

1/8

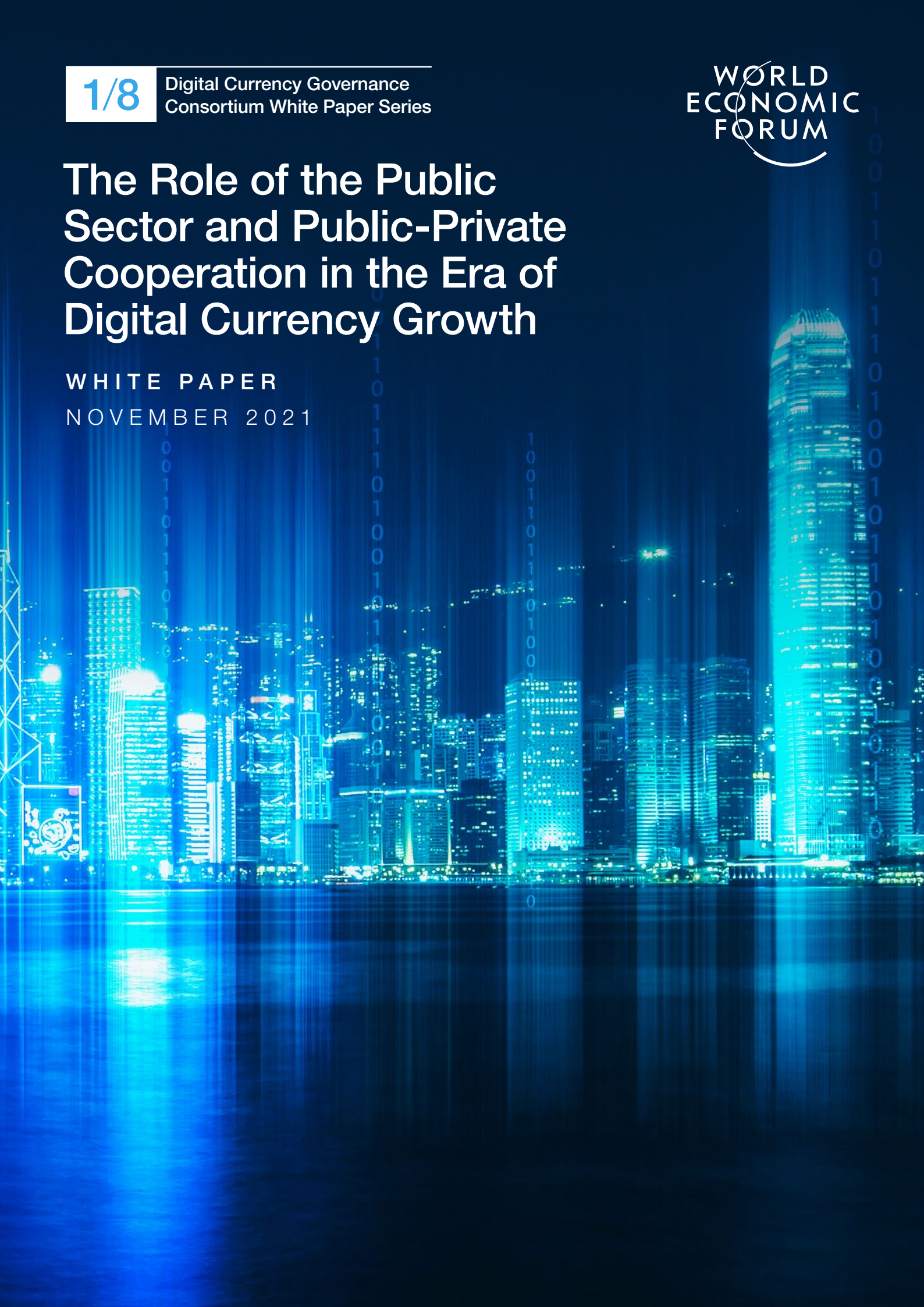
Digital Currency Governance  
Consortium White Paper Series

WORLD  
ECONOMIC  
FORUM

# The Role of the Public Sector and Public-Private Cooperation in the Era of Digital Currency Growth

WHITE PAPER

NOVEMBER 2021



# Contents

Preface	3
1 Public sector mandates for CBDC and stablecoin governance	4
2 Public sector roles	6
2.1 Public sector and stablecoins	7
2.2 Public sector and CBDC	9
3 Areas for public-private cooperation	12
3.1 Public-private cooperation on stablecoins	13
3.2 Public-private cooperation on CBDC	14
4 Areas for intergovernmental collaboration	18
4.1 Prevention of illicit activity	19
4.2 Consumer protection, data privacy and data management	19
4.3 Technical interoperability and coordination over cross-border and multilateral CBDC arrangements	20
4.4 Cross-border CBDC macroeconomic spillover effects and risks	21
Conclusion	23
Endnotes	24

This white paper is part of the [Digital Currency Governance Consortium White Paper Series](#). Its authors, contributors and acknowledgements can be found in that compendium report.

## Disclaimer

This document is published by the World Economic Forum as a contribution to a project, insight area or interaction. The findings, interpretations and conclusions expressed herein are a result of a collaborative process facilitated and endorsed by the World Economic Forum but whose results do not necessarily represent the views of the World Economic Forum, nor the entirety of its Members, Partners or other stakeholders.

© 2021 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

# Preface

This paper explores potential roles that central banks and public institutions could take with respect to stablecoins and CBDCs. It also highlights key opportunities for public-private and intergovernmental cooperation.

Public sector institutions globally have been increasingly called upon to take actions, develop perspectives and maintain oversight of emerging forms of digital currency. This paper highlights the most important roles and actions that the public sector can engage in with respect to two forms of digital currency: central bank digital currency (CBDC) and stablecoins. It aims to serve as a starting point, highlighting sets of actions available to policy-makers.

While CBDC and stablecoins should be considered distinctly, as they are very different forms of digital currency, their respective treatment by the public sector can be interconnected. For instance, CBDC may be issued to stimulate competition in the payment markets (including among stablecoin providers) or mitigate currency substitution risk from a widely adopted global stablecoin (or foreign CBDC). Or a government may mandate that dominant stablecoin-providers or private payment service-providers (PSP) should fully back customer holdings with reserves held at the central bank (a concept referred to as “synthetic CBDC” in this paper) – in which case, policy-makers may find less need to issue CBDC for payment stability purposes.<sup>1</sup>

This report seeks to help public sector institutions identify the roles they should play to support the kind of responsible innovation in stablecoins or CBDC that protects citizens and the financial system from risks, while allowing for beneficial technological advances. It is rooted in the mandates the public sector bears. Notably, it highlights the most important areas of public-private cooperation, based on the assumption that the private sector is well-placed to offer innovative technical solutions. It also highlights key areas for intergovernmental cooperation. It assumes that each country has distinct policy goals and political-economy constraints that inform their actions (or inactions) towards CBDC or stablecoins.

The paper identifies a range of roles, activities and opportunities which are not necessarily either independent or mutually exclusive. Policy-makers and the private sector can engage in multiple actions related to stablecoins or CBDC at the same time, and these efforts can be symbiotic depending on priorities and goals. In some cases, they may find these actions to be unnecessary, given a jurisdiction’s particular interests and conditions.

1

# Public sector mandates for CBDC and stablecoin governance

Central banks, finance ministries and regulatory or oversight bodies have multiple mandates that relate to stablecoins and CBDC, both directly and indirectly. Generally, central banks are tasked to maintain certain levels of employment and price stability using monetary policy. Their purview often extends to areas related to the oversight and management of monetary, financial and payment systems. In the words of the [European Central Bank](#) (ECB): “By pursuing its tasks of maintaining monetary and financial stability and the smooth operation of payment systems, [the ECB] ensures that money and payments serve European society. We have always been committed to maintaining confidence in our currency, which has meant adapting the form of money and payment services we provide to the changing ways in which people spend, save and invest.”<sup>2</sup>

In a speech in August 2020, US Federal Reserve [Governor Lael Brainard](#) expanded on this concept: “The introduction of Bitcoin and the subsequent emergence of stablecoins with potentially global

reach, such as Facebook’s Libra [now Diem], have raised fundamental questions about legal and regulatory safeguards, financial stability, and the role of currency in society. This prospect has intensified calls for CBDCs to maintain the sovereign currency as the anchor of the nation’s payment systems.”<sup>3</sup>

Regulatory and oversight bodies, meanwhile, have mandates that apply more directly to private stablecoin initiatives. For example, the US Securities and Exchange Commission (SEC) is charged with protecting investors, maintaining fair, orderly and efficient markets, and facilitating market integrity and capital formation. Looking at Europe, the [European Securities and Markets Authority](#) (ESMA) is responsible for “enhancing the protection of investors and promoting stable and orderly financial markets.”<sup>4</sup>

Table 1 presents a summary of common mandates for public sector financial institutions and oversight bodies. These mandates inform the potential appropriate roles of various institutions with respect to CBDC and stablecoin governance.

“

**The emergence of stablecoins with potentially global reach has raised fundamental questions about legal and regulatory safeguards, financial stability, and the role of currency in society.**

US Federal Reserve Governor Lael Brainard



TABLE 1 | Mandates for public sector financial institutions

<b>Consumer protection</b>	<p>Consumer protection in the financial space generally falls to a country's financial regulator. For example, in Australia, the <a href="#">Australian Securities and Investments Commission</a> (ASIC) regulates “corporate, markets, financial services and consumer credit...It also licenses and regulates individuals and businesses that engage in consumer credit activities. In addition, ASIC’s market regulation role makes it responsible for supervising financial market operators and participants, including real-time trading on Australia’s domestic licensed markets.”<sup>5</sup></p>
<b>Financial stability</b>	<p>Financial stability is a goal shared across many government bodies. Those institutions that touch the financial sector often have a mandate to maintain financial stability. For example, the <a href="#">Financial Stability Oversight Council</a> (FSOC) is a collaborative body chaired by the US Treasury Secretary that creates “collective accountability for identifying risks and responding to emerging threats to financial stability.”<sup>6</sup> It is made up of representatives from the Federal Reserve, Office of the Comptroller of the Currency, Consumer Financial Protection Bureau, Securities and Exchange Commission, Federal Deposit Insurance Corporation, Commodity Futures Trading Commission, Federal Housing Finance Agency and National Credit Union Administration.</p>
<b>Monetary stability</b>	<p>Central banks commonly adhere to core mandates centred on price stability, often in tandem with mandates related to high employment. As expressed by the <a href="#">Swiss National Bank</a> (SNB), “Article 99 of the Federal Constitution entrusts the SNB, as an independent central bank, with the conduct of monetary policy in the interests of the country as a whole. The mandate is explained in detail in the National Bank Act (art. 5 para. 1), which requires the SNB to ensure price stability and, in so doing, to take due account of economic developments.”<sup>7</sup></p>
<b>Competitive markets</b>	<p>Most countries have opted to create governmental bodies solely responsible for maintaining competition. For example, Canada has its <a href="#">Competition Bureau</a>, “an independent law enforcement agency, [which] ensures that Canadian businesses and consumers prosper in a competitive and innovative marketplace.”<sup>8</sup> Finland has its competition and consumer protection authority in one body: the Finnish Competition and Consumer Authority. The US relies on the Federal Trade Commission and the US Department of Justice’s Antitrust Division.</p>
<b>Market integrity</b>	<p>Market integrity is a broad mandate that falls under the remit of numerous regulators. <a href="#">In the context of regulation</a>, it is generally understood to mean the elimination of market abuse activities, creation of non-discriminatory access to the market, transparent and accurate information about the prices of securities and accurate information about issuers of securities.<sup>9</sup></p>
<b>Prevention of illicit activity</b>	<p>Countries regulate their financial and professional sectors for anti-money laundering and combating the financing of terrorism (AML/CFT) based on the Financial Action Task Force (FATF) Recommendations. These include requirements for financial institutions to apply risk-based preventive measures against money laundering and terrorist financing (e.g. customer due diligence/KYC, sanctions screening and reporting suspicious transactions to authorities). These actions need to be supported by supervising compliance with these obligations and building law enforcement capacity to investigate suspected illicit activity. The <a href="#">FATF Recommendations</a> were amended in 2019 to explicitly require regulation of digital currencies and those providing digital currency services; the guidance was updated in October 2021, specifying how FATF standards apply to stablecoins and definitions for virtual assets, among other issues.<sup>10</sup></p>

2

# Public sector roles

As a first step, the public sector has a responsibility to develop an understanding and awareness of relevant global trends and issues with respect to stablecoins and CBDC. Beyond this, some major roles that public sector institutions such as central

banks, finance ministries and regulatory bodies could take with respect to stablecoins and CBDC are explored in this section. Actions under the stablecoins column are not mutually exclusive.

TABLE 2 Major public sector roles and activities on stablecoins and CBDC

Stablecoins	CBDC
Monitoring and regulation	Creation of CBDC
Actions that support innovation	Monitoring, research or experimentation
Granting central bank reserve access	Alternatives to CBDC issuance



## 2.1 Public sector and stablecoins

### Monitoring and regulation

Regulatory bodies should carefully consider regulating stablecoins to preserve financial stability, support consumer protection and provide other safeguards to the public and to financial and monetary systems. Regulators should conduct a thorough review of the risks presented by stablecoins to their jurisdictions, alongside a review of existing laws and regulations. Special attention should be paid to the quality, liquidity and transparency of reserve assets backing stablecoins (see further discussion on digital “run risk” under the section [Granting central bank reserve access](#) below).<sup>11</sup> Critical attention should also be paid to the risk and prevention of illicit activity, such as money laundering, tax evasion and terrorist financing.

Regulators could identify policy and oversight gaps and inconsistencies with respect to stablecoins and seek to fill those. They could look to examples from other regions and consider the present and future risks stablecoins may present.<sup>12</sup> For instance, transparency, frequent disclosure and independent auditing requirements for stablecoin reserves and financial management could enhance the financial integrity of stablecoins and protect users. Left unchecked, widely held stablecoins with poor financial management could present significant risks to users as well as to financial systems. In extreme cases, policy-makers could even ban the use of stablecoins for certain activities, given the risks they may pose.

### Actions that support innovation

Given the nascent nature of stablecoins and blockchain technology, many jurisdictions have opted to create regulatory “sandboxes” that allow companies to test offerings and innovate in a controlled environment with few regulatory requirements. Sandboxes have dual benefits. They allow companies to better understand how their services will work; and they allow regulators to better identify any gaps and problems in existing regulations and any new regulatory concerns that may arise. Examples of regulatory sandboxes with stablecoin or blockchain-related participants are widespread and include: the UK [Financial Conduct Authority’s \(FCA\) sandbox](#) with several projects, such as a blockchain-based [e-money platform](#);<sup>13</sup> the [European Commission’s](#) pan-European blockchain regulatory sandbox;<sup>14</sup> a blockchain-based delivery-versus-payment (DvP) settlement system between

Regulators should, as far as possible, aim to develop policies that are “future-proof” and remain relevant as the technology and industry evolve. Policy flexibility and agility in the face of market developments would also be beneficial. Monitoring of stablecoin trends, risk areas and developments, as well as international regulatory developments involving stablecoins, are essential to inform policy-making and regulation.

When it comes to stablecoins and the use of blockchain, it is essential that regulatory frameworks are consistent across geographies to the greatest extent possible, as consistency can prevent mismatching regulatory frameworks that enable regulatory arbitrage and gaps. Consistency with existing regulation is also important and can be aligned with the principle – “same business, same risks, same rules”.

For a detailed framework to identify regulatory and policy gaps and inconsistencies, please refer to the white paper in this report series entitled [Regulatory and Policy Gaps and Inconsistencies of Digital Currencies](#). For recommendations with respect to consumer protection, please refer to the white paper entitled [Digital Currency Consumer Protection Risk Mapping](#).

the Japanese yen and crypto assets [in Japan](#);<sup>15</sup> and tests in the [Bank of Russia’s](#) regulatory sandbox.<sup>16</sup>

In another approach, the New York Department of Financial Services (NYDFS) hosted a regulatory [TechSprint](#) – essentially a government-sponsored “hackathon”, where teams developed solutions to improve regulatory reporting for virtual currency companies.<sup>17</sup> These events allow regulators and innovators to interface and develop solutions to novel problems facing regulators.

Lastly, policy-makers might consider roles they can play in mandating or facilitating interoperability among stablecoins, to the extent it can support competitiveness and avoid network effects or closed-loop stablecoin systems that could lead to higher prices and lower convenience to users.

## Granting central bank reserve access

A third, important type of public sector action relates to granting (or potentially requiring) stablecoin providers direct reserve access at the central bank. A synthetic CBDC constitutes a public-private partnership scheme where the stablecoin issuer (or other private issuer of digital money) fully backs reserves directly at the monetary authority or similar institution. The public sector can decide whether to allow or require this arrangement. A similar arrangement with less public sector involvement could require the stablecoin issuer to hold reserves with a commercial bank in a manner that is remote from bankruptcy of the bank and fully backed by reserves with the central bank (rather than partially backed as would be standard deposits).

These approaches involve multiple complexities that should be carefully considered. That said, they can be an important step in reducing the risk of a run on stablecoin reserves – where users lose confidence in the ability to redeem their stablecoins for physical cash or bank deposits, given problems at the stablecoin issuer or general market volatility, and redeem their stablecoins *en masse*. The risk of a run on some stablecoins

remains a concern today, where a few have rapidly amassed billions of dollars of customer deposits without necessarily adhering to comprehensive regulatory requirements and oversight of typical deposit-taking institutions, or providing adequate transparency or guarantees as to the quality, liquidity and redeemability of reserve assets.<sup>18</sup>

These schemes could serve as complements to regulation in managing risks associated with stablecoins. Full-reserve backing with a central bank (either directly at the central bank as with synthetic CBDC or in bankruptcy-remote accounts with a commercial bank as intermediary) would improve consumer protection and the stablecoin's financial integrity. Users could have a first claim on the provider's reserves or other assets in the event of its insolvency. It is important to note that the stablecoin digital currency would remain an ultimate liability of the issuer and not the central bank; it would therefore not be considered a CBDC by definition. Researchers at the International Monetary Fund (IMF), European Central Bank and World Economic Forum have written further on this subject of synthetic CBDC.<sup>19</sup>

TABLE 3 Key considerations for “synthetic CBDC” and stablecoin direct reserve access<sup>20</sup>

<b>Identification of programme goals and motivations</b>	<ul style="list-style-type: none"> <li>– Clear identification of goals, concerns or risks related to stablecoins present in the economy that could be meaningfully addressed through allowing or requiring fully backed reserves directly at the central bank.</li> <li>– Clear identification of the types of issuers who would or would not qualify for reserve access.</li> </ul>
<b>Consumer protection and risk management considerations</b>	<ul style="list-style-type: none"> <li>– Specification of reserve policies, legal structures and protections for user funds in case of issuer insolvency.</li> <li>– Oversight regimes, auditing, cybersecurity protections and other requirements for stablecoin issuers to ensure stability and meet the goals and objectives of the programme.</li> </ul>
<b>Legal considerations</b>	<ul style="list-style-type: none"> <li>– Pre-existing statutory or policy constraints that might prevent the central bank from allowing reserve access to non-bank institutions.</li> <li>– Appropriate regulatory and compliance policies, including KYC/AML/CFT capabilities.</li> </ul>
<b>Issues related to monetary policy</b>	<ul style="list-style-type: none"> <li>– Examination of monetary impacts, including with respect to effects on the central bank balance sheet, seigniorage<sup>21</sup> and commercial banks (who could compete for deposits and become disintermediated).</li> <li>– Consideration of how the central bank reserve rate will affect the digital currency issuer (a negative reserve rate could be passed on to the issuer or users).</li> </ul>



The risk of a run on some stablecoins remains a concern today, where a few have rapidly amassed billions of dollars of customer deposits without necessarily adhering to comprehensive regulatory requirements





## 2.2 Public sector and CBDC

### Creation of CBDC

Central banks and national policy-makers can decide whether to create a CBDC and, if so, in what form and with what private sector role. For example, should PSPs or commercial banks play an intermediary role providing custody and other services related to CBDC assets (referred to in this paper as a “two-tiered CBDC”)? Or should end-users hold accounts with the central bank directly?

CBDC issuance should stem from a rigorous evaluation of the policy objectives or goals that the CBDC could support, and the capabilities and opportunities that it could enable. These should be closely weighed alongside alternative methods of achieving those goals or opportunities, and the downsides and risks arising from the CBDC. Multi-stakeholder input and public consultations on potential CBDC issuance are very important and are likely to critically inform CBDC design and eventual adoption.<sup>22</sup> If the benefits from the envisaged CBDC do not outweigh the risks and downsides, then the CBDC should not be created, although

policy-makers may wish to continue research and observation of related work around the world in case their position changes.

The policy goals that CBDC can support include the following:

- Mitigating currency substitution risk
- Payment system safety and resilience
- Financial inclusion
- Domestic or cross-border payment efficiency
- Monetary policy implementation
- Payment and banking system competitiveness
- Continued access to central bank money for the general public
- Household fiscal transfers

For further discussion, see the whitepaper in this report series entitled [CBDC Technology Considerations](#).

Different forms of CBDC are outlined in Figure 1.

FIGURE 1 | Different forms of CBDC<sup>23</sup>

	Domestic	Cross-border
Retail	Financial and non-financial users could hold accounts of digitized central bank money	Foreign financial and non-financial users could hold accounts of digitized central bank money
Wholesale	Akin to electronic central bank reserves	Foreign financial institutions could hold accounts of digitized central bank money

Several technical design choices are available for CBDC. Policy-makers must consider these, along with foreign access. For example, would CBDC be available to foreign entities and, if so, which types (e.g. tourists and foreign visitors, or overseas firms)?<sup>24</sup> As part of this decision, policy-makers should evaluate whether providing foreign access contributes to any policy goals or institutional mandates. They should robustly analyse the risks and complexities related to cross-border access, including exchange rate volatility, implications for domestic monetary policy, financial stability, the central bank balance sheet, or risks related to illicit fund flows. Negative consequences to overseas economies, such as those stemming from capital flight or loss of monetary control should also be considered and are discussed later in this paper (see Table 7).

Additional questions to address before creating a CBDC include: will there be any restrictions or additional requirements for certain types of

domestic or overseas entities? For example, higher identification requirements, or varying levels of access to certain types of international financial or non-financial entities.

If policy-makers decide to issue a CBDC, next steps include important choices for design, technology infrastructure, governance and implementation strategy. The World Economic Forum’s [Central Bank Digital Currency Policy-Maker Toolkit](#) provides a framework to guide policy-makers in the CBDC decision-making process.<sup>25</sup> *The CBDC Pyramid* presented by researchers from the Bank for International Settlements (BIS) provides a valuable model for identifying a CBDC’s technical design and architecture, including the role of the private sector.<sup>26</sup> Initiatives and research such as the [UK’s CBDC Taskforce](#), the [Riksbank’s e-krona](#) efforts or the BIS report [Central bank digital currencies: Foundational principles and core features](#) can also inform approaches and design for CBDC creation.<sup>27</sup>

### Monitoring, research or experimentation

The central bank may decide not to move directly towards CBDC development, instead monitoring CBDC developments around the world while staying abreast of and potentially contributing to research and technical experimentation. This allows it to stay up to date with the latest research, trends and findings related to CBDC, including those that can affect its economy. A flexible wait-and-see approach could be appropriate given the extensive impact (and reputational risk) that a new CBDC system could have on an economy, particularly a new, widely available retail CBDC. The central bank could also learn from work conducted in other countries without expending significant resources. If the value proposition of a CBDC in a given country becomes stronger over time, its policy-makers could change their stance towards use-cases and development.

Policy-makers can follow ongoing CBDC research through:

- Accessing online resources that compile and share research publicly<sup>28</sup>

- Attending international meetings, discussions and working groups related to CBDC
- Engaging with international organizations such as the IMF, BIS or World Economic Forum
- Developing bilateral relationships with CBDC research teams around the world

Before taking a wait-and-see approach, any first-mover advantages pertaining to CBDC issuance could be evaluated. One example of a potential first-mover advantage could be the setting of data or software standards for use in cross-border CBDC arrangements in the future. That said, such activity may not be that valuable for central banks. On balance, it is likely to prove more harmful than beneficial to create CBDC too quickly. Policy-makers should also monitor for risks to their jurisdictions posed by foreign CBDC, discussed in more detail in [section 4.4](#) below.

“ It is likely to prove more harmful than beneficial to create CBDC too quickly

## Alternatives to CBDC issuance

If relevant public sector institutions have reviewed the CBDC concept and determined that issuing a CBDC would not provide value to their citizens or the economy, or that resourcing is too constrained to design and develop a CBDC in the near or intermediate term, they may choose inaction towards CBDC. As with the approach of monitoring and researching CBDC projects described below, they may re-engage with the CBDC concept at any point in the future, learning from the work conducted until that point.

Although around 85% of central banks are engaging in CBDC research and development in some manner [according to the BIS](#), very few

economies (and no major developed economies as of the time of writing) have definitively concluded to develop or issue a CBDC.<sup>29</sup> Considering the risks of CBDC and the few cogent arguments for a first-mover advantage, central banks should not feel pressured to develop or experiment with CBDC if the case for their presence in the economy is not yet compelling.

There are numerous potential alternative solutions to meet the same policy goals that CBDC can provide and it may be the case that CBDC does not have a strong value proposition for various economies. Table 4 presents a non-exhaustive set of alternative solutions to various common CBDC policy goals.

TABLE 4 **Alternative public sector-led solutions to meet CBDC policy goals**

<b>To address financial inclusion</b>	<ul style="list-style-type: none"> <li>– Financial and digital literacy and education programmes.<sup>30</sup></li> <li>– Providing a monetary incentive for citizens to open and use a private financial account.</li> </ul>
<b>To stimulate competition in payment or deposit markets</b>	<ul style="list-style-type: none"> <li>– Regulation of PSPs, stablecoin issuers, cryptocurrency issuers, foreign CBDC, the banking sector, other financial organizations or digital currencies in question. For instance, dominant payment platforms or stablecoin providers may follow heightened regulations or hold reserves in the central bank in a partial or fully backed manner. Similarly, a country may decide to ban the use of a certain digital currency.</li> <li>– Additional antitrust and pro-competition policies.</li> </ul>
<b>To improve efficiency and reduce cost of payment services</b>	<ul style="list-style-type: none"> <li>– Legislation such as caps on retail transaction or credit card fees, limits to minimum account balances, or the establishment of open-banking and data-sharing requirements.</li> <li>– The development of a domestic “fast payments” retail system.</li> <li>– For international payments – bilateral or multi-lateral efforts, such as those connecting the fast payment systems of multiple countries.<sup>31</sup></li> <li>– Creation of technical standards that can enhance interoperability for payment providers at both the application and the transaction-settlement layers.</li> </ul>
<b>For payment stability and resilience</b>	<ul style="list-style-type: none"> <li>– Investment in technical resilience of new or pre-existing domestic payment and settlement systems.</li> </ul>



3

# Areas for public-private cooperation



The question is where do you draw the line of what the public sector does and what the private sector does. The fundamental question is about issuing. Does the public sector issue and the private distribute or do we also allow the private sector to issue?

Tommaso Mancini-Griffoli, International Monetary Fund<sup>32</sup>

Public-private partnerships and cooperation in finance and industry are not new. Respecting local governments and laws, each jurisdiction must make its own decisions about how the public sector should cooperate with the private sector with respect to digital currency innovation and growth. Moreover, responses and approaches to public-private innovation may differ between developed economies, where banks and traditional financial institutions are well established, and emerging economies, where banking systems may be less established yet fintech ecosystems are strong.

Notwithstanding this, the expertise and core competencies of the private sector in technology innovation, user growth and adoption, customer

service and other areas should be considered and valued. Often, the public sector cannot match the scale and pace of private industry research and development. Cooperation can enable government and public sector bodies to keep up with and benefit from private sector innovation.

Failure by the public sector to cooperate with the private sector and leverage its expertise where relevant can lead to deficiencies in some areas of technical expertise, unnecessary effort or reinventing the wheel, an inability for a public sector solution such as CBDC to connect with private sector financial services and tools, regulatory and policy gaps, and broader unintended negative consequences to the payments industry and financial services.

TABLE 5 Areas for public-private cooperation

Stablecoins	CBDC
Regulatory consultation	Consultations on CBDC
Innovation hubs, regulatory sandboxes and joint efforts	Sharing of knowledge and expertise from the private sector
Synthetic CBDC development (central bank reserve access)	Joint piloting and experimentation
Prevention of illicit activity	Two-tiered retail CBDC development
	Efforts supporting merchant acceptance and interoperability with private payment systems

## 3.1 Public-private cooperation on stablecoins

### Regulatory consultation

The public sector can solicit feedback on the regulatory treatment of stablecoins from the private sector (as well as from civil society organizations, public citizens and other stakeholders).

Consultations allow the public sector to gain perspectives and ideas on innovations and tactics, and to learn about any unintended consequences or externalities about a regulatory proposal. Recent examples include the crypto-assets consultation by the UK Treasury,<sup>33</sup> the consultations conducted by the European Commission regarding the Markets in Crypto-Assets Regulation (MiCA) effort,<sup>34</sup> and

the recent Financial Action Task Force (FATF) consultation on stablecoin guidance.<sup>35</sup>

Given the complexity and novelty of stablecoins, the private sector and other relevant organizations can help regulators understand the nature of business activities more quickly and clearly, clarify relevant risks, and provide suggestions in the process of formulating and revising rules. Stablecoin issuers should strive to be as transparent and cooperative as possible in their financial and technical operations.

### Innovation hubs, regulatory sandboxes and joint efforts

As discussed earlier, the public sector can cooperate with the private sector to design and implement appropriate and valuable regulatory sandboxes, innovation hubs, hackathons or other efforts that can support innovation and small-scale testing. It may also identify other formats in which to work

with the private sector in supporting innovation and experimentation. The public sector may participate in initiatives started or led by the private sector.

For instance, Temasek, Singapore's state-owned investment company, [joined the Libra Association](#) (now the Diem Association) in May 2020.<sup>36</sup>

### Synthetic CBDC development (central bank reserve access)

As discussed, if a stablecoin has gained significant adoption, then that jurisdiction may want to take steps to counter the risks posed by the dominant stablecoin system and require that it fully back its reserves directly with the central bank (synthetic CBDC).<sup>37</sup> Undoubtedly, the stablecoin issuer would play important roles in this scheme, including but not limited to its pre-existing functions of

customer screening and due diligence, user data management, user interface and experience, software development and integration, customer service, wallet development and cybersecurity.<sup>38</sup> Meanwhile, the central bank would perform transaction settlements along with creating the necessary compliance and regulatory guidelines.

### Prevention of illicit activity

Public-private fora for sharing information on illicit finance risks and issues related to stablecoins could be constructive to address the risks identified by major regulatory and oversight bodies. As an example of such an effort related

to cryptocurrency more broadly, the US Treasury Department's FinCEN has established a virtual currency information-sharing initiative with participation from the private sector including virtual currency money transmitters.<sup>39</sup>

## 3.2 Public-private cooperation on CBDC

### Consultations on CBDC

CBDC can have substantial impacts on the economy and society, including on commercial banks, credit card networks and PSPs. The central bank should consult with these and other relevant parties (including civil society organizations, citizens and other stakeholders) to gather information on innovation strategies as well as risks and unintended consequences to these parties. Thorough and ongoing industry consultation should be a cornerstone of CBDC development.

Consultation and engagement can occur through documents published online, seminars, roundtable events, advisory groups and training sessions, among other avenues. The [Bank of Thailand](#), the [Bank of England](#) and the [ECB's](#) consultations and external working groups on potential CBDC issuance serve as recent examples.<sup>40</sup> Moreover, the [EU Outreach sessions](#) are an example of open sessions where participants can discuss key issues with public sector officials in real time.<sup>41</sup>

### Sharing of knowledge and expertise from the private sector

The public sector can benefit widely from the knowledge, experience and expertise of the private sector with respect to elements of digital currency that can help a CBDC achieve its intended goals, gain adoption, and operate safely and securely. Examples of expertise the private sector can share with the public sector include:

- Consumer education and adoption strategies
- End-user UI/UX for CBDC accessibility and usability
- Customer service and account management
- Customer data management and privacy

- Cybersecurity, technical resilience and risk management
- Fraud and illicit activity detection

Hackathons can be used to learn best practices and expertise from the private sector and other ecosystem participants. The BIS Innovation Hub and SWIFT's [ISO 20022 and API hackathon](#) is one example.<sup>42</sup> Another is the [Global CBDC Challenge](#), led by the Monetary Authority of Singapore (MAS), where private-sector providers are invited to submit innovative solutions to specific technology challenges related to CBDC.<sup>43</sup>

“ Hackathons can be used to learn best practices and expertise from the private sector and other ecosystem participants



## Joint piloting and experimentation

Central banks have been conducting joint CBDC experimentation with private sector entities, most commonly commercial banks or securities exchanges, for the past few years. Examples include the [Bank of Canada's Project Jasper](#),<sup>44</sup> the [National Bank of Cambodia's Project Bakong](#),<sup>45</sup> the Hong Kong Monetary Authority and Bank of Thailand's [Project Inthanon-LionRock](#),<sup>46</sup> and the BIS and Swiss Digital Exchange's [Project Helvetia](#).<sup>47</sup> In other examples, the central bank can be an observer to experimentation among private sector organizations,

as seen with the [Bank of Spain and five commercial banks](#) experimenting with a blockchain-based platform for SEPA Instant Credit Transfer payments.<sup>48</sup>

Joint experimentation with relevant parties can enable CBDC testing in a manner that is more realistic and can more widely explore CBDC opportunities and functionalities that leverage the private sector. The central bank could lead working groups with retail banks and other businesses during project design, execution and testing.

## Two-tiered retail CBDC development

In a two-tiered retail CBDC implementation, customers hold CBDC accounts with commercial banks or other private-sector financial organizations. The central bank issues CBDC to the financial intermediary who distributes it to citizens and other entities. The private sector organization serves as the user-facing intermediary, conducting and leveraging pre-existing expertise in customer due diligence and compliance processes, customer service and account management, IT security and other processes. The two-tiered model alleviates the burden on the central bank to perform these activities. CBDC remains a claim on the central bank. The exact structure of two-tiered CBDC can vary, but models could include the intermediary holding fully backed reserves at the central bank corresponding to customer CBDC deposits, or dedicated customer-specific balances within the intermediary's central bank reserve accounts.

Central banks who wish to implement two-tiered CBDC must decide the roles and responsibilities they and the private sector will conduct, to benefit from each other's core competencies and complementary capabilities. Adequate regulation and supervision are imperative for any intermediaries distributing CBDC. Intermediaries acting as PSPs may need to abide by existing payment services regulations related to security, transparency, data access, consumer protection and more.

Central bank and private sector participants can collaborate on the development and

implementation of appropriate consumer protection standards, and where necessary identify clear allocations of liabilities between parties (for example in the event of fraudulent behaviour). A two-tiered CBDC should protect consumers' interests and give them the confidence necessary for in-person and online transactions. It should also ensure that consumers understand those protections and how they may differ from those offered by other payment methods.

The private sector may contribute more generally to public awareness-building and capacity development with the use of the CBDC. This might include informational and educational communications or campaigns. Such efforts can support the inclusion of the broader public in the CBDC programme, helping achieve financial inclusion goals and universal access.

The development and ongoing operation of a two-tier CBDC may require private sector participants to undertake a range of costly activities, including the development of intuitive user experiences, integration with new payment infrastructure and the enablement of various links in the payment value chain. Policy-makers may need to consider how best to balance costs and incentivization for the private sector. To ensure a vibrant and competitive ecosystem of payment innovators, the public and private sectors may need to establish a system of incentives that enables private sector participants to generate an appropriate return on their investments.





## Efforts supporting merchant acceptance and interoperability with private payment systems

The public and private sectors should cooperate to ensure that a newly created CBDC can interact with private sector payment systems, so that its value to users is maximized and to avoid fragmented or closed-loop systems. Interoperability both among CBDC wallets provided by different financial organizations (e.g. two-tiered CBDC) and between CBDC and other payment and deposit facilities is likely to be necessary. While the central bank may establish and enforce technology and data standards supporting such interoperability, consultation with the private sector can inform standards and other requirements and help ensure fairness for private sector players engaging with CBDC.

Moreover, enabling integration with pre-existing payment messaging systems would allow consumers and businesses the freedom to choose whether to settle a given obligation using funds from their CBDC account or commercial bank account. Ensuring interoperability across different value storage accounts and payment systems will facilitate user satisfaction and economic efficiency and is likely to reinforce the role of central bank money at the heart of the economy. Achieving maximum interoperability is a challenging task, particularly in advanced economies where the banking and payment ecosystems are highly complex and developed. Active public-private collaboration will be critical to achieving this goal.

Merchant CBDC acceptance is another important issue. How will the infrastructure around the CBDC ensure that consumers can safely and conveniently use their holdings of CBDC funds to pay, in person or online, at a wide variety of merchants? Enabling acceptance points is one of the greatest challenges to driving mass adoption of any new payment solution. One approach to accelerating the acceptance of a CBDC could be to collaborate with existing acceptance networks, such as those provided by global card networks, domestic debit schemes, and a growing range of QR and “pay by account” solutions.

Interoperability with existing payment solutions would help ensure wide acceptance at the point of sale. This suggests that the public and private sectors should also work together to understand where existing payments infrastructure, such as real-time payment and automated clearing house (ACH) systems, might be leveraged to support the deployment of a CBDC, or where the policy objectives of the CBDC demand the development of new infrastructure. If a CBDC network is designed with the principles of open architecture, open connectivity and interoperability, it would support ease of integration across payment networks towards more seamless and end-to-end transaction processing. In this process, the participation and contribution of private institutions is likely to be essential. For in-depth discussions of interoperability, refer to the white paper in this report series entitled [Defining Interoperability](#).

“ Enabling acceptance points is one of the greatest challenges to driving mass adoption of any new payment solution



## Additional recommendations

The following is a set of additional considerations and recommendations for public-private engagement with respect to CBDC and stablecoins.

### Best practices and key considerations for public-private collaboration

As the public and private sectors collaborate to build and deploy CBDCs, developing and following best practice guidelines will help enable secure, robust and scalable solutions. Key considerations to consider include the following:

- A clear list of priorities and problems to cooperate on and solve
- Consideration of learnings, frameworks or best practices from historic cooperation in the financial sector and other industries
- Avoiding vendor lock-in or entrenchment in early technology developments
- Developing a private sector partner list that is diverse and extends beyond usual partners, and implementation of public, transparent, competitive and fair RFP processes
- Implementation of a thorough due diligence process to assess the quality and qualifications of private-sector providers or other options
- Advisory committee including private-sector representatives
- Periodic and potentially independent review and audit of private sector systems that closely relate to the CBDC
- Development of governance processes for system changes, upgrades and modifications as they relate to private sector involvement

### Potential for privately created payment rails for CBDC

It is possible for the public sector to implement CBDC using payment infrastructure or databases and ledgers developed within the private sector. Several blockchain technology providers have developed permissioned or private blockchain ledgers or software frameworks that have been used extensively in experimentation. These include R3 Corda, Hyperledger Fabric and Quorum (originally developed within JP Morgan). Mostly found in wholesale CBDC experiments, these three platforms have demonstrated their ability to meet the requirements of financial infrastructure in terms of performance and reliability, although their performance in substantial full-scale deployments is not yet tested.

Performance relative to other pre-existing technology options must also be more fully investigated. Given the need for prudence with CBDC deployment and the complexity and newness of blockchain technology, the full set of risks and limitations of blockchain-based infrastructure must be strongly considered before it is employed in CBDC. For additional discussion on this topic, refer to the white paper in this report series entitled [CBDC Technology Considerations](#).

### Potential for privately created digital assets to facilitate CBDC

Existing private sector blockchain-based digital assets could potentially assist in the facilitation of cross-border wholesale interbank CBDC payments and transactions. Examples include the utility settlement coin (USC) and XRP digital assets. Such assets may serve as a “bridge currency” in cross-border interbank payments.<sup>49</sup> Before experimenting with such digital assets, policy-makers should have a clear understanding of the value-add they could provide from economic and technical perspectives, considering both pre-existing or alternative solutions and limitations or downsides.

4

# Areas for intergovernmental collaboration

“ Among the most pressing issues regarding CBDC and stablecoins are how best to prevent illicit activity and establish consumer protection and privacy measures

This section discusses the critical opportunities and areas for intergovernmental collaboration with respect to CBDC and stablecoins. Policy-makers should consider participation in global efforts such as the IMF and World Bank Group’s 2018 [Bali Fintech Agenda](#) that highlights the value of international cooperation and information-sharing for fintech developments.<sup>50</sup> The work on cross-border payment efficiency by the G20 and BIS Committee on Payments and Market Infrastructure (CPMI) is also pertinent. In their publication [Enhancing cross-border payments: building blocks of a global roadmap](#), the G20 and CPMI identify 19 building blocks for enhancing cross-border payments, premised on international cooperation. These include building block 18, which focuses on “fostering the soundness of

global stablecoin arrangements” and building block 19, which addresses “factoring an international dimension into CBDC designs”.<sup>51</sup>

The BIS has launched an innovation hub that provides extensive collaboration opportunities among global policy-makers, central banks and other public institutions. Some of its work involves private sector firms and technology start-ups. The 2021-2022 work programme, which includes multiple projects related to CBDC, can be found at the [innovation hub’s website](#).<sup>52</sup> Policy-makers should consider participating in these and other relevant efforts. The remainder of this paper expands on additional areas for intergovernmental collaboration that are critical with respect to CBDC and stablecoins.

TABLE 6 Areas for intergovernmental collaboration on CBDC and stablecoins

Prevention of illicit activity
Consumer protection, data privacy and data management
Technical interoperability and coordination over cross-border and multilateral CBDC arrangements
Cross-border CBDC macroeconomic spillover effects and risks



## 4.1 Prevention of illicit activity

One of the most pressing issues regarding CBDC and stablecoins is how best to apply, establish or enforce compliance measures to prevent money laundering, terrorist financing, tax evasion and other illicit activity. With respect to stablecoins, the Financial Action Task Force (FATF), Financial Stability Board (FSB), European Central Bank (ECB) and G7 have identified several risks and vulnerabilities to be considered.<sup>53</sup>

While CBDC is treated separately from stablecoins by some regulatory and oversight bodies, it can entail similar risks of illicit activity. The FATF treats stablecoins and CBDC separately (the former as a type of virtual asset and the latter as a type of digital fiat currency), but both are subject to AML/CFT standards.<sup>54</sup> Mandating specific identity requirements would support compliance goals, but would come at the cost of privacy and accessibility for CBDC users.<sup>55</sup> The ECB and other organizations have explored methods to compromise between compliance, privacy and access in a safe manner.<sup>56</sup> For a more in-depth discussion of privacy for CBDC, refer to the white paper in this report series entitled [Privacy and Confidentiality Options for Central Bank Digital Currency](#).

Ultimately, continued collaboration by jurisdictions through bodies such as the BIS and the FSB on CBDC design and the development of consistent and comprehensive AML/CFT rules is essential to prevent harmful activity with stablecoins and CBDC issued in the future. Information and knowledge-sharing, from low-level transaction data that can highlight potentially illicit activity to information about forthcoming policy changes, can be hugely constructive.

The avoidance of “regulatory arbitrage” opportunities through the adequate coverage and compatibility of regulatory requirements is critical to limiting the possibilities for illicit activity. The FSB, the International Organization of Securities Commissions (IOSCO) and the Basel Committee of Banking Supervision are, among others, actively considering such risks and advising on possible responses. Multilateral adherence to the recommendations articulated by such bodies can help reduce the likelihood of regulatory gaps.

To ensure that standard-setting and oversight bodies are promoting measures that effectively protect against the stablecoin risks they seek to prevent, they should engage in robust public consultations that generate understanding of these assets. Close coordination among all jurisdictions – both within oversight organizations and in bilateral communications – is vital to protect against regulatory arbitrage. This is in the context not only of recommendations related to financial stability but also of proposals that address AML/CFT, data privacy, cyber security, and consumer and investor protection. These latter concerns, if left unchecked, could all have consequences for financial stability, as recognized in the FSB’s October 2020 report, [Regulation, Supervision and Oversight of Global Stablecoin Arrangements – Final Report and High-Level Recommendations](#).<sup>57</sup>

Additional information on intergovernmental coordination in the prevention of illicit activity with globally available digital currencies can also be found in focus area B (“Coordinate regulatory, supervisory and oversight frameworks”) of the G20 and CPMI report, [Enhancing cross-border payments: building blocks of a global roadmap](#).<sup>58</sup>

## 4.2 Consumer protection, data privacy and data management

There is always considerable debate around the privacy regime that should apply to cross-border transfers of data. Many of the same considerations apply to cross-border payments in CBDC, and the issue of consumer data privacy could prove a major area for future conflict in cross-border CBDC arrangements. Moreover, where CBDC or stablecoin transactions occur across borders, governments must establish appropriate practices for the sharing, owning or acquiring of end-user account data in order to ensure its security and privacy. While some data will need to be shared for the purposes of tax collection, regulation enforcement and curbing illicit transactions, policy-makers should coordinate globally to develop

responsible data-sharing protocols that meet these needs, while respecting user data privacy, especially as data leaves a citizen’s home country.

Additional information on this topic can be found in “Building Block 6: Reviewing the interaction between data frameworks and cross-border payments” in the aforementioned G20 and CPMI report, [Enhancing cross-border payments: building blocks of a global roadmap](#).<sup>59</sup> The [OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data](#) and the Group of Thirty (G30) report, [Digital Currencies and Stablecoins: Risks, Opportunities, and Challenges Ahead](#) can also be referenced.<sup>60</sup>



## 4.3 Technical interoperability and coordination over cross-border and multilateral CBDC arrangements

Many central banks and international bodies have emphasized the importance of CBDC interoperability in cross-border areas, should they decide to issue CBDC that is accessible to entities abroad. Advocates for this approach argue that it could significantly reduce the time, risks and costs associated with cross-border payments for business and individuals alike. Multilateral policy and technical coordination will be critical to ensuring cross-border CBDC interoperability, including as it relates to regulatory requirements, risk control measures, and data and other standards (existing standards such as ISO 20022 can be leveraged).<sup>61</sup>

Cross-border CBDC interoperability features in the joint work of the BIS with several central banks in their 2020 report [Central bank digital currencies: foundational principles and core features](#). It is worth quoting part of this report in full below:

*“...for CBDC systems, their additional functionalities and future designs may require these [payment messaging] standards to be enhanced and for central banks to work collaboratively in their development. Similarly, if CBDC systems are linked with supplementary systems and data services (e.g. digital identity repositories), then commensurate international standards may be required for seamless*

*cross-border payments. New systems based on different technologies (e.g. token-based) may also present challenges.”*<sup>62</sup>

“Multi-CBDC” (mCBDC) arrangements are being considered and evoke renewed questions about the value of a multilateral currency instrument.<sup>63</sup> In February, the Hong Kong Monetary Authority (HKMA), the Bank of Thailand (BOT), the Central Bank of the United Arab Emirates (CBUAE) and the Digital Currency Institute of the People’s Bank of China (PBC DCI) announced they would collaborate on a cross-border CBDC project, moving from Project Inthanon-LionRock to the [Multiple Central Bank Digital Currency \(m-CBDC\) Bridge Project](#).<sup>64</sup> Furthermore, in the March 2021 BIS report [Multi-CBDC arrangements and the future of cross-border payments](#), the authors point out three conceptual approaches to cross-border CBDC interoperability, emphasizing the importance of international coordination for achieving each:

1. Enhancing compatibility of CBDCs
2. Linking multiple CBDC systems
3. Integrating multiple CBDCs in a single mCBDC system<sup>65</sup>

These multilateral CBDC arrangements demand significant cooperation and trust between central banks and the challenges in their implementation should not be underestimated. Issues that may need to be considered include:

- Status of CBDC as legal tender
- Provision of services in CBDC
- Custody, security and regulation of CBDC issued in one country and used in another
- Privacy regimes applied to cross-border CBDC
- Regulatory clarity related to the potential use of distributed ledger technology in CBDC infrastructure or user-facing applications

Nevertheless, other approaches to improve cross-border payments are also possible. In the World Economic Forum's January 2021 virtual Davos

Agenda summit, [Tharman Shanmugaratnam](#), Senior Minister of Singapore and chairman of its monetary authority, argued that CBDC might not be necessary if international interoperability and identity were solved, suggesting that private money could be used over new structures.<sup>66</sup>

Policy-makers and the private sector should collaborate to closely analyse the relative merits of developing cross-border CBDC arrangements as compared to the costs and benefits of other approaches outlined in the G20's cross-border payment roadmap, including but not limited to interlinking domestic payment systems, extending RTGS operating hours and other new multilateral platforms. If CBDCs are identified as a desirable tool for cross-border payments, careful consideration will need to be given to their architecture, including whether cross-border interoperability of the CBDC would be restricted to wholesale institutions or directly accessible to retail users.

## 4.4 Cross-border CBDC macroeconomic spillover effects and risks

Designing a CBDC that is convenient for cross-border payments might lower the cost of international transactions. Enabling easy access for tourists and foreign visitors could help those individuals, while incentivizing merchant acceptance. Yet significant foreign access to a country's CBDC could result in serious unintended consequences

to both the home country and foreign countries. Table 7 lists some potential negative consequences or international spillover effects from a cross-border CBDC with significant accessibility to foreign entities. Many of these consequences could also occur through the widespread adoption of stablecoins denominated in a foreign currency.



TABLE 7 Potential negative consequences of cross-border CBDC to issuing and foreign countries

Country A (home country): Potential unintended consequences from issuance of cross-border CBDC	Country B (foreign country): Potential unintended consequences from usage of cross-border CBDC issued by country A
Currency appreciation and exchange rate volatility	Currency depreciation and exchange rate volatility
Heightened risks related to cybersecurity of the CBDC or illicit activity involving the CBDC, depending on foreign accessibility (e.g. KYC requirements and other controls)	Capital flight and loss of deposits in domestic banks and investments  Currency substitution or “dollarization” and loss of monetary sovereignty  Tax avoidance, money laundering or other illicit activity and general loss of oversight by domestic authorities, arising from citizen use of foreign CBDC <sup>67</sup>
Unexpectedly high operational or other costs if foreign adoption is higher than anticipated	Redundancy of payment systems  Potentially heightened data privacy or cybersecurity risks from foreign CBDC versus domestic options

To the degree to which they are adopted, stablecoins can also substantially impact macroeconomic stability, particularly in emerging economies. However, jurisdictions can use regulation to block the adoption of foreign CBDC or stablecoins. It may also be the case that jurisdictions do not extensively issue cross-border CBDCs (either because they do not clearly support domestic policy goals or because they introduce significant risks, or both), and that stablecoins are not widely adopted.

Governments and the private sector should collaborate on investigating the potential for unintended international spillover impacts of CBDCs and stablecoins, particularly where they have the potential to negatively impact developing economies. The ECB’s *Report on a digital euro*, published in October 2020, expresses concerns that a CBDC could have serious unintended consequences on foreign economies, potentially driving the substitution of domestic money and amplifying “the real and financial cross-border spillovers of domestic monetary policy shocks by creating a new channel for their propagation.”<sup>68</sup> The IMF deepens this analysis in their recent policy paper, *Digital Money Across Borders: Macro-Financial Implications*, which expresses concerns that foreign-denominated CBDCs and stablecoins could “reduce the ability of local authorities to run monetary policy” and could “raise pressures for currency substitution and worsen vulnerabilities from currency mismatches.”<sup>69</sup>

The cross-border circulation of a CBDC that does not include the necessary control mechanisms

could be used to circumvent the law outside its jurisdiction. On this subject, the [BIS and select central banks](#) write: “Transparency and coordination between central banks and other public authorities will be needed to understand and manage any unintended consequences.”<sup>70</sup>

Further study is required to identify and develop the correct policy tools to mitigate these spillover impacts and to effectively balance the risks and benefits that CBDCs and stablecoins pose to cross-border flows. As with other areas, this analysis will benefit from close public-private collaboration that brings to bear the complementary perspectives and capabilities of multiple parties.

The following resources provide additional information about the negative macroeconomic consequences of stablecoins and cross-border CBDCs:

- Bank for International Settlements, [BIS Annual Economic Report 2021 - III. CBDCs: an opportunity for the monetary system](#), 2021.<sup>71</sup>
- European Central Bank, [Central bank digital currency in an open economy](#), 2020.<sup>72</sup>
- Feyen, Erik et al., [“Digital money: Implications for emerging market and developing economies”](#), *VoxEU*, 16 January 2020.
- Ferrari, Massimo Minesso et al., [“The international dimension of a central bank digital currency”](#), *VoxEU*, 12 October 2020.<sup>73</sup>

“ Governments and the private sector should collaborate on investigating the potential for unintended international spillover impacts of CBDCs and stablecoins, particularly where they have the potential to negatively impact developing economies

# Conclusion

This paper identifies a range of different activities, roles and opportunities for the public sector, public-private cooperation and intergovernmental collaboration in the development and growth of central bank digital currency (CBDC) and stablecoins. While they are distinct and very different forms of digital currency, CBDC and stablecoins both present unique risks and opportunities. Policy-makers should carefully consider their approach to each. Their considerations will inevitably be based on domestic country conditions, policy goals and political-economy constraints. But policy-makers could apply the options presented in this paper as a starting point in determining their approach to CBDC and stablecoins.

Two themes are clear:

- Global coordination, including with the private sector, is essential
- Policy-makers have a responsibility to constituents to study, monitor and in many cases take action with respect to stablecoins and CBDC

Stablecoins present more immediate risks, as their issuance grows rapidly while regulatory coverage is currently limited. With CBDC, policy-makers have more time to wait and see. They can monitor and learn from CBDC arrangements, given their limited issuance and the low likelihood for foreign access with initial deployment.<sup>74</sup> That said, they should consider the opportunities that CBDC could provide their economies and potentially stand ready to participate in multilateral CBDC arrangements in the future, bearing in mind they may need to enact policies protecting their economies from any negative consequences of foreign cross-border CBDC.

# Endnotes

1. See:
  - 1) Researchers at the International Monetary Fund (IMF) coined this term. See Adrian, Tobias and Mancini-Griffoli, Tommaso, “Public and Private Money Can Coexist in the Digital Age”, *IMF Blog*, 18 February 2021, <https://blogs.imf.org/2021/02/18/public-and-private-money-can-coexist-in-the-digital-age/>.
  - 2) Researchers at the Bank for International Settlements (BIS) call this concept “indirect infrastructure” for CBDC, or “indirect CBDC”. See Auer, Raphael and Böhme, Rainer, *The technology of retail central bank digital currency*, BIS Quarterly Review March 2020, [https://www.bis.org/publ/qtrpdf/r\\_qt2003j.pdf](https://www.bis.org/publ/qtrpdf/r_qt2003j.pdf).
  - 3) Additional insights are available at Auer, Raphael and Böhme, Rainer, “CBDC architectures, the financial system, and the central bank of the future”, *VoxEU*, 29 October 2020, <https://voxeu.org/article/cbdc-architectures-financial-system-and-central-bank-future>.
2. European Central Bank (ECB), *Report on a digital euro*, 2020, [https://www.ecb.europa.eu/pub/pdf/other/Report\\_on\\_a\\_digital\\_euro-4d7268b458.en.pdf](https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro-4d7268b458.en.pdf).
3. Brainard, L., *An Update on Digital Currencies*, 18 August 2020, speech presented at the Federal Reserve Board and Federal Reserve Bank of San Francisco’s Innovation Office Hours, San Francisco, <https://www.federalreserve.gov/newsevents/speech/brainard20200813a.htm>.
4. “ESMA in Brief”, *European Securities and Markets Authority*, <https://www.esma.europa.eu/about-esma/esma-in-brief>.
5. “Chapter 3: Overview of ASIC”, *Parliament of Australia*, [https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Economics/ASIC/Final\\_Report/c03](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/ASIC/Final_Report/c03).
6. “About FSOC”, *US Department of the Treasury*, <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/fsoc/about-fsoc>.
7. “Monetary Policy Strategy”, *Swiss National Bank (SNB)*, [https://www.snb.ch/en/i/about/monpol/id/monpol\\_strat#t2](https://www.snb.ch/en/i/about/monpol/id/monpol_strat#t2).
8. “What is the Competition Bureau?”, *Government of Canada*, 25 September 2019, <https://www.competitionbureau.gc.ca/eic/site/cb-bc.nsf/eng/04296.html>.
9. Austin, Janet, *What Exactly is Market Integrity? An Analysis of One of the Core Objectives of Securities Regulation*, 8 Wm. & Mary Bus. L. Rev. 215 (2017), <https://scholarship.law.wm.edu/cgi/viewcontent.cgi?article=1126&context=wmbllr>.
10. See:
  - 1) Financial Action Task Force (FATF), *Virtual Assets and Virtual Asset Service Providers*, 2019, <https://www.fatf-gafi.org/media/fatf/documents/recommendations/RBA-VA-VASPs.pdf>.
  - 2) Financial Action Task Force (FATF), *Updated Guidance for a Risk-Based Approach for Virtual Assets and Virtual Asset Service Providers*, 2021, <https://www.fatf-gafi.org/publications/fatfrecommendations/documents/guidance-rba-virtual-assets-2021.html>.
11. For additional information and recommendations on risks and challenges with stablecoins, see:
  - 1) Gorton, Gary B. and Zhang, Jeffery, *Taming Wildcat Stablecoins*, 2021, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3888752](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3888752).
  - 2) Catalini, Christian and de Gortari, Alonso, *On the Economic Design of Stablecoins*, 2021, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3899499](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3899499).
  - 3) BIS, G7 and IMF, *Investigating the impact of global stablecoins*, 2019, <https://www.bis.org/cpmi/publ/d187.pdf>.
12. A mapping of regulatory approaches by countries around the world with respect to blockchain-based digital currency in general can be found at the Global Blockchain Business Council’s “Global Standards Mapping Initiative (GSMI)” website, <https://gbbccouncil.org/gsmi/>.
13. See:
  - 1) “Regulatory Sandbox”, *FCA*, 2016, <https://www.fca.org.uk/firms/innovation/regulatory-sandbox>.
  - 2) “Summary Terms – Moneyfold”, *Moneyfold*, 2021, <https://moneyfold.co.uk/terms/>.
14. “Legal and regulatory framework for blockchain”, *European Commission*, 2020, <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-blockchain>.
15. Raftery, Gavin et al. “Crypto Garage Becomes First Fintech Participant in Japan’s Regulatory Sandbox”, *Baker McKenzie*, 2019, <https://blockchain.bakermckenzie.com/2019/02/08/crypto-garage-becomes-first-fintech-participant-in-japans-regulatory-sandbox/>.
16. “Nabiullina spoke about the testing by the Central Bank of the cryptocurrency ‘stablecoins’”, *Interfax*, 25 December 2019, <https://www.interfax.ru/russia/689362> (in Russian).
17. “Techsprint”, *Department of Financial Services*, 2021, <https://www.dfs.ny.gov/techsprint>.



18. For additional information on digital run risk in stablecoins, see:
- 1) Gorton, Gary B. and Zhang, Jeffery, *Taming Wildcat Stablecoins*, 2021, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3888752](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3888752).
  - 2) Catalini, Christian and de Gortari, Alonso, *On the Economic Design of Stablecoins*, 2021, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3899499](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3899499).
  - 3) For information on historic mismanagement of reserve assets with the largest stablecoin, Tether, see “Attorney General James Ends Virtual Currency Trading Platform Bitfinex’s Illegal Activities In New York”, *Letitia James NY Attorney General*, 2021, <https://ag.ny.gov/press-release/2021/attorney-general-james-ends-virtual-currency-trading-platform-bitfinexs-illegal>.
19. See:
- 1) ECB Crypto-Assets Task Force, *Stablecoins: Implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area*, European Central Bank, 2020, <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op247~fe3df92991.en.pdf>.
  - 2) Adrian, T., *Stablecoins, Central Bank Digital Currencies, and Cross-Border Payments: A New Look at the International Monetary System*, 14 May 2019, speech presented to IMF-Swiss National Bank Conference, Zurich, <https://www.imf.org/en/News/Articles/2019/05/13/sp051419-stablecoins-central-bank-digital-currencies-and-cross-border-payments>.
  - 3) Adrian, Tobias and Mancini-Griffoli, Tommaso, “Public and Private Money Can Coexist in the Digital Age”, *IMF Blog*, 18 February 2021, <https://blogs.imf.org/2021/02/18/public-and-private-money-can-coexist-in-the-digital-age/>.
  - 4) World Economic Forum, *Central Bank Digital Currency Policy-Maker Toolkit - Appendices*, 2020, p. 11. [http://www3.weforum.org/docs/WEF\\_CBDC\\_Policy-maker\\_Toolkit\\_Appendices.pdf](http://www3.weforum.org/docs/WEF_CBDC_Policy-maker_Toolkit_Appendices.pdf).
20. See:
- 1) World Economic Forum, *Central Bank Digital Currency Policy-Maker Toolkit*, 2020, [http://www3.weforum.org/docs/WEF\\_CBDC\\_Policy-maker\\_Toolkit.pdf](http://www3.weforum.org/docs/WEF_CBDC_Policy-maker_Toolkit.pdf).
  - 2) Feyen, Eric, et al., “Digital Money: Implications for Emerging Market and Developing Economies”, *VoxEU*, 16 January 2020, <https://voxeu.org/article/digital-money-implications-emerging-market-and-developing-economies>.
21. “Seigniorage” means “profit made by a government by issuing currency, especially the difference between the face value of coins and their production costs”. Source: Oxford Languages.
22. As examples, see the ECB and Bank of Thailand’s CBDC consultations:
- 1) European Central Bank, *Report on the public consultation of a digital euro*, 2021, [https://www.ecb.europa.eu/paym/digital\\_euro/html/pubcon.en.html](https://www.ecb.europa.eu/paym/digital_euro/html/pubcon.en.html).
  - 2) Bank of Thailand, *The Way Forward for Retail Central Bank Digital Currency in Thailand*, 2021, <https://www.bot.or.th/English/PressandSpeeches/Press/2021/Pages/n2164.aspx>.
23. World Economic Forum, *Central Bank Digital Currency Policy-Maker Toolkit*, 2020, p. 10 [http://www3.weforum.org/docs/WEF\\_CBDC\\_Policy-maker\\_Toolkit.pdf](http://www3.weforum.org/docs/WEF_CBDC_Policy-maker_Toolkit.pdf).
24. For discussion of foreign or cross-border CBDC access, including to tourists or domestic visitors, see Auer, Raphael et al., *CBDCs beyond borders: results from a survey of central banks*, BIS Papers No. 116, 2021, <https://www.bis.org/publ/bppdf/bispap116.pdf>.
25. World Economic Forum, *Central Bank Digital Currency Policy-Maker Toolkit*, 2020, [http://www3.weforum.org/docs/WEF\\_CBDC\\_Policy-maker\\_Toolkit.pdf](http://www3.weforum.org/docs/WEF_CBDC_Policy-maker_Toolkit.pdf).
26. See:
- 1) Auer, Raphael et al., *Rise of the central bank digital currencies: drivers, approaches and technologies*, BIS Working Papers No. 880, 2020, p. 17, <https://www.bis.org/publ/work880.pdf>.
  - 2) Auer, Raphael et al., “Central bank digital currencies: Drivers, approaches, and technologies”, *VoxEU*, 28 October 2020, <https://voxeu.org/article/central-bank-digital-currencies-drivers-approaches-and-technologies>. The authors describe a model for determining CBDC design that begins with the CBDC architecture and continues with technical infrastructure, access levels and interlinkages with retail, wholesale and cross-border individuals and firms.
27. See:
- 1) Bank of England, *Bank of England statement on Central Bank Digital Currency* [Press release], 19 April 2021, <https://www.bankofengland.co.uk/news/2021/april/bank-of-england-statement-on-central-bank-digital-currency>.
  - 2) Riksbank, *E-krona*, <https://www.riksbank.se/en-gb/payments--cash/e-krona/>.
  - 3) Group of Central Banks, “Central bank digital currencies: foundational principles and core features”, BIS, 2020, <https://www.bis.org/publ/othp33.pdf>.
28. The World Economic Forum’s public list of research papers related to CBDC is accessible here: <https://docs.google.com/document/d/1c8iGtoG7BkPr-iufnlPELEWvtZiNtouOyJp2lYjhAEY/edit?usp=sharing>.
29. Boar, Codruta and Wehrli Andreas, *Ready, set go? - Results of the third BIS survey on central bank digital currency*, BIS, 2021, <https://www.bis.org/publ/bppdf/bispap114.htm>.

30. The impact of financial education programmes may not be well established, as biases, heuristics and emotional influences can significantly affect individuals' financial decisions regardless of educational programmes and efforts. For further discussion, see Willis (2011): *The financial education fallacy*, AER, 101(3), <https://www.aeaweb.org/articles?id=10.1257/aer.101.3.429>.
31. See The BIS Innovation Hub and MAS's Project Nexus: <https://www.bis.org/about/bisih/topics/fmis/nexus.htm>.
32. The Money Movement, "Episode 4: Full Reserve Banking, Narrow Banks for Digital Currency and the China Model", YouTube, 26 May 2020. <https://www.youtube.com/watch?v=7RhftMt4qtI>.
33. Her Majesty's Treasury, *UK regulatory approach to cryptoassets and stablecoins: Consultation and call for evidence*, 2021. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/950206/HM\\_Treasury\\_Cryptoasset\\_and\\_Stablecoin\\_consultation.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/950206/HM_Treasury_Cryptoasset_and_Stablecoin_consultation.pdf).
34. "Legal and regulatory framework for blockchain", European Commission, 2020, <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-blockchain>.
35. Financial Action Task Force, *Public consultation on FATF draft guidance on a risk-based approach to virtual assets and virtual asset service providers*, 2021, <https://www.fatf-gafi.org/publications/fatfrecommendations/documents/public-consultation-guidance-vasp.html>.
36. "The Libra Association announces new members", Libra Association, 14 May 2020, <https://www.diem.com/en-us/updates/new-members/>.
37. As a reminder, PSPs and payment platforms beyond stablecoins may also be considered for central bank reserve access.
38. World Economic Forum, *Central Bank Digital Currency Policy-Maker Toolkit - Appendices*, 2020, [http://www3.weforum.org/docs/WEF\\_CBDC\\_Policy-maker\\_Toolkit\\_Appendices.pdf](http://www3.weforum.org/docs/WEF_CBDC_Policy-maker_Toolkit_Appendices.pdf).
39. "Financial Crime Enforcement Network Exchange", US Government, 2021, <https://www.fincen.gov/resources/financial-crime-enforcement-network-exchange>.
40. See:
  - 1) Bank of Thailand, *The Way Forward for Retail Central Bank Digital Currency in Thailand*, 2021, [https://www.bot.or.th/Thai/DigitalCurrency/Documents/BOT\\_RetailCBDCPaper.pdf](https://www.bot.or.th/Thai/DigitalCurrency/Documents/BOT_RetailCBDCPaper.pdf).
  - 2) Bank of England, *Responses to the Bank of England's March 2020 Discussion Paper on CBDC*, 2021, <https://www.bankofengland.co.uk/paper/2021/responses-to-the-bank-of-englands-march-2020-discussion-paper-on-cbdc>.
  - 3) ECB, *Report on the public consultation of a digital euro*, 2021, [https://www.ecb.europa.eu/paym/digital\\_euro/html/pubcon.en.html](https://www.ecb.europa.eu/paym/digital_euro/html/pubcon.en.html).
41. "Digital Finance Outreach", European Commission, 2021, [https://ec.europa.eu/info/publications/digital-finance-outreach\\_en](https://ec.europa.eu/info/publications/digital-finance-outreach_en).
42. "BIS Innovation Hub and SWIFT launch ISO 20022 and API hackathon" [Press release], BIS, 23 February 2021, <https://www.bis.org/press/p210223a.htm>.
43. "MAS Partners with IMF, World Bank and others to launch Global Challenge for Retail CBDC Solutions" [Press release], Monetary Authority of Singapore, 28 June 2021, <https://www.mas.gov.sg/news/media-releases/2021/mas-partners-imf-world-bank-and-others-to-launch-global-challenge-for-retail-cbdc-solutions>.
44. "Digital Currencies And Fintech: Projects", Bank of Canada, 2021, <https://www.bankofcanada.ca/research/digital-currencies-and-fintech/projects/#project-jasper>.
45. "Project Bakong – The Next-Generation Mobile Payments", National Bank of Cambodia, 2021, <https://bakong.nbc.org.kh/en/>.
46. Bank of Thailand and Hong Kong Monetary Authority, *Inthanon-LionRock: Leveraging Distributed Ledger Technology to Increase Efficiency in Cross-Border Payments*, 2020, [https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Report\\_on\\_Project\\_Inthanon-LionRock.pdf](https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Report_on_Project_Inthanon-LionRock.pdf).
47. BIS, SIX Group AG and Swiss National Bank, *Project Helvetia: Settling tokenized assets in central bank money*, 2020, <https://www.bis.org/publ/othp35.htm>.
48. "Programmable instant payments in DLT networks and distribution of digital money: An interview with Juan Luis Encinas, Managing Director at Iberpay", European Payments Council, 7 January 2021, <https://www.europeanpaymentscouncil.eu/news-insights/insight/programmable-instant-payments-dlt-networks-and-distribution-digital-money>.
49. World Economic Forum, *Central Bank Digital Currency Policy-Maker Toolkit - Appendices*, 2020, pp. 9-10. [http://www3.weforum.org/docs/WEF\\_CBDC\\_Policy-maker\\_Toolkit\\_Appendices.pdf](http://www3.weforum.org/docs/WEF_CBDC_Policy-maker_Toolkit_Appendices.pdf).
50. IMF, *The Bali Fintech Agenda: A blueprint for Successfully Harnessing Fintech's Opportunities* [Press release], 11 October 2018, <https://www.imf.org/en/News/Articles/2018/10/11/pr18388-the-bali-fintech-agenda>.
51. BIS, Committee on Payments and Market Infrastructures, *Enhancing cross-border payments: building blocks of a global roadmap – Stage 2 report to the G20 – technical background report*, 2020, <https://www.bis.org/cpmi/publ/d194.pdf>.
52. "BIS Innovation Hub Work Programme", Bank for International Settlements, 2021, <https://www.bis.org/topic/fintech/hub/programme.htm>.

53. See:
- 1) Financial Action Task Force, *FATF Report to the G20 Finance Ministers and Central Bank Governors on So-called Stablecoins*, 2020, <https://www.fatf-gafi.org/media/fatf/documents/recommendations/Virtual-Assets-FATF-Report-G20-So-Called-Stablecoins.pdf>.
  - 2) Financial Stability Board (FSB), *Regulation, Supervision and Oversight of "Global Stablecoin" Arrangements - Final Report and High-Level Recommendations*, 2020, <https://www.fsb.org/wp-content/uploads/P131020-3.pdf>.
  - 3) ECB, ECB Crypto-Assets Task Force, *Stablecoins: Implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area*, 2020, <https://www.ecb.europa.eu/pub/pdf/scopops/ecb.op247~fe3df92991.en.pdf>.
  - 4) BIS, G7 Working Group of Stablecoins, *Investigating the impact of global stablecoins*, October 2019, <https://www.bis.org/cpmi/publ/d187.pdf>.
54. Financial Action Task Force, *FATF Report to the G20 Finance Ministers and Central Bank Governors on So-called Stablecoins*, 2020, p. 26, <https://www.fatf-gafi.org/media/fatf/documents/recommendations/Virtual-Assets-FATF-Report-G20-So-Called-Stablecoins.pdf>.
55. For further discussion, see BIS, *BIS Annual Economic Report 2021*, 2021, p. 72 <https://www.bis.org/publ/arpdf/ar2021e3.pdf>.
56. For example, see ECB, *Exploring anonymity in central bank digital currencies*, 2019, <https://www.ecb.europa.eu/paym/intro/publications/pdf/ecb.mipinfocus191217.en.pdf?3824c3f26ad2f928ceea370393cce785>.
57. FSB, *Regulation, Supervision and Oversight of Global Stablecoin Arrangements - Final Report and High-Level Recommendations*, 2020, <https://www.fsb.org/wp-content/uploads/P131020-3.pdf>.
58. BIS, Committee on Payments and Market Infrastructures, *Enhancing cross-border payments: building blocks of a global roadmap – Stage 2 report to the G20 – technical background report*, 2020, <https://www.bis.org/cpmi/publ/d194.pdf>.
59. BIS, Committee on Payments and Market Infrastructures, *Enhancing cross-border payments: building blocks of a global roadmap – Stage 2 report to the G20 – technical background report*, 2020, <https://www.bis.org/cpmi/publ/d194.pdf>.
60. See:
- 1) OECD, *OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data*, 2013, <https://www.oecd.org/sti/ieconomy/oecdguidelinesontheprotectionofprivacyandtransborderflowsofpersonaldata.htm>.
  - 2) Group of Thirty, *Digital Currencies and Stablecoins: Risks, Opportunities, and Challenges Ahead*, 2020, [https://scholar.harvard.edu/files/rogoff/files/g30\\_digital\\_currencies\\_and\\_stablecoins.pdf](https://scholar.harvard.edu/files/rogoff/files/g30_digital_currencies_and_stablecoins.pdf).
61. See:
- 1) Auer, Raphael et al., *CBDCs beyond borders: results from a survey of central banks*, BIS Papers No. 116, 2021, <https://www.bis.org/publ/bppdf/bispap116.pdf>.
  - 2) The Bank of Canada, the Bank of England and the MAS explored in a 2018 paper the interoperability of blockchains between different CBDC systems, data standards, and legal and regulatory considerations: Bank of Canada, Bank of England, Monetary Authority of Singapore, *Cross-Border Interbank Payments and Settlements: Emerging opportunities for digital transformation*, 2018, <https://www.bankofengland.co.uk/-/media/boe/files/report/2018/cross-border-interbank-payments-and-settlements.pdf?la=en&hash=48AADDE3973FCB451E725CB70634A3AAFE7A45A3>.
  - 3) The Bank of Thailand and Hong Kong Monetary Authority also discussed cross-system interoperability in the Project Inthanon-LionRock: Bank of Thailand and Hong Kong Monetary Authority, *Inthanon-LionRock: Leveraging Distributed Ledger Technology to Increase Efficiency in Cross-Border Payments*, 2020, [https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Report\\_on\\_Project\\_Inthanon-LionRock.pdf](https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/Report_on_Project_Inthanon-LionRock.pdf).
  - 4) Lastly, in Project Jasper in 2017, the Bank of Canada proposed that the interoperability of domestic and global financial markets and infrastructure is not only very important for payment and settlement, but also necessary for effective support of global business activities: Chapman, James et al., *Project Jasper: Are Distributed Wholesale Payment Systems Feasible Yet?*, Bank of Canada, 2017, <https://www.bankofcanada.ca/wp-content/uploads/2017/05/fsr-june-2017-chapman.pdf>.
62. Group of Central Banks, *Central bank digital currencies: foundational principles and core features*, BIS, 2020, p. 7 <https://www.bis.org/publ/othp33.pdf>.
63. Auer, Raphael et al., *Multi-CBDC arrangements and the future of cross-border payments*, BIS Papers No. 115, 2021, <https://www.bis.org/publ/bppdf/bispap115.pdf>.
64. Hong Kong Monetary Authority, *Joint statement on Multiple Central Bank Digital Currency (m-CBDC) Bridge Project* [Press release], 23 February 2021, <https://www.hkma.gov.hk/eng/news-and-media/press-releases/2021/02/20210223-3/>.
65. Auer, Raphael et al., *Multi-CBDC arrangements and the future of cross-border payments*, BIS Papers No. 115, 2021, <https://www.bis.org/publ/bppdf/bispap115.pdf>.
66. World Economic Forum, "Resetting Digital Currencies (Option 2)", *The Davos Agenda*, Virtual, 2021, <https://www.weforum.org/events/the-davos-agenda-2021/sessions/resetting-digital-currencies-2>.
67. Auer, Raphael et al., *CBDCs beyond borders: results from a survey of central banks*, BIS Papers No. 116, 2021, <https://www.bis.org/publ/bppdf/bispap116.pdf>.

68. ECB, *Report on the public consultation of a digital euro*, 2021, [https://www.ecb.europa.eu/pub/pdf/other/Report\\_on\\_a\\_digital\\_euro-4d7268b458.en.pdf](https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro-4d7268b458.en.pdf).
69. IMF, *Digital Money Across Borders: Macro-Financial Implications*, 2020, <https://www.imf.org/en/Publications/Policy-Papers/Issues/2020/10/17/Digital-Money-Across-Borders-Macro-Financial-Implications-49823>.
70. See:
- 1) Auer, Raphael et al., *CBDCs beyond borders: results from a survey of central banks*, BIS Papers No. 116, 2021, <https://www.bis.org/publ/bppdf/bispap116.pdf>.
  - 2) Group of Central Banks, *Central bank digital currencies: foundational principles and core features*, BIS, 2020, <https://www.bis.org/publ/othp33.pdf>.
71. For further discussion, see BIS, *BIS Annual Economic Report 2021 - III. CBDCs: an opportunity for the monetary system*, 2021, <https://www.bis.org/publ/arpdf/ar2021e3.pdf>.
72. Ferrari, Massimo Minesso et al., *Central bank digital currency in an open economy*, European Central Bank, 2020, <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2488-fede33ca65.en.pdf?ac12ca088c73513aca6012ea1e3671d2>.
73. 1) Feyen, Eric, et al., "Digital Money: Implications for Emerging Market and Developing Economies", *VoxEU*, 16 January 2020, <https://voxeu.org/article/digital-money-implications-emerging-market-and-developing-economies>.
- 2) Ferrari, Massimo Minesso et al., "The international dimension of a central bank digital currency", *VoxEU*, 12 October 2020, <https://voxeu.org/article/international-dimension-central-bank-digital-currency>.
74. Owing to the greater complexity of enabling CBDC access to foreign entities, it is unlikely that most central banks will implement CBDC with immediate foreign/cross-border access. Many central banks are still unsure of the foreign access they will enable. For further information, see Bank for International Settlements, Auer, Raphael et al., *CBDCs beyond borders: results from a survey of central banks*, BIS Papers No. 116, 2021, <https://www.bis.org/publ/bppdf/bispap116.pdf>.



---

COMMITTED TO  
IMPROVING THE STATE  
OF THE WORLD

---

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

---

**World Economic Forum**  
91–93 route de la Capite  
CH-1223 Cologny/Geneva  
Switzerland

Tel.: +41 (0) 22 869 1212  
Fax: +41 (0) 22 786 2744  
contact@weforum.org  
www.weforum.org