

IMF Publication

IMF Approach to Central Bank Digital Currency Capacity Development

INTERNATIONAL MONETARY FUND



April 10, 2023

IMF APPROACH TO CENTRAL BANK DIGITAL CURRENCY CAPACITY DEVELOPMENT

IMF staff regularly produces papers proposing new IMF policies, exploring options for reform, or reviewing existing IMF policies and operations. The following document(s) have been released and are included in this package:

- The **Staff Report** prepared by IMF staff and completed on March 29, 2023.

The report prepared by IMF staff and presented to the Executive Board in an informal session on April 7, 2023. Such informal sessions are used to brief Executive Directors on policy issues. No decisions are taken at these informal sessions. The views expressed in this paper are those of the IMF staff and do not necessarily represent the views of the IMF's Executive Board.

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International Monetary Fund
Washington, D.C.



March 29, 2023

IMF APPROACH TO CENTRAL BANK DIGITAL CURRENCY CAPACITY DEVELOPMENT

EXECUTIVE SUMMARY

The level of global interest in Central Bank Digital Currencies (CBDCs) is unprecedented. Retail CBDC issuance is being explored in over 100 countries. Several central banks have already launched pilots or even issued a CBDC. At the same time, CBDC is a new and rapidly evolving topic with limited real-world experience. IMF member countries exploring CBDCs are looking for answers to questions and are eager to learn lessons from other members.

The IMF's Digital Money Strategy, endorsed by its Executive Board in July 2021, gives the institution a mandate to help ensure that digital money fosters domestic and international economic and financial stability. CBDC, in particular, will likely have important implications for monetary policy, financial stability, and the international monetary system (IMS). The IMF must monitor, and advise on, digital money developments for all members.

Given its mandate and global membership, the IMF is uniquely well-placed to offer advice to countries across different regions and income groups. Over 40 countries have approached the IMF to request assistance through CBDC capacity development (CD).

IMF CBDC CD efforts have focused on facilitating peer learning and developing analytical underpinnings for staff advice to member countries. In all CD efforts, IMF staff strive to be trusted advisors to country authorities. In these early days of CBDC exploration, CD missions have aimed at helping country authorities answer questions about *how* to think about CBDCs instead of whether they *should* pursue CBDCs under certain conditions. Looking forward, with more available country experiments and empirical evidence, IMF CD will evolve to provide increased value-added advice that is more tailored to country circumstances and is more solidly anchored in empirical and analytical work, and strengthen synergies with surveillance.

To document emerging lessons and results from analytical work in a fast-moving field, IMF staff will launch a CBDC Handbook as the basis for CD engagement. The Handbook will be a reference for policymakers and central bank experts, particularly in emerging market and developing economies (EMDEs). It will be a major project—about

20 chapters envisaged over the next four to five years, with chapters produced or updated each year. The CBDC Handbook will also be a “living” document reflecting evolving experiences, findings, and policy views. The Handbook will help countries ascertain whether CBDC makes sense for them and make well-informed decisions.

The Handbook will identify the most frequently asked questions related to CBDC.

The questions are bundled into five priority areas: (1) policy objectives and operational framework of CBDC; (2) foundational requirements and readiness to issue CBDC, such as legal considerations, cyber resilience, central bank governance, and regulation and supervision; (3) CBDC design processes, considerations, and choices; (4) project approaches and technology; and (5) potential macrofinancial impacts of CBDC. The Handbook chapters will provide mostly a framework for structuring CBDC exploration, and recommendations will be drawn from international best practices and be conditional on country circumstances.

The Handbook chapters are being prepared sequentially; an initial wave of chapters is slated for publication around the 2023 Annual Meetings.

These chapters are prioritized for three reasons: (1) they provide a methodological framework for conducting CBDC exploration; (2) they address the most common requests that IMF staff encounter in CD engagement; and (3) they are based on relatively well-established knowledge and experiences.

The Handbook will be written following close collaboration with member countries and other international organizations.

Staff will follow a three-step approach: (1) develop Fintech Notes on CBDC topics to seek comments inside and outside the IMF; (2) brief the IMF Executive Board on key policy messages extracted from the Fintech Notes; and (3) publish subsequent waves of Handbook chapters around the time of Annual Meetings. Consultation with member countries and other international organizations will help extract common practices.

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Glossary

AE	Advanced Economy
AML	Anti-Money Laundering
API	Application Programming Interface
BCRP	BCRP Banco Central de Reserva del Perú
BIS	Bank for International Settlements
BSP	Bangko Sentral ng Pilipinas
CBDC	Central Bank Digital Currency
CBJ	Central Bank of Jordan
CD	Capacity Development
CFMs	Capital Flow Management Measures
CFT	Combating the Financing of Terrorism
CPMI	Committee on Payments and Market Infrastructures
DLT	Distributed Ledger Technology
EMDE	Emerging Market and Developing Economy
FSB	Financial Stability Board
IMF	International Monetary Fund
JSA	Japan Subaccount
MCM	Monetary and Capital Markets
PoA	Proof of Assumptions
wCBDC	Wholesale Central Bank Digital Currency

INTRODUCTION

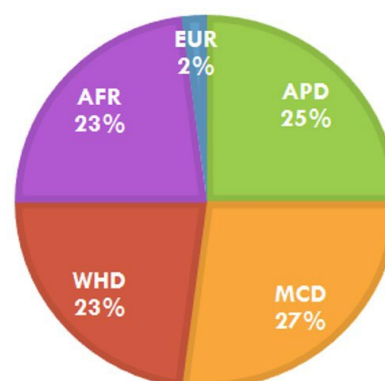
1. The growing interest in CBDC is truly global. Recent surveys have provided insights into the widespread exploration of CBDCs as well as the reasoning behind it. The Bank for International Settlements' (BIS) most recent CBDC survey, conducted in 2021, covered a record 81 central banks, representing close to 76 percent of the world's population and 94 percent of global economic output (BIS 2022). The survey found that nine out of 10 central banks are now exploring CBDCs, with half developing or running concrete experiments. The survey also showed that more than two-thirds of central banks are likely to issue a retail CBDC in the short or medium term (within the next six years). The Atlantic Council (2023) separately tracks CBDC developments in 119 countries and indicates similar results.

2. CBDC explorations have accelerated during the COVID-19 pandemic, often in response to the emergence of crypto assets.¹ The reasons for exploring CBDC differ somewhat between advanced economies (AEs) and EMDEs, however. Overall, CBDC work in AEs is driven primarily by the desire to maintain and strengthen the institutional underpinnings of modern monetary systems in the digital age, to promote competition in the payment systems, and to facilitate tokenization of finance. In addition to these considerations, CBDC work in EMDEs is also driven by financial inclusion-related motivations. Over the past two years, cross-border payment efficiency has become a more important motivation for CBDC work in EMDEs.

3. Amid rising global interest in CBDC, demand from IMF member countries for CD in the area of CBDC has increased sharply. Over 40 requests for assistance from low-income countries and large emerging market economies in all regions have been received since 2020 (Figure 1). More requests are anticipated. Ongoing bilateral CD and regional workshops have taken place in many countries, covering a broad array of topics, ranging from objectives and design choices to pilots and analysis of macrofinancial impacts.

4. In July 2021 the IMF Executive Board approved a digital money strategy which recognizes the macro relevance of digital money and fintech developments, requires the

Figure 1. Regional Distribution of CBDC CD Requests (As of February 2023)



Source: IMF Staff.

¹ Crypto assets are privately issued digital tokens that depend primarily on cryptography and distributed ledger technology. Crypto assets include unbacked tokens (which do not hold reserves but rely on market forces to set prices) and backed tokens, such as so-called stablecoins (which aim to maintain a stable value relative to a specified asset or to a basket of assets).

institution to assist and advise countries in this space, and gives it the means to do so (IMF 2021).

As outlined in this strategy, the IMF has a mandate to ensure that widespread adoption of digital money fosters domestic and international economic and financial stability. The IMF must monitor, and advise on, this rapid and complex transition for all members. CBDC, in particular, has implications for monetary policy, financial stability, and the international monetary system (IMS).

5. Against this backdrop, this paper sketches a multi-year strategy to address frequently asked questions related to CBDC and outlines the process of developing a CBDC Handbook.

Targeted and forward-leaning CD engagements must rely on solid foundations. They must be grounded in country experiences, in careful analysis, and in broad consultation.² The foundations will also need to be updated regularly in such a rapidly evolving field. To document emerging lessons, analytical findings, and policy views, IMF staff propose to produce a CBDC Handbook. This paper (1) explains the IMF's approach to CBDC CD; (2) summarizes member countries' emerging questions and challenges regarding CBDC; and (3) introduces the CBDC Handbook by motivating its scope and elucidating its governance structure.

CURRENT APPROACH TO CBDC CAPACITY DEVELOPMENT

6. The IMF is a global leader in CD delivery, providing tailored, actionable, and sound technical advice to member countries, grounded in thorough analysis, experience, and lessons from the field. CBDC CD differs from that traditionally offered by the IMF on other topics. CBDC is a new and rapidly changing topic with limited real-world experience. IMF CBDC CD efforts have focused on facilitating peer learning and developing analytical underpinning for staff advice to member countries. It is therefore a process of collaboration between the IMF and member countries. The MCM Technical Assistance Annual Report 2022 (IMF 2022a) highlights the work performed during the year by a team of experts, supporting member countries in their thinking, design, and implementation of CBDCs both bilaterally and regionally.

7. Currently, bilateral CD on CBDC provides hands-on advice to countries that seek assistance. Regional workshops help build awareness and share experiences and lessons.

Bilaterally, engagements in CBDC exploration have taken place in almost 30 countries (see Box 1 for an example on bilateral engagement). CBDC workshops were delivered in the African region, Caribbean region, and in Asia Pacific countries. Topics included an overview of objectives; macrofinancial implications; legal, technology, and interoperability issues; as well as country experiences and lessons. All these bilateral and regional workshops have involved multiple IMF departments.

² The Handbook will strive to provide, as much as feasible, cross-country experiences, elaborating on what has worked and what has not worked in other countries and why.

Box 1. CBDC CD to the Central Bank of Jordan

At the request of the Central Bank of Jordan (CBJ), the IMF provided assistance to the CBJ to explore CBDC and lay the foundation for a feasibility study. Starting in late 2021, the mission took place in three phases, including knowledge-sharing seminars, peer-learning workshops, and fieldwork. The mission team consisted of IMF staff from multiple departments and a short-term external consultant.

Knowledge-sharing seminars

The mission first hosted for the CBJ staff weekly virtual seminars over two months. The seminars covered conceptual and operational issues related to CBDC, including opportunities, challenges, design options, technology and cybersecurity risks, legal and regulatory frameworks, and macrofinancial implications. This phase helped the authorities identify the issues they would need to consider in a possible feasibility study of CBDC.

Peer-learning workshops

During the second phase, the mission offered virtual workshops featuring four guest speakers from other central banks who shared their experiences and insights from their CBDC experiments. These workshops enabled the CBJ to exchange views with other jurisdictions on key elements of their CBDC thinking-through process. The workshops helped CBJ staff deepen its understanding of CBDC design and benefit from lessons learned by other central banks.

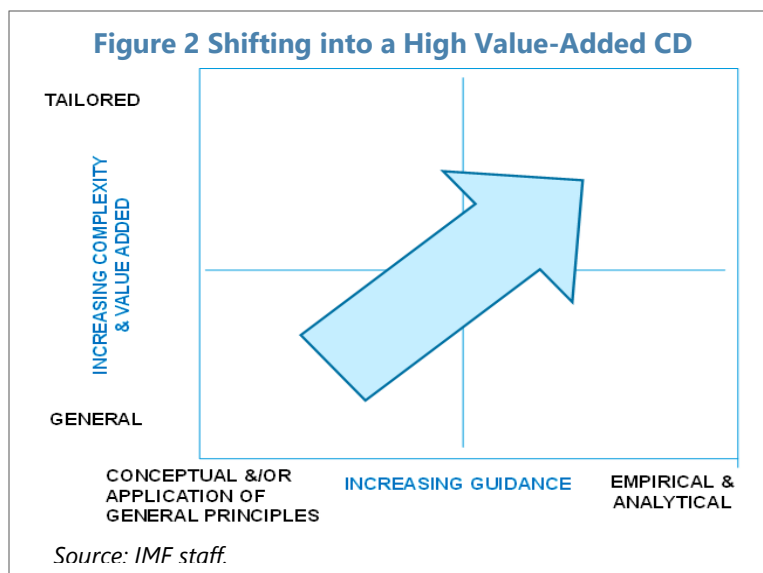
Fieldwork

During the third phase, the mission conducted a detailed analysis of use cases, opportunities, and challenges through a combination of virtual and in-person discussions. During the fieldwork in Amman, the mission held in-depth discussions with market participants and officials of the relevant authorities. This phase resulted in two technical assistance reports on key findings and recommendations. The reports address a range of issues, including the payment landscape and pain points; opportunities and challenges associated with wholesale and retail CBDCs; the requirements for technology, cybersecurity, legal, and regulatory issues in preparation for a potential CBDC; and a recommended course of action in the short to medium term.¹¹

¹¹A high-level summary of the report on retail CBDC exploration has been published. [Jordan: Retail Central Bank Digital Currency Exploration \(imf.org\)](https://www.imf.org/en/Publications/Working-Papers/2022/01/01/jordan-retail-central-bank-digital-currency-exploration).

8. Bilateral CD and regional workshops are being complemented by analytical work intended to strengthen policy lines and provide empirical support. To date, IMF CD has mostly focused on bringing countries up to speed by discussing relatively general questions related to CBDC. However, demand is shifting, as policymakers are now considering CBDC more concretely. IMF CD will need to

evolve to provide increased value-added advice that is more tailored to country circumstances and is more solidly anchored in empirical and analytical work, and strengthen synergies with surveillance (Figure 2). This shift will require IMF advice to be more normative and anchored in policy experience and frameworks in future CD.³ In turn, this will require more consultation with member countries and the IMF Executive Board, as well as a means to consolidate and share insights.



9. The IMF will prioritize CBDC CD to countries. The IMF is currently meeting requests with budget augmentation and donor funding to ensure evenhandedness. With increasing demand, however, the IMF will need to prioritize CBDC CD by taking a risk-management approach to countries that are systemically important and to countries that are fast-tracking CBDC developments but have relatively high-capacity constraints or weak regulatory standards. The IMF will also give priority to answering the most pressing and frequently asked questions.

10. The IMF will collaborate with other international organizations in delivering CD. Other institutions also work on CBDC, but with different focuses. The BIS, with 63 members, fosters collaboration on innovative financial technology and explores concrete solutions involving CBDC (BIS 2018), but does not directly serve a majority of the EMDEs, including through CD. The World Bank has an active CD program to aid its members to achieve their developmental goals and provides a decision-making framework about CBDC from the perspective of payment systems and services (World Bank 2021). The IMF will join hands with these institutions in providing CD in particular by drawing on their expertise. The IMF will also collaborate with standard setting bodies on the development of policy views on which CD is based and will ensure consistency of CBDC CD with the relevant international standards. The IMF is dedicated to complementing the work of other organizations, while delivering on its mandate and avoiding duplication of work.

11. A concrete example of IMF collaboration with other international organizations is the provision of CD to enhance cross-border payments. To help achieve the targets of the G20 roadmap to enhance cross-border payments, the G20 has tasked the IMF and the World Bank, in close collaboration with the Committee on Payments and Market Infrastructures (CPMI) and the Financial

³ For example, the analysis of the potential macrofinancial implications of CBDC will increasingly need to be quantified based on country circumstances, such as the structure of the banking system and the monetary policy environment. Such quantification would likely involve different techniques, for example, model simulation, as actual empirical data are not readily available.

Stability Board (FSB), to jointly develop a technical assistance program. As CBDC can potentially provide a new way to conduct cross-border payments with large efficiency gains, factoring an international dimension into CBDC design will be an important component of the roadmap. In addition, the technical assistance program will help address other frictions in cross-border payments. Developing such a program will involve conducting outreach to countries alongside the World Bank, BIS, CPMI, and FSB, developing materials where opportunities to support cross-border payments have been identified, establishing a roster of cross-border payments experts and undertaking technical assistance missions. When collaborating with other institutions, the IMF is ultimately responsible and accountable to the IMF Executive Board, as elaborated in the section below on “governance.”

WHAT QUESTIONS DO AUTHORITIES HAVE ON CBDC?

12. Questions related to CBDC vary depending on country circumstances and familiarity with CBDC. While many countries have only begun their exploration of the topic, some are already considering CBDC design. And a few countries are exploring proof of assumptions (PoA) and pilots with a view to a potential issuance of CBDCs.⁴ Meanwhile, most countries are conducting analytical work, for instance, to investigate the macrofinancial implications. Authorities’ questions can be categorized into four groups. The first three groups of questions are building blocks, and the fourth group includes important policy issues that must be carefully considered before implementation. These categorizations are imperfect, however, as questions across groups are related to each other and new questions are constantly evolving as technology and experience evolve.

13. The first group of questions is about exploration. Examples include: What are the policy objectives of CBDC and alternative payment instruments? What are the use cases? What are the pros, cons, and risks of CBDC? What lessons are other countries learning? What are the frameworks, methodologies, and toolkits to guide countries to make decisions? What are the pros and cons of cross-border use of CBDCs? What are the necessary infrastructures and institutions required to issue CBDCs? What are the implementation costs of CBDCs? What are potential adoption levels?

14. The second group of questions is about design options. Examples include: How do design features (for example, tiered wallets and offline functionality) relate to the objectives pursued? What are the respective roles of the public and private sectors in designing and implementing a CBDC? What are the approaches to data management? What incentives are necessary to encourage intermediaries to participate in CBDC arrangements and to ensure cost recovery? How to encourage adoption by merchants and consumers? Which technologies are relevant and what are their pros and cons? How would a central bank ensure cybersecurity? How can an environmentally friendly CBDC be designed? Does the existing legal framework provide the necessary foundation for a robust CBDC issuance? Does the existing legal framework related to the central bank’s internal governance and risk management

⁴ The proof of assumptions phase of a CBDC exploration program validates or invalidates the assumptions and conditions for success identified during the preparation phase. It covers the policy questions as well as regulatory, technology, and adoption criteria.

allow for an adequate governance and risk management of the CBDC issuance? Which regulations and laws need to be in place to support CBDC and contain risks?

15. The third group of questions is about project management and organization. Examples include: How to set up PoA and pilots? How can pilots be designed to test specific policy hypotheses? What granular data on payment market need to be collected to understand potential benefits risks and assess CBDC performance and adoption? What is the operational capacity of central banks and their partners? How to communicate with all stakeholders? What are the governance and risk management arrangements as well as implementation considerations?

16. The fourth group of questions is about macrofinancial implications of CBDC. Examples include: What are the implications for monetary policy transmission and operation, financial stability, the role and stability of banks, market structure and contestability, capital flows and capital flow management considerations, and external stability? What are the implications for cross-border payments and how to achieve interoperability with other CBDCs? Importantly, how could CBDC be designed—and how could it leverage multilateral payment platforms—to strengthen the stability and efficiency of the IMS? What are the roles of CBDC in promoting financial inclusion? How do data management practices affect market structure and private sector involvement?

OVERVIEW OF THE CBDC HANDBOOK

A. What Is the Handbook?

17. The CBDC Handbook is intended to be a reference to help countries get up to speed, serve as a basis for CD delivery, and provide a focal point for analytical work. Multiple IMF departments with different expertise on CBDC will collaborate on the project, and input and experience from country authorities will be widely sought. The intended audience is medium- to high-level policymakers in central banks and ministries of finance, and to some extent in other government agencies. The Handbook will also be written for IMF staff and experts who join CD missions. It does not constitute an endorsement of any CBDC issuance by the IMF, and the choice of issuing a CBDC remains with the authorities themselves. The reference will synthesize knowledge from a variety of sources, including IMF staff research published as Fintech Notes, Selected Issues Papers, and publications by other international organizations and academia.⁵ It will add value to the existing literature by presenting CBDC material in a way that addresses the practical needs of decision makers in central banks.

18. The Handbook will mostly be descriptive rather than prescriptive, offering information, experience, empirical findings, and frameworks to evaluate CBDC. Most statements and analysis will be conditional on countries having specific policy objectives. The Handbook will not recommend that countries adopt one objective over another. The Handbook will help central banks think through

⁵ Fintech Notes offer practical advice from IMF staff members to policymakers on important issues. The views expressed in Fintech Notes are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

and evaluate the decision of whether to issue a CBDC. It will enable tailored application and will relate concrete and tested messages of practical relevance to countries.

19. The CBDC Handbook chapters will be produced sequentially. The Handbook will be a “living” document, with four to five new chapters (from a total of about 20) added each year over four to five years and existing chapters updated as new experience emerges and policy views evolve. An initial wave of chapters will be published before the 2023 Annual Meetings. These chapters will be chosen on the following basis: (1) they provide a methodological framework for conducting CBDC exploration; (2) they address the most common requests that IMF staff encounter in CD engagement; and (3) they are based on relatively well-established knowledge and experiences of CBDC.

B. Why Put Together a Handbook Now?

20. The strong and widespread interest in CBDC has resulted in a rapidly increasing number of requests for IMF guidance from central banks around the world. As outlined earlier, the IMF has been actively providing assistance through bilateral CD and regional workshops. At the same time, IMF staff has been developing analytical work on the issues relevant for countries considering CBDC issuance. The Handbook, by encouraging the synergy between CD and analytical work, can be used to guide countries that are exploring CBDC and strengthen central banks’ capacity building in CBDC.

21. To help implement the digital money strategy, a new Monetary and Capital Markets (MCM) CD Strategy 2022-25 was also published in February 2022 (IMF 2022b).⁶ One key element of the strategy is for the IMF to maximize the impact of CD work by providing demand-driven CD tailored to individual country needs. Another is that the IMF provides highly specialized CD across key financial sector topics and works to continuously maintain up-to-date skills and develop new expertise to assist member countries in traditional and emerging growth areas.

22. CBDC represents a significant growth area in the CD strategy, which notes that requests for IMF advice are wide-ranging depending on domestic capacity and progress. CBDC CD projects are designed to adapt to these circumstances while never losing sight of the macrofinancial impacts of CBDC design, legal considerations, and regulatory frameworks. Identifying and answering countries’ analytical questions through the CBDC Handbook could not only help the authorities make well-informed decisions but also help clarify the IMF’s stance on CBDC issues. CBDC CD can help build capacity so countries can leverage macrofinancial benefits while containing risks, and indirectly benefit other countries by taking into account spillover effects and strengthening the IMS. The CBDC Handbook will therefore contribute to the overall MCM CD strategy, and enhance the synergy between bilateral CD and analytical work.

23. The CBDC Handbook as a “living” document will facilitate CD delivery as knowledge on CBDC evolves. CBDC is a new topic and experimentation is advancing quickly. By nature, waiting for all

⁶ One of the four core competencies the IMF offers is its unique ties to member countries through surveillance and capacity development (IMF 2021). Therefore, the CBDC CD and Handbook will underpin the implementation of the digital money strategy.

questions to be answered and best practices to be established before providing advice will not satisfy emerging country needs. The Handbook is thus designed to capture the existing body of knowledge and to update it regularly.

C. How Will the IMF Collaborate with Member Countries and Other International Organizations?

24. The Handbook will facilitate the IMF’s collaboration with other international organizations. For one, the Handbook will build on the work that began under the UK Presidency of the G7 and that yielded the *Public Policy Principles for Retail Central Bank Digital Currencies* (G7 2021). That report emphasizes the need for CBDCs to be grounded in transparency, rule of law, and sound economic governance while supporting the ability of central banks to fulfill their mandates for monetary and financial stability. Prior work by the BIS and selected advanced-economy central banks, *Central Bank Digital Currencies: Foundational Principles and Core Features* (BIS 2020), is also relevant.

25. The Handbook will also facilitate the IMF’s collaboration with member countries. The ongoing bilateral CD, regional workshops, and Handbook will reinforce and enrich each other. Member countries have studied CBDC extensively and valuable experience can be drawn. This experience will guide the development of the Handbook, with fieldwork essential to refining and tailoring analytical results. Ultimately, lessons and results that are sufficiently general will be extracted and published in the Handbook to build the analytical backbone for further CD. As discussed in the later section on governance, extensive consultation on the Handbook chapters will facilitate broad buy-in and the sharing of important lessons. The CBDC Handbook will build on existing global initiatives, encourage international cooperation, and help extract common practices.⁷

D. Who Will Fund the Handbook?

26. The Government of Japan is a major partner and donor to fund the Handbook. The purpose of this Japan subaccount (JSA) CBDC Funding Program is to support country authorities’ CBDC initiatives with CD, outreach and knowledge sharing with a focus on EMDEs, and specifically the analytical underpinnings, with the Handbook being the major output. The Handbook’s ultimate objective is to strengthen central banks’ capacity in CBDC to avoid a digital divide. The CBDC Handbook is envisaged to be a key component in achieving this aim.⁸

⁷ The CBDC Handbook chapters will build on existing global policies and initiatives. For instance, the chapter on data use and privacy protection will be aligned with the G20 Data Gaps Initiative, which includes the development of a data collection framework for CBDC.

⁸ Funding has been provided under two windows: (1) JSA funding under the COVID-19 Window. JSA funding (\$1.3 million) supports CD and analytical work from December 2021 to April 2023. (2) JSA funding under the new Digital Money Window. JSA funding (\$10.4 million) supports CD and analytical work from November 2022 to April 2025. Coverage of AML/CFT and broader financial integrity issues is funded by the multi-donor Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) Thematic Fund (to which Japan also contributes).

THEMATIC AREAS OF THE CBDC HANDBOOK

27. The Handbook chapters will be grouped in the following subject areas (Annex 1):

A. Objectives and Framework

28. **The first chapter will “position” CBDC.** This chapter will introduce CBDC conceptually and differentiate it from alternative payment instruments, including fast payments and e-money. It will explore whether CBDC is superior to alternatives and discuss the reasons to consider CBDC if other digital means of payment have been widely adopted. In addition, the chapter will look ahead to the role of CBDC in supporting a broader digitalization of the economy.

29. **The second chapter will identify pain points and objectives.** This chapter will examine the pain points and policy drivers related to payment and financial systems in member countries (see Box 2 for an example on addressing pain points). It will evaluate how CBDC can address the gaps in the existing payment systems. The chapter will also discuss various objectives, such as promoting digitalization and financial inclusion, improving efficiency, ensuring resilience, reducing illicit use of money, fostering competition, and securing monetary sovereignty.

Box 2. CBDC CD to the Banco Central de Reserva del Perú

Leapfrogging through CBDC

The Banco Central de Reserva del Perú (BCRP) has a vision for all citizens to have safe, convenient, and efficient access to digital payments. Even though numerous digital payment systems do exist, uptake is low, and nearly half the population is still unbanked. The main challenges lie both on the demand and supply sides. Demand side factors include high informality, low levels of financial literacy, and distrust in the financial system. On the supply side, there are limited mobile and internet coverage penetration and access points in rural areas. Lack of competition has also led to high fees for merchants and a lack of interoperability between retail payment instruments. In combination, these significant and complex issues kept the dependence on and stickiness to cash.

With the emergence of CBDC, the BCRP sees the opportunity to provide a platform built as a public good, without dependency on legacy systems, to address the digital divide. Authorities turned to the IMF for assistance. The main goal was to strengthen their capacity to assess the feasibility of CBDC.

Challenging Underlying Assumptions: A “Design Thinking” Approach

The IMF mission deployed a “design thinking” approach—stepping back, asking tough questions, and openly challenging underlying assumptions. Through this process, some of the reasons for the reliance on cash by different stakeholders were assessed. The BCRP agreed that the voice of the stakeholders needed to be heard even more and requested that the mission engage with various stakeholders to further deepen understanding of root causes of pain points.

Box 2. CBDC CD to the Banco Central de Reserva del Perú (concluded)

Learning from Stakeholders

Two parallel research studies investigated stakeholders' perspectives on the current state of the environment and gathered insights into stakeholders' daily payments experience and behaviors. In the first study, 29 top-level leaders of 21 financial institutions and regulators were interviewed. In parallel, 27 citizens, from both rural and urban areas, were interviewed. The findings highlighted motivational, capacity, and behavioral factors that may inhibit the adoption of digital payment instruments.

Proceeding Steadily: Developing a Clear Roadmap, a White Paper, and an Innovation Challenge

A scoping mission with the BCRP during 2022 helped develop a roadmap for CBDC exploration. The mission team advised the BCRP not to rush and adopt an iterative, phased approach. The BCRP was encouraged to draft a white paper about the problems identified during the first mission. Further, the BCRP requested assistance to develop capacity to design and execute an innovation challenge. A follow-up mission has produced an operating manual to assist the BCRP in better understanding the requirements, resources, and process for designing and executing an innovation challenge. The challenge will help the BCRP assess how their main payment system policy challenges may be addressed.

30. The third chapter will consider a framework to guide countries through the process of evaluating CBDC. This chapter will depict the key elements that policymakers need to consider in order to make well-informed decisions on whether and how to issue CBDCs. It will discuss a high-level CBDC decision-making process and describe how a detailed feasibility study can be organized. The chapter will also provide a thinking-through process by covering potential policy objectives, foundational capacity of the central bank, risk and impact considerations, design choices, technology experimentation and implementation, project management, as well as legal foundations, regulation, and supervision. Moreover, it will examine the interconnections among different elements to ensure adoption and mitigate risks.

B. Foundational Requirements and Readiness

31. The fourth chapter will analyze the legal foundation needed for the issuance of a CBDC.

Countries ask whether their existing legal framework provides them with the adequate foundation for a robust CBDC issuance and, if not, when should they bring the necessary amendments. A robust CBDC issuance needs to have a solid foundation in both public and private law. Without it, the CBDC issued would lack the legal certainty it needs to be trusted. Further, such legal foundation must exist before CBDC issuance. Central banks must also assess the potential financial integrity risks and develop the necessary mitigating measures.

32. The fifth chapter will discuss central bank cyber readiness and resilience. This chapter will highlight best practices to build a secure and resilient CBDC ecosystem. In addition, the chapter will discuss how to strengthen cyber resilience through the internal organization of the central bank and central bank governance that is provided for and governed by existing central bank laws (such as a decision-making process, accountability, and committees).

33. The sixth chapter will examine capacity within central banks. This chapter will relate experiences from central banks in setting up teams and building internal capacity to evaluate CBDC projects. It will cover design of institutions, points of inflection when teams typically grow, the decision to build in-house through hiring or acquiring resources versus outsourcing, and the skillset useful at each stage of CBDC evaluation. The chapter will discuss the potential risks for the central bank and the capacities the central bank needs to assess and mitigate these risks. The chapter will also identify the features of a robust governance and risk management framework for the evaluation and deployment of CBDC.

34. The seventh chapter will focus on addressing new challenges to regulation and supervision. This chapter will cover effective oversight and supervision of CBDC to ensure compliance with the CPSS-IOSCO Principles for Financial Market Infrastructures (PFMI) as well as international standards applying to service providers, depending on CBDC design. The chapter will also discuss how to develop, implement, and communicate oversight and supervision policies. It will review institutional designs to support oversight and supervision while keeping these separate from operational functions. In addition, the chapter will discuss the legal framework relevant to financial intermediaries involved in the issuance, distribution, and holding of CBDC as well as the interaction between CBDC and payments laws. Also, the chapter will cover the legal amendments needed to strengthen supervision and regulation and financial integrity.

C. Design Process, Considerations, and Choices

35. The eighth chapter will look at how design choices affect policy objectives and risk management. This chapter will identify design choices, such as operating model, limits in holding, programmability, interest bearing, and degree of centralization. It will then map these design choices into CBDC objectives and risks and identify apparent tradeoffs. For instance, tiered wallets protect privacy but risk undermining financial integrity or capital flow management measures (CFMs); or limits on CBDC balances to mitigate disintermediation risk might discourage the adoption of CBDCs.

36. The ninth chapter will delve into business models and adoption. This chapter will clarify how the public sector can incentivize the private sector, such as banks, nonbank payment service providers, and technology vendors, to provide CBDC services. Access to transactions data will likely play a key role. The chapter will identify CBDC features and related programs that affect CBDC adoption, such as subsidies or communication strategies. Finally, it will examine the costs of CBDC development and maintenance.

37. The tenth chapter will cover the financial integrity risks associated with CBDC issuance. Different design choices will have an impact on a country's anti-money laundering and combating the financing of terrorism (AML/CFT) regime and its implementation. Further, as with other forms of money, CBDCs may pose money laundering and terrorism financing (ML/TF) risks. This chapter will analyze the financial integrity implications and ML/TF risks related to various CBDC design features. It will discuss whether the central bank or the CBDC service providers will be responsible for mitigating financial integrity risks. Jurisdictions should conduct an ML/TF risk assessment prior to launching CBDC. This

chapter will explain that they may need to update their AML/CFT frameworks, ensure that relevant actors in a CBDC ecosystem are regulated and subject to AML/CFT obligations and oversight, ensure that AML/CFT requirements are properly implemented in a CBDC context, and ensure that law enforcement bodies are able to investigate and prosecute offenses involving CBDC, or generating criminal proceeds in CBDCs, and seize, freeze, or confiscate such proceeds.

38. The eleventh chapter will consider the tradeoff between data use and privacy protection.

This chapter will first discuss what data are generated by CBDC transactions and which institutions might have access to it. It will then observe the risks arising from accessing and storing data. Then the chapter will investigate the tradeoff between data use and privacy protection, with a focus on macrofinancial implications, such as on market structure and contestability. In addition, the chapter will discuss how privacy-enhancing technologies can shift this tradeoff, unlocking greater economic value of data while maintaining privacy. How countries manage this tradeoff will depend on country-specific circumstances and domestic considerations.

39. The twelfth chapter will consider how CBDC can facilitate (or undermine) the implementation of CFMs. This chapter will be split into two parts, one focused on designing CBDC to support CFMs and the other on adapting CFMs to foreign CBDCs. The chapter will concentrate on programming CFMs into CBDCs or into the platforms used to exchange CBDCs across borders.⁹

D. Project Approaches and Technology

40. The thirteenth chapter will consider how to implement a robust CBDC project management process that is in line with the decision-making framework. This chapter will explore the five steps to project management: (1) preparation (scoping, defining success criteria, feasibility, assessing capacity and risks); (2) PoA (assumptions validation); (3) prototypes (technologies and partners selection); (4) pilots (real production situation); and (5) production (final issuance and operation). The chapter will describe the objectives, stakeholders, methodology, and options to properly run PoA, prototypes, and pilots, exploiting data on CBDC use in the pilot to shed light on adoption, risks, and new opportunities (see Box 3 for an example on pilots). The chapter will also discuss legal considerations, specifically in terms of distribution of legal responsibilities and liabilities between central banks and technology vendors; outsourcing rights; and obligations. In addition, it will provide an evaluation methodology of a CBDC project and a final pre-launch checklist that covers risk management and cybersecurity readiness, including a business continuity plan.

⁹ The exploration of design CBDC systems to facilitate compliance with CFMs will build on existing policy discussions, such as the revised institutional view on the liberalization and management of capital flows (IMF 2022c).

Box. 3 CBDC CD to the Bangko Sentral ng Pilipinas

Piloting a Wholesale CBDC

The Philippine central bank— Bangko Sentral ng Pilipinas (BSP)—has made significant progress in preparing to pilot a wholesale Central Bank Digital Currency (wCBDC) under the umbrella of Project CBDCPh. This is an offshoot of the BSP’s study of the use cases for a CBDC to potentially address the pain points of the national payment system, namely the enhancement of cross-border payments, settlement of equity transactions in central bank money, and the automation of intraday liquidity management. The Project aims to first build the necessary capacity within the BSP and in its supervised financial institutions by allowing them to gain hands-on knowledge of a wCBDC system. It focuses on domestic fund transfers among a limited number of financial institutions, the learnings of which shall serve as inputs in drafting a roadmap for pursuing future CBDC projects aimed to further enhance the national payment system.

IMF’s Proactive Engagements

An IMF mission conducted a virtual engagement where the mission team provided the BSP with relevant training sessions and workshops, covering the legal and macrofinancial implications, as well as technology and design considerations of a CBDC. The virtual engagement also included feedback and comments on the features and specifications of the prototype under Project CBDCPh. The IMF team subsequently conducted a field mission to help authorities assess the value proposition and use cases of a possible wCBDC in the Philippines.

Involving Stakeholders Early

Industry consultation is key. Market participants are enthusiastic about the project and wCBDC’s potential to spur further development of the Philippine payments system and financial markets. Participants were uniformly appreciative of the efforts the BSP is undertaking to stay at the cutting edge of payments system development. The pain points most acutely felt by market participants are in the areas of debt securities settlements and cross-border payments. Testing interbank payments, the use of wCBDC in settling tokenized securities transactions and cross-border payments involving a Peso wCBDC and a foreign wCBDC platform look like strong candidates for future exploration and testing.

41. The fourteenth chapter will provide a review of the technology landscape, CBDC technology “stack,” and how to deal with vendors. The chapter on “Technology Landscape and Innovation” will discuss the relevant technologies and digital infrastructure for CBDC and the role technology can play in achieving objectives. It will explain ways to explore relevant technologies (such as labs, PoA, hackathons, call for tender) and include considerations about fostering innovation. The chapter will also explain how to approach typical technical questions, such as (1) distributed ledger technology (DLT) and non-DLT; (2) offline access; (3) programmability; and (4) resilience.

E. Potential Macrofinancial Implications

42. The fifteenth chapter will focus on CBDC’s role in promoting financial inclusion. Many central banks’ stated policy goal is improved financial inclusion, especially in emerging market and low-income economies. CBDC may improve financial inclusion, including by enhancing cross-border payments. However, CBDC may also face limitations and can undermine financial inclusion. This chapter will discuss these potential effects and identify the design features most prone to improving inclusion. The chapter will end by reviewing complementary strategies to target the unbanked.

43. The sixteenth chapter will cover the potential implications of CBDC for monetary policy transmission in different monetary policy regimes. Most countries are investigating the implications of CBDC for monetary policy transmission, depending on economic environments, design choices, and monetary policy regime. This chapter will analyze the likely impact of CBDC on several channels of monetary policy transmission (for example, the interest rate, credit, exchange rate, and asset price channels) and according to the three predominant monetary policy regimes of the world: (1) inflation targeting; (2) exchange rate targeting; and (3) monetary aggregate targeting.

44. The seventeenth chapter will provide a framework and analytical tools for appraising the impact of CBDC on bank disintermediation and financial stability. This chapter will investigate financial stability issues, such as the impact on bank runs, bank funding costs and structure, and currency runs. The chapter will also discuss how policymakers should anticipate potential issues for financial stability and make design choices that can help safeguard the functioning of the financial system.

45. The eighteenth chapter will consider the opportunities and risks associated with cross-border use of CBDC and potential designs for cross-border payments. Work on CBDC is increasingly driven by ways to improve cross-border payments efficiency. The chapter will begin by considering models to leverage CBDC to increase the speed, transparency, and accessibility of cross-border payments and reduce their costs. The chapter will then consider implications for the level and volatility of capital flows. It will also support the IMF's (and the World Bank's) mandate to provide technical assistance on leveraging CBDC to enhance cross-border payments per Building Block 19 of the G20 Roadmap (FSB 2020).

46. The nineteenth chapter will discuss the impact of CBDC on the financial sector's market structure and contestability, as well as the role of banks and nonbanks. This chapter will explore how CBDC could compete with different existing forms of payment instruments: from cash and commercial bank deposits to e-money and cryptocurrencies. The chapter will draw on specific country experiences and investigate how the introduction of a CBDC could potentially increase contestability in the payments system.¹⁰

GOVERNANCE

47. The CBDC Handbook chapters will be limited to topics within the IMF's mandate. The IMF has a mandate to ensure that widespread adoption of digital money fosters domestic and international economic and financial stability. The CBDC Handbook chapters will also underpin the implementation of the digital money strategy (IMF 2021).

48. The development of the Handbook will follow a three-part process to ensure broad buy-in and a comprehensive rendering of country experiences and lessons. First, staff will develop a Fintech Note for each chapter and seek comments from within and outside the IMF. Consultation

¹⁰ Implications for fiscal policy will be studied in a separate book prepared by the Fiscal Affairs Department at the IMF.

on the Fintech Notes with external parties—policymakers, academicians, and members of other international institutions—will take place through presentations at conferences and seminars, as well as through comments on drafts.

49. Second, staff will brief the IMF Executive Board on key policy messages stemming from the Fintech Notes. Not all Fintech Notes will relay new policy messages, though some will—such as Fintech Notes on monetary policy and financial stability. Once a sufficient number of Fintech Notes with new policy messages has been published, staff will brief the IMF Executive Board on those messages to seek high-level feedback and support.

50. Finally, new Handbook chapters will be published each year around the time of the Annual Meetings. Chapters will build on the Fintech Notes and be labeled as such and added to the online CBDC Handbook. Outreach will ensure that countries are informed of new chapters as they are released. In addition, existing chapters will be updated as knowledge and experience build.

CONCLUSIONS

51. The global interest in CBDC is unprecedented, with exploration taking place around the world. Yet, there exist few real-world examples of CBDCs to learn from. IMF member countries are looking for answers and lessons from other members.

52. This is reflected in the sharp increase in demand from member countries for CBDC CD. Through bilateral CD and regional workshops, IMF staff are developing a solid analytical and practical understanding of the issues that are relevant for countries considering CBDC issuance. Having collected questions through various missions, the IMF, with its global membership, is in a prime position to assist policymakers contemplating CBDC and strengthen central banks' capacity building in CBDC.

53. This paper sets out a plan to develop the CBDC Handbook to address the issues that are most important for countries to tackle. In doing so, it aims to focus the attention of policymakers on and foster convergence around an analytical and implementation agenda for CBDC. The IMF staff intends to pursue this agenda and draw on insights from policymakers, academicians, and other international organizations. Emerging knowledge and experiences will be collated as chapters of a CBDC Handbook, which will serve as the basis of IMF CBDC CD engagement.

54. The Handbook is a substantial and dynamic undertaking—about 20 chapters are envisaged over the next four to five years, with four to five chapters produced per year. The Handbook will be a “living” document, with published chapters updated and new chapters added as new experiences emerge and policy views evolve. Ultimately, IMF CBDC CD will help countries make as well-informed decisions as possible when taking the major step to design and issue their own CBDC.

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