.xinhuanet.com/english/2020-01/14/c\\_138704581.htm#:~:text=China%20has%20become%20the%20biggest,BRI%20countries%2C%20GAC%20data%20showed.&text=Zou%20also%20noted%20that%20Chinese,with%20B%26R%20countries%20and%20regions](http://www.xinhuanet.com/english/2020-01/14/c_138704581.htm#:~:text=China%20has%20become%20the%20biggest,BRI%20countries%2C%20GAC%20data%20showed.&text=Zou%20also%20noted%20that%20Chinese,with%20B%26R%20countries%20and%20regions).
- 67 Zawya and Refinitiv, “BRI Connect: An Initiative in Numbers,” Refinitiv, 2019, [https://www.refinitiv.com/content/dam/marketing/en\\_us/documents/reports/refinitiv-zawya-belt-and-road-initiative-report-2019.pdf](https://www.refinitiv.com/content/dam/marketing/en_us/documents/reports/refinitiv-zawya-belt-and-road-initiative-report-2019.pdf).
- 68 Yan Liang, “RMB Internationalization and Financing Belt-Road Initiative: An MMT Perspective,” *Chinese Economy* 53, no. 4 (February 20, 2020): 317–28. <https://doi.org/10.1080/10971475.2020.1728478>.
- 69 Adva Saldinger, “New White Paper Outlines China’s Development Past and Future,” *Devex*, January 13, 2021, <https://www.devex.com/news/sponsored/new-white-paper-outlines-china-s-development-past-and-future-98898>.

- 70 Dylan Gerstel, “It’s a (Debt) Trap! Managing China-IMF Cooperation Across the Belt and Road,” Center for Strategic and International Studies (CSIS), accessed January 21, 2021, <https://www.csis.org/npfp/its-debt-trap-managing-china-imf-cooperation-across-belt-and-road>.
- 71 John Hurley, Scott Morris, and Gailyn Portelance, “Examining the Debt Implications of the Belt and Road Initiative From a Policy Perspective,” *Journal of Infrastructure, Policy and Development* 3, no. 1 (June 28, 2019): 139–75. <https://doi.org/10.24294/jipd.v3i1.1123>.
- 72 Joseph Cotterill and Jonathan Wheatley, “African Debt to China: ‘A Major Drain on the Poorest Countries,’” *Financial Times*, October 26, 2020, <https://www.ft.com/content/bd73a115-1988-43aa-8b2b-40a449da1235>.
- 73 Wu Julianna, “A Surprising Number of Countries Now Accept WeChat Pay or Alipay,” *South China Morning Post*, December 7, 2018, <https://www.scmp.com/abacus/culture/article/3029029/surprising-number-countries-now-accept-wechat-pay-or-alipay>.
- 74 James Kynge and Sun Yu, “Virtual Control: The Agenda Behind China’s New Digital Currency,” *Financial Times*, February 17, 2021, <https://www.ft.com/content/7511809e-827e-4526-81ad-ae83f405f623>.
- 75 Julie Verhage, “PayPal Moves Further Into China With UnionPay Partnership,” *Bloomberg.com*, January 23, 2020, <https://www.bloomberg.com/news/articles/2020-01-22/paypal-moves-further-into-china-with-unionpay-partnership>.
- 76 UnionPay International, “UnionPay Cards Are Extensively Accepted at Chain Supermarkets Outside Mainland China,” *UnionPay International*, 2019, <http://m.unionpayintl.com/en/mediaCenter/newsCenter/companyNews/5589.shtml>.
- 77 World Bank Group, “Remittance Prices Worldwide Quarterly.”
- 78 Remittance Prices Worldwide (RPW), “Remittance Prices Worldwide,” *World Bank Group*, December 2020, <https://remittanceprices.worldbank.org/en/resources>.
- 79 UnionPay International, “UnionPay International Partners With Interswitch East Africa (Kenya) Ltd to Accelerate Payment Digitalization,” *UnionPay International News*, September 9, 2020, <https://m.unionpayintl.com/en/mediaCenter/newsCenter/marketUpdate/6934.shtml>.
- 80 UnionPay International, “UnionPay International Partners With Interswitch East Africa (Kenya) Ltd to Accelerate Payment Digitalization.”
- 81 “Introduction,” *Cross-Border Interbank Payment System*, accessed January 21, 2021, <http://www.cips.com.cn/cipsen/7052/7057/33773/index.html>.
- 82 FARS News, “Chinese Banks Urged to Switch From SWIFT to Domestic Financial Network Amid Looming US Sanctions Over Hong Kong,” *FARS News Agency* (Tehran), July 30, 2020, <https://www.farsnews.ir/en/news/13990509000205/Chinese-Banks-Urged-Swich-frm-SWIFT-Dmesic-Financial-Newrk-Amid>.
- 83 “Introduction,” *Cross-Border Interbank Payment System* (CIPS).
- 84 “An Inside Look Into London’s Quest for the Renminbi,” *SWIFT*, September 25, 2019, <https://www.swift.com/news-events/news/inside-look-londons-quest-renminbi>.
- 85 “An Inside Look Into London’s Quest for the Renminbi.”

- 86 Muyu Xu and Aizhu Chen, "UPDATE 1-China's 2020 Crude Oil Imports Hit Record on Stockpiling, New Refineries," *Reuters*, January 14, 2021, <https://www.reuters.com/article/china-economy-trade-crude-idUSL1N2JP07X>.
- 87 Shanghai Futures Exchange, "Crude Oil Futures," *Shanghai Futures Exchange Notice*, March 21, 2018, <http://www.shfe.com.cn/content/2018-yyQH-en/index.html>.
- 88 Tom Daly, Mai Nguyen, and Emily Chow, "RPT-China's New Copper Futures Add Another Card to Global Yuan Deck," *Reuters*, November 17, 2020, <https://www.reuters.com/article/china-derivatives-copper-idUKL1N2I30GE>.
- 89 Thomas Hale, "China Oil Futures Hit Record Levels," *Financial Times*, January 31, 2021, <https://www.ft.com/content/877b3676-5236-4d90-bfbc-b0683faa5af8>.
- 90 Hale, "China Oil Futures Hit Record Levels."
- 91 Shanghai Futures Exchange (SHFE), "Overview," *Shanghai Futures Exchange*, accessed January 21, 2021, <http://www.shfe.com.cn/en/aboutus/introduction/overview/>.
- 92 CP Chandrasekhar and Jayati Ghosh, "Bilateral Swaps' Role in China's Rising Global Footprint," *Hindu Business Insider*, December, 14, 2020, <https://www.thehindubusinessline.com/opinion/bilateral-swaps-role-in-chinas-rising-global-footprint/article33330279.ece>.
- 93 Ke Song and Le Xia, "Bilateral Swap Agreement and Renminbi Settlement in Cross-Border Trade," *Bank of Finland*, September 20, 2019, <https://helda.helsinki.fi/bof/handle/123456789/16347>.
- 94 Mora, Camilo E Tovar, and Tania Mohd Nor, "Reserve Currency Blocs: A Changing International Monetary System?" IMF Working Papers. International Monetary Fund, January 24, 2018, <https://www.imf.org/en/Publications/WP/Issues/2018/01/25/Reserve-Currency-Blocs-A-Changing-International-Monetary-System-45586>.
- 95 IMF News, "IMF Adds Chinese Renminbi to Special Drawing Rights Basket," *International Monetary Fund*, September 30, 2016, <https://www.imf.org/en/News/Articles/2016/09/29/AM16-NA093016IMF-Adds-Chinese-Renminbi-to-Special-Drawing-Rights-Basket>.
- 96 Xin Dai and Julia Chen, "Belt and Road Initiative—1H2019," *Swiss Re*, February, 24, 2020, <https://www.swissre.com/institute/research/topics-and-risk-dialogues/economy-and-insurance-outlook/belt-and-road-initiative-2H2019.html>.
- 97 Standard Chartered Research, "China—Belt and Road Is Taking Shape," *On the Ground*, November 8, 2017, 13.
- 98 Liang, "RMB Internationalization and Financing Belt-Road Initiative: An MMT Perspective."
- 99 Bureau of Fiscal Services, U.S. Department of Treasury, "2020 Final Monthly Treasury Statement" (Washington, DC: U.S. Department of Treasury, 2020), accessed January 22, 2021, <https://fiscal.treasury.gov/files/reports-statements/mts/mts0920.pdf>.
- 100 "An Update to the Budget and Economic Outlook: 2021 to 2031" (Washington, DC: Congressional Budget Office, July 2021), <https://www.cbo.gov/>.
- 101 "Dollar Index Spot (DXY) Spot Rate—Bloomberg Markets," *Bloomberg.com*, accessed January 22, 2021, <https://www.bloomberg.com/quote/DXY:CUR>.

- 102 Serkan Arslanalp and Chima Simpson-Bell, “US Dollar Share of Global Foreign Exchange Reserves Drops to 25-Year Low,” *IMFBlog*, International Monetary Fund, May 5, 2020, <https://blogs.imf.org/2021/05/05/us-dollar-share-of-global-foreign-exchange-reserves-drops-to-25-year-low/>.
- 103 International Monetary Fund, “Currency Composition of Official Foreign Exchange (CoFR).”
- 104 Dimitri Simes, “China and Russia Ditch Dollar in Move Towards ‘Financial Alliance,’” *Financial Times*, August 16, 2020, <https://www.ft.com/content/8421b6a2-1dc6-4747-b2e9-1bbfb7277747>.
- 105 Simes, “China and Russia Ditch Dollar in Move Towards ‘Financial Alliance.’”
- 106 Chris Devonshire-Ellis, “The Shanghai Cooperation Organisation November 2020 Summit Overview,” *Silk Road Briefing*, Dezan Shira & Associates, November 16, 2020, <https://www.silkroadbriefing.com/news/2020/11/16/the-shanghai-cooperation-organisation-november-2020-summit-overview/>.
- 107 Silk Road Briefing, “BRICS Bank to Move Away From US Dollar Loans,” *Silk Road Briefing*, Dezan Shira & Associates, August 6, 2019, <https://www.silkroadbriefing.com/news/2019/08/06/brics-bank-move-away-us-dollar-loans/>.
- 108 Natasha Turak, “Russia’s Central Bank Governor Touts Moscow Alternative to SWIFT Transfer System as Protection From US Sanctions,” *CNBC*, May 23, 2018, <https://www.cnn.com/2018/05/23/russias-central-bank-governor-touts-moscow-alternative-to-swift-transfer-system-as-protection-from-us-sanctions.html>.
- 109 RIA Novosti, “В МИД Не Исклучили Появления в России Альтернативы SWIFT,” РИА Новости, April, 4, 2021, <https://ria.ru/20210405/swift-1604223374.html>.
- 110 RIA Novosti, “В МИД Не Исклучили Появления в России Альтернативы SWIFT.”
- 111 Dipanjan Roy Chaudhury, “India-Russia-China Explore Alternative to SWIFT Payment Mechanism,” *Economic Times*, November, 14, 2019, <https://economictimes.indiatimes.com/news/economy/foreign-trade/india-russia-china-explore-alternative-to-swift-payment-mechanism/articleshow/72048472.cms>.
- 112 “Introduction.” *Cross-Border Interbank Payment System* (CIPS).
- 113 Laurence Norman, “EU Ramps Up Trade System With Iran Despite U.S. Threats,” *Wall Street Journal*, March 31, 2020, <https://www.wsj.com/articles/eu-ramps-up-trade-system-with-iran-despite-u-s-threats-11585661594>.
- 114 Barry Eichengreen and Masahira Kawai, *Renminbi Internationalization: Achievements, Prospects, and Challenges* (Washington, DC: Brookings Institution Press, February 2015).
- 115 Yian ke, “Buyer Beware: China’s Uneven Financial Market Reform Presents Risks for Foreign Investors,” *New Perspectives on Asia* (blog), Center for Strategic and International Studies, accessed June 1, 2021, <https://www.csis.org/blogs/new-perspectives-asia/buyer-beware-chinas-uneven-financial-market-reform-presents-risks>.
- 116 Barry Eichengreen and Masahira Kawai, “*Renminbi Internationalization: Achievements, Prospects and Challenges*” (Washington, D.C: Brookings Institution Press, February 2015).
- 117 Laura Silver, Cat Devlin, and Christine Huang, “Unfavorable Views of China Reach Historic Highs in Many Countries,” Pew Research Center, October 6, 2020, <https://www.pewresearch.org/global/2020/10/06/unfavorable-views-of-china-reach-historic-highs-in-many-countries/>.
- 118 Silver, Devlin, and Huang, “Unfavorable Views of China Reach Historic Highs in Many Countries.”

- 119 Colby Smith, "Powell Advances Fed Work on Possible 'Digital Dollar,'" *Financial Times*, May 20, 2021, <https://www.ft.com/content/ca4875dc-b7ed-463c-aa3f-941694d5f284>.
- 120 Jeannette Neumann and Francine Lacqua, "Lagarde Says ECB Could Have Digital Currency within Four Years," *BNN Bloomberg*, March 31, 2021, <https://www.bnnbloomberg.ca/lagarde-says-ecb-could-have-digital-currency-within-four-years-1.1584643>.
- 121 Richard Wike, Janell Fetterolf, and Mara Mordecai, "U.S. Image Plummet Internationally as Most Say Country Has Handled Coronavirus Badly," *Pew Research Center's Global Attitudes Project* (blog), Pew Research Center, September 15, 2020, <https://www.pewresearch.org/global/2020/09/15/us-image-plummets-internationally-as-most-say-country-has-handled-coronavirus-badly/>.





1779 Massachusetts Avenue NW | Washington, DC 20036 | P: + 1 202 483 7600

[CarnegieEndowment.org](https://www.CarnegieEndowment.org)