

CBDCs in emerging market economies

1. Introduction: the Central Bank of the United Arab Emirates (CBUAE) in the global CBDC environment

Currently, 86% of central banks are exploring CBDC use cases. Based on our recent research, there are 76 existing CBDCs from 67 jurisdictions around the world who are involved in the CBDC exploration journey. Within these 76 CBDCs, there are 11 consortiums, and CBUAE is proud to be involved in two of these, namely the “Aber” project and the “mBridge” or Multiple CBDC Bridge project.

The “Aber” project was a CBDC project jointly conducted by CBUAE and the Saudi Central Bank (SAMA) as an innovative initiative which was considered one of the first of its kind internationally at the level of central banks. This initiative aimed to provide a proof of concept to study, understand and evaluate the feasibility of a digital currency being issued jointly by central banks (wholesale CBDC) with a view to developing cross-border payment platforms and reducing transfer times and costs between banks, as well as experimenting with the use of technologies such as distributed ledgers. The wholesale CBDC was fully covered and issued by CBUAE and SAMA and was only used by the two central banks and the banks participating in the initiative, as a settlement unit for domestic as well as cross-border payment transactions between the United Arab Emirates (UAE) and Saudi Arabia. A final report was issued on 29 November 2020.¹ We were also honoured to be awarded the 2021 Global Impact Award for this first-of-its-kind cross-border payment initiative in June 2021.²

The “mBridge” project is for international payments and involves collaboration among a number of central banks, including the BIS Innovation Hub (BISIH) Centre in Hong Kong SAR, CBUAE, the Hong Kong Monetary Authority (HKMA), the Bank of Thailand (BOT), and the Digital Currency Institute of the People’s Bank of China (PBoC). The early results of the mBridge prototype indicated substantial improvements in cross-border funds transfers from an average of three to five days to near real-time cross-border payment.³ In addition, the potential to reduce several of the core cost components of correspondent banking⁴ was identified. The project at present involves 22 private sector participants. A report was published to explore 15 potential use cases during Hong Kong Fintech Week, a global event held from 1–5 November 2021 in Hong Kong SAR. The mBridge project is currently progressing in a satisfactory manner, and CBUAE looks forward to continuing close collaboration with the BISIH and peer central banks, with the mutual objective to deliver better,

¹ See CBUAE and SAMA, “CBUAE and SAMA issue report on results of joint digital currency project “Aber””, 29 November 2020, www.centralbank.ae/sites/default/files/2020-11/CBUAE_and_SAMA_Issue_Report_on_Results_of_Joint_Digital_Currency_Project_Aber_EN.pdf.

² See CBUAE, “CBUAE and SAMA awarded the 2021 Global Impact Award for their first-of-its-kind cross-border payment initiative Project Aber”, 16 June 2021, www.centralbank.ae/sites/default/files/2021-06/CBUAE_Global_Impact_Award_Project_Aber_Press_Release_EN.pdf.

³ Near real-time is defined as less than 10 seconds.

⁴ See BIS Innovation Hub, Inthanon-LionRock to mBridge: building a multi CBDC platform for international payments, September 2021, www.bis.org/publ/othp40.pdf.

faster, safer and more cost-effective means of international funds transfers. CBUAE would like to take the chance to express our appreciation to the BISIH and peer central banks for the project's ongoing robust progress through successful collaboration and strong teamwork in the consortium.

2. Main objectives of introducing CBDCs

The main objectives of our participation in the mBridge project are to create more efficient and innovative infrastructure to reduce obstacles and address the pain points of cross-border payments, including high costs, lack of transparency, low efficiency and other operational complexities.

Currently the global nature of Covid-19 and its impact on e-commerce continues to encourage the strengthening of international collaboration and further development of policies for online purchases and supply.⁵ On the other hand, the global digital payment market is also growing, and expected to grow through 2023 at the rate of 20%.⁶ It is important for CBUAE and other central banks to explore potential solutions for a more resilient payment infrastructure that allows both individuals and businesses to make fast, yet efficient and reliable payments, and at the same time to benefit from an innovative, competitive and inclusive payment system.⁷ CBDC provides a potential solution which can be built alongside other existing payment systems, eg real-time gross settlement (RTGS) and private sector initiatives, to continue enabling and supporting the private sector to create choices for markets.⁸ Most importantly, while CBDC can be a building block for more resilient and efficient cross-border payment, it should be carefully regulated to allow more secure and trustworthy means of payment services for individuals and businesses.

It is also crucial to note that any CBDCs would also have important public policy implications, including for monetary policy and financial stability, legal and governance frameworks, and data privacy, operational resilience and cyber security.⁹

CBUAE is well aware of the many benefits that both retail and wholesale CBDC can bring to the table. Retail CBDC will essentially establish a direct connection with consumers; it has the potential to minimise effort and processes for governmental and commercial activities.¹⁰ Wholesale CBDC will have the potential to create a faster and more secure payment and settlement system across different local and international banks, as well as directly linking securities, FX features, settlement on

⁵ See www.businesswire.com/news/home/20210604005270/en/Digital-Payments-Market-Report-2021-Transaction-Value-was-5.44-Trillion-in-2020---Global-Growth-Trends-COVID-19-Impact-and-Forecasts-2021-2026---ResearchAndMarkets.com.

⁶ See The Business Research Company, "Increasingly being used to curb the spread of Covid-19, digital payments market to reach a whopping \$5.4 trillion in 2020!", 7 May 2020, www.thebusinessresearchcompany.com/press-release/digital-payments-market-size.

⁷ See Bank of England, "Central Bank Digital Currency: opportunities, challenges and design", Discussion Paper, March 2020, www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper.

⁸ Ibid.

⁹ See Group of Seven, *Public policy principles for retail central bank digital currencies*, October 2021, www.mof.go.jp/english/policy/international_policy/convention/g7/g7_20211013_2.pdf.

¹⁰ See "CBDCs: A Monetary Highway to Hell", www.hustleescape.com/cbdc-advantages-disadvantages/.

OTC markets, etc, while syndicated lending and trade finance could also experience enhanced speed.¹¹

3. Guiding principles of CBDC design and data governance

Given policy objectives, should a retail CBDC architecture be “intermediated”, “hybrid” or direct? How should competition among payment service providers (PSPs) factor into design considerations?

CBUAE envisions a retail CBDC model to be an “intermediated” architecture in a two-tier distribution model, where detailed retail transactions and balances are maintained at the intermediary level (banks and PSPs), and the central bank maintains only the wholesale payments of individual intermediaries. Since there is quite a significant decoupling between the wholesale and retail ledgers in this architecture, the detailed records of retail transactions and balances are maintained by the respective intermediaries,^{12,13} the principle to segregate exists and may ease the operational burdens on central banks, which also lowers the responsibility to safeguard user data and provide better cyber resilience.¹⁴ The two-tier distribution model has substantial benefits over a single-tier system as it allows central banks and private sectors to work in a complementary way, each doing what they do best, eg the central bank providing stability and guarantee of value while the private sector executes consumer-facing services and is responsible for innovation, maintaining the accuracy of the retail balances, and handling various complex and paperwork-intensive operational processes such as know-your-customer (KYC) and anti-money laundering (AML).¹⁵

In terms of PSPs, it is worth noting that the UAE has an increasingly digitally savvy population, with smartphone penetration reaching 80–90% in leading markets, while at the same time consumer digital payment transactions have grown at an annual rate of around 10%, and are currently accelerating further due to the pandemic, which is shifting consumers more towards contactless payments. In addition to the issuance of four payment regulations by CBUAE to facilitate payment industry innovation and development (the Stored Value Facilities (SVF) Regulation,¹⁶ the Large-value Payment Systems Regulation, the Retail Payment Systems Regulation, and the Retail Payment Services and Card Schemes Regulation), there has also been a recent rise of fintech

¹¹ See Finextra, “Towards a central bank digital currency: retail versus wholesale”, 26 July 2019, www.finextra.com/blogposting/17556/towards-a-central-bank-digital-currency-retail-versus-wholesale.

¹² See R Auer R and R Böhme, “Central bank digital currency: the quest for minimally invasive technology”, *BIS Working Papers*, no 984, June 2021.

¹³ See Bank for International Settlements, “CBDCs: an opportunity for the monetary system”, *Annual Economic Report 2021*, June 2021, pp 65–95.

¹⁴ See Hong Kong Monetary Authority, *e-HKD: A technical perspective*, October 2021, www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKD_A_technical_perspective.pdf.

¹⁵ Ibid.

¹⁶ See Simmons & Simmons, “New UAE regulations for payments providers and card scheme operators”, 29 July 2021, www.simmons-simmons.com/en/publications/ckroryt8u176h0a53deo3qbrx/licensing-scheme-for-uae-payments-providers-and-card-scheme-operators.

companies aiming to provide more niche financial services such as digital KYC services to prevent financial crime. Having identified this active and competitive environment in the UAE, the “intermediated” architecture caters for a more inclusive ecosystem with the PSPs, allowing opportunities for growth and innovations in the fintech space as well as the private sector.

How would CBDC (public money) coexist with commercial bank money (private money) as well as electronic money (eg stored value, liability of a regulated non-bank payment company, such as stablecoins)? What would be the regulatory framework for these three categories of money?

In contrast to CBDC (defined in section 1), commercial bank money is described as the portion of a currency which is made of book money – debt generated by commercial banks – and poses as a liability to the commercial bank, such as loans, certificates of deposit and savings accounts.¹⁷ In recent years, various forms of money have emerged which exist purely in computer systems or distributed ledgers, such as payment tokens (which typically use decentralised control as opposed to a CBDC¹⁸) and stablecoins (a digital asset designed to maintain a stable value relative to a national currency or other reference assets¹⁹).

In Section 2, we mentioned the importance of enabling a competitive and inclusive payment system that is able to meet payment needs and foster market growth.²⁰ However, central banks also need to ensure adequate consumer protection and prevent undesirable impacts on monetary policy and financial stability, and proper regulations on such development would be important.²¹ While CBDCs will be issued and regulated by central banks when launched, all other forms of money should also be subject to proper regulatory oversight, depending on their classification as assets, securities, or even money market funds.²² A balance would need to be struck between encouraging diversity and competition within the ecosystem, and maintaining sufficient regulatory standards for private service providers.²³

How can CBDCs be designed to protect consumers’ data and privacy? For example, who can access which parts of payments data and under what circumstance?

Supporting privacy could be a key motivation for CBDC issuance,²⁴ given that in the “intermediated” architecture in the two-tier distribution model mentioned earlier

¹⁷ See www.moneyland.ch/en/commercial-bank-money-definition.

¹⁸ See <https://en.wikipedia.org/wiki/Cryptocurrency>.

¹⁹ See C Waller, “Reflections on stablecoins and payments innovations”, remarks at “Planning for surprises, learning from crises” 2021 Financial Stability Conference, Cleveland, 17 November 2021.

²⁰ See Bank of England, “Central Bank Digital Currency: opportunities, challenges and design”, Discussion Paper, March 2020, www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper.

²¹ See I De Bode, M Higginson and M Niederkorn, “CBDC and stablecoins: Early coexistence on an uncertain road”, 11 October 2021, www.mckinsey.com/industries/financial-services/our-insights/cbdc-and-stablecoins-early-coexistence-on-an-uncertain-road.

²² Ibid.

²³ See Group of central banks, Central bank digital currencies: foundational principles and core features, October 2020, www.bis.org/publ/othp33.pdf.

²⁴ See Group of central banks, Central bank digital currencies: system design and interoperability, September 2021, www.bis.org/publ/othp42_system_design.pdf.

in Section 3, detailed retail transactions and balances are maintained by intermediaries (banks and PSPs) only, and consumer data privacy is therefore expected to be the responsibility of the intermediaries.²⁵

Various key principles such as adequate privacy design should be embedded into the CBDC from early on, followed with privacy regulations/policies/rules that should be clearly defined and regulated.

How to avoid dominance of big tech and the possibility of “walled gardens” in the domestic payment system?

Digital currencies issued by big tech companies are vulnerable to credit risk (ie default by the issuing company) and cash-out risk due to their need to emulate the properties of money.²⁶ This risk can be mitigated if central banks can design a more balanced CBDC and payment regulations that encourage diversity and competition within the ecosystem, while maintaining sufficient regulatory standards for private service providers.²⁷

Is an interoperable CBDC system envisaged? What are your main concerns when making systems interoperable? What is the scope for public and private partnerships in CBDCs?

CBUAE envisages an interoperable system domestically. In this regard, major challenges to note include achieving compatible standards across various systems, and achieving a single agreed framework between different policies and regulations as well as between the public and private sector. This is especially relevant in the case of a retail CBDC, where distribution of funds often relies on private sector companies which are closer to day-to-day needs of consumers, such as fintech companies.

4. Cross-border aspects of CBDCs

Will cross-border use of CBDCs lower costs involved in cross-border payments, including remittances? How large are risks for digital dollarisation in EMEs or capital market integration? How would you weigh the trade-offs between improved efficiency with CBDCs and the possibility for currency substitution?

Cross-border payments have been known to be prone to various frictions such as fragmented and truncated data formats across regions, complex processing of compliance checks, and limited operating hours across jurisdictions, which incur substantial cost for parties. This includes major issues such as high fees due to multiple intermediaries (correspondent banking) and a lack of guarantee as to whether funds have been received in full (ie finality).²⁸ CBDCs aim to simplify the intermediation chains and increase availability (as they would operate on a 24/7 basis) by starting a “clean state” system designed to achieve interoperability between

²⁵ Ibid.

²⁶ See “Walled gardens versus open markets in payments”, Financial Times, 30 June 2020, www.ft.com/content/75ae3ae0-c09f-4242-ab3e-f293d67d5c07.

²⁷ See Group of central banks, *Central bank digital currencies: foundational principles and core features*, October 2020, www.bis.org/publ/othp33.pdf.

²⁸ See Committee on Payments and Market Infrastructures (2021): *Central bank digital currencies for cross-border payments*, July, www.bis.org/publ/othp38.pdf.

different jurisdictions. The mBridge project is a good example for resolving these pain points.

While CBDCs improve efficiency, central banks should prioritise assessing their monetary risks before adopting one, through careful CBDC design. For instance, design choices that limit non-resident holdings and that require onboarding protocols for users and merchants might help counter the currency substitution risk. Additionally, tactical pricing mechanisms, such as placing higher fees on frequent cross-border transactions, could also reduce the scale of use, limiting the CBDC in circulation. Undoubtedly, decisions concerning this case would really depend on each jurisdiction's currency stability and monetary framework, and there may not be a "one size fits all" approach.