



## Payments System Research Briefing

# Observations from the Retail CBDCs of the Caribbean

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April 10, 2024

Three retail central bank digital currencies (rCBDCs) have been issued in the Caribbean, but thus far all have struggled to achieve expected adoption from both consumers and merchants. The efforts to launch these rCBDCs offer three takeaways: 1) the underlying technologies of rCBDCs may have little effect on adoption; 2) an rCBDC may need to demonstrate value added to entice consumers to use it; and 3) an rCBDC platform may need to be integrated into the larger financial ecosystem to be widely adopted.

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Three retail central bank digital currencies (rCBDCs) have launched in the Caribbean: the Bahamian Sand Dollar in 2020, DCash from the Eastern Caribbean Currency Union (ECCU) in 2021, and the Jamaican JAM-DEX in 2022. These rCBDCs were intended to shift cash-based economies to digital economies. However, the success of this shift requires both widespread adoption of the rCBDC by consumers and merchants and its use in everyday, low-value transactions.

A few years after launching, none of the Caribbean rCBDCs has yet achieved widespread adoption. The Central Bank of the Bahamas (CBOB), the Eastern Caribbean Central Bank (ECCB), and the Bank of Jamaica (BOJ) have each identified reasons for their rCBDC's low adoption. This *Payments System Research Briefing* examines and highlights observations from the ongoing efforts to facilitate adoption of rCBDCs in the Caribbean.

## Initial development and goals for Caribbean rCBDCs

Although each rCBDC was pursued for multiple reasons, the main goal of each product was to transform largely cash-based economies into digital economies. Expanding financial inclusion may have been a supplementary goal or benefit, but does not appear to have been the priority.

The first Caribbean rCBDC, the Bahamas' Sand Dollar, was an outgrowth of the Bahamian Payments Systems Modernization Initiative that began in 2003. The initiative established a real-time gross settlement (RTGS) system for large-value payments in 2004 and the automated clearinghouse (ACH) system for small-value retail payments in 2010. In 2017, the CBOB began considering a CBDC to give all Bahamians access to digital payments and banking services and reduce the size of the informal

(cash-based) economy (CBOB n.d.; Gutierrez and Marz 2022).

The second Caribbean rCBDC, DCash, entered development a couple of years later. In the ECCU, the ECCB started exploring the issuance of a CBDC in 2017, and work on the development of what would become DCash started in 2019. ECCB Governor Timothy Antoine suggested the bank was pursuing an rCBDC “to help reduce cash usage within the ECCU by 50 per cent [over five years], promote greater financial sector stability, and expedite the growth and development of our member countries.” He also noted, “It would be a game-changer for the way we do business” (ECCB 2019).

The third Caribbean rCBDC, JAM-DEX, followed closely behind. In Jamaica, the BOJ had been exploring the idea of an rCBDC since at least 2019 and decided to move forward with development in 2020. The rCBDC development was part of the BOJ’s ongoing reform of retail payments and transition to a digital economy (CBDCWG 2019; BOJ 2020; Jamaica Observer 2021). Specifically, the BOJ wanted consumers and businesses to be part of a “modern payment system, of a digital alternative to cash,” that would result “in systemic efficiency and significant reductions in costs for cash distribution and storage” for the BOJ and the financial system (Haynes 2021).

## Design and technology for rCBDCs

Unsurprisingly, the initial and often overriding concern of each rCBDC project was developing requisite technology. In each case, the central bank contracted with a technology firm to build its platform instead of developing it in-house. In the end, each of the three rCBDCs was built on a different technological foundation.

The technology firms all followed a vision for an intermediated, wallet-based rCBDC. In an intermediated CBDC model, the central bank performs all minting, burning, and settlement, and the authorized financial institutions that provide end users retail financial services are responsible for all contact and interaction with end users. A wallet-based CBDC means that transactions occur via smartphone-based apps or digital wallets. In some cases, the wallets were created by the CBDC developer. In all cases, detailed transaction data are only available to the financial institutions providing retail services.

The Sand Dollar runs on a private, permissioned distributed ledger technology (DLT) designed by NZIA Limited, now known as Movmint. Transactions are validated through a Proof of Work protocol. The CBOB does not receive any identifiable information in transactions, just the minimum data needed to perform settlement. Also, financial institutions providing Sand Dollar wallets are not allowed to retain any data beyond the account number of the user involved (CBDCWG 2020).<sup>1</sup>

The Sand Dollar wallet has an offline component that allows transactions (limited by total value) when connectivity with the CBDC ledger is lost.<sup>2</sup> The consumer wallet comes in two types based on the amount of know-your-customer (KYC) information

provided, with different total balance and monthly transaction limits. Tier 1 (the minimum KYC required) has balance and monthly transaction limits of B\$500 and B\$1,500, respectively, while Tier 2 has limits of B\$8,000 and B\$10,000.

DCash was built by Bitt on a private, permissioned blockchain using Hyperledger Fabric that resides on Google Cloud (Ledger Insights 2021). The ECCB can only view anonymized transaction data, which includes the type of transaction (such as person-to-person payments) and the amount of DCash stored in each digital wallet. Detailed data are only available to the financial institution hosting a user's digital wallet (IMF 2020).

DCash digital wallets were developed by Bitt and have no dedicated offline capability (Kiff 2021). Retail user wallets are divided into two types: registered and value-based. Anyone with an account at a participating financial institution can get a registered wallet; those without an account can sign up for a value-based wallet, which requires verified identification (ECCB 2020). Neither type of wallet has holding limits, but both types have monthly transaction limits. A registered wallet's transaction limit ranges from EC\$3,000 to EC\$20,000, while a value-based wallet's limit ranges from EC\$1,000 to EC\$2,700.

JAM-DEX was developed by eCurrency. Notably, the Jamaican CBDC is not built on a blockchain or a distributed ledger. Instead, a centralized ledger controlled by the BOJ handles "digital bearer instrument" tokens that move through Jamaica's RTGS system (Garratt and Shin 2023). eCurrency describes these tokens as "layers of cryptography that form a digital object that is secured independent of a ledger or wallet" (Cohen 2020). Because they are not dependent on the issuer's ledger for transactions, these digital objects can move through existing payment systems. JAM-DEX allows tokens to be transferred without any connection to the identity of the holder or need to communicate with the BOJ's ledger. Thus, transactions occur without the BOJ knowing the participants' identities. However, the bank can still gather aggregate data on transactions (Ciobanu 2021).

The only digital wallet available for JAM-DEX transactions is Lynk, which was developed by a subsidiary of the National Commercial Bank (Hall 2022). However, the wallet was not designed primarily to transact in JAM-DEX, but instead to move e-money in Jamaican dollars. The Lynk wallet appears to have no tiers or limits for JAM-DEX, but all Lynk users must pass National Commercial Bank's KYC to receive the wallet.

## **Low adoption of rCBDCs**

Although each rCBDC launched with great fanfare, the new payment methods have thus far seemed to fall flat with consumers, merchants, and, in some cases, the financial institutions meant to operate the payment platforms.

About one year after the Sand Dollar went nationwide (October 20, 2020), Sand Dollar circulation reached around B\$300,000; however, adoption was relatively flat for the following year. In May 2023, the Sand Dollar had about 104,664 consumer wallets and around 1,500 merchant wallets (CBOB 2023). After a series of Sand Dollar educational campaigns, promotions, and giveaways—as well as the integration of the rCBDC with government payments and the ACH system—circulation rose by about B\$1 million, reaching B\$1,099,910 by September 2023 (Branch, Ward, and Wright 2023). Still, this value amounts to only 0.19 percent of the total currency in circulation at the time.

Adoption of DCash was even smaller. Less than nine months after the start of the DCash pilot in 2021, the DCash platform went down for close to 10 weeks; when service was restored, around 4,000 wallet holders, roughly 20 financial institutions, and 10 government agencies across the ECCU were participating in the pilot. Later, DCash educational campaigns expanded and included in-person demonstrations. By March 2023, 400 merchants were participating. Overall, DCash circulation appears to have grown modestly from its initial issuance of EC\$2 million to EC\$2.45 million in March 2023 (ECCB 2022, 2023). This amount is still very small, accounting for only 0.16 percent of the total currency in circulation at the time.

JAM-DEX launched on July 11, 2022; by the end of the month, around 120,000 individuals and 2,300 merchants were reportedly on the JAM-DEX network via the Lynk platform. The first 100,000 customers to sign up for the rCBDC received an incentive bonus of JMD\$2,500, resulting in circulation increasing by JMD\$250 million. After this initial increase, circulation basically stalled. Consequently, the BOJ engaged in cash promotions, merchant outreach, and an education campaign to encourage adoption. By February 2023, these efforts had resulted in 185,410 individuals, 90 small merchants, and 4,500 micro merchants participating in JAM-DEX. Currently, JAM-DEX circulation is hovering around JMD\$257 million, roughly 0.11 percent of the total currency in circulation in Jamaica (Jamaica Observer 2022b; BOJ n.d.; Patterson 2023).

## Central bank explanations for low adoption

The Caribbean rCBDCs all failed to meet their expected adoption by consumers and merchants, challenging their main goal of transforming cash-based economies to digital economies. Although the rCBDCs use different foundational technologies, they share similar designs and privacy protections. Why was adoption of these rCBDCs so low?

The CBOB saw four factors leading to very low adoption of the Sand Dollar (Rolle 2022). First, merchants failed to participate in the Sand Dollar network. Second, the Sand Dollar was not integrated with the traditional banking system regarding merchant accounts. Third, banks and credit unions were slow to sign on to the Sand Dollar project. And fourth, customer education was inadequate, failing to show users how and why to use Sand Dollars.

The ECCB and Bitt have given three explanations for the slow adoption of DCash: failures in user education, the selling of use cases, and low merchant participation. A Bitt representative noted a “natural disinclination” among potential users to adopt a new technology and the failure of the ECCB to overcome this mindset (Phillips 2021). Customers were also not provided with any actual use cases for DCash. The ECCB has admitted that it failed to develop the merchant network, focusing on DCash development rather than on its implementation and use (Emmanuel 2023). Moreover, DCash was not integrated with merchant POS devices or with ECCU legacy financial systems, contributing to low adoption among merchants (ECCB 2021; CBDC Broadcast 2023).

For the BOJ, the main reasons for low JAM-DEX adoption were a lack of public education and difficulty in onboarding merchants. Consumers and merchants reported general apathy over the launch of JAM-DEX. The BOJ responded to this disinterest with “a national sensitization and education campaign” that promoted the importance of using the rCBDC among consumers (Jamaica Observer 2022a). However, the merchants wanting to accept JAM-DEX needed updated POS devices, and the BOJ did not incentivize or mandate commercial banks to modify their ATMs to accept and convert JAM-DEX (Sumner 2022). Unsurprisingly, commercial banks had little interest in promoting the rCBDC.

## Three observations from the Caribbean rCBDCs

The creation, launch, and resulting reception of the Sand Dollar, DCash, and JAM-DEX offer three basic observations about building and launching an rCBDC.

### *1. Underlying technology may have little effect on the adoption of rCBDCs.*

Each rCBDC uses different technology: Proof of Work protocol (Sand Dollar), Hyperledger Fabric (DCash), and centralized ledger (JAM-DEX). Some wallets were developed by the CBDC developer and some by commercial banks. These differences seem to have no effect on rates of adoption. Even the crash of DCash had little effect overall.

### *2. To adopt an rCBDC, consumers may need to be convinced of demonstrable added value.*

So far, all the Caribbean rCBDCs have failed to sell their purported advantages. The issuing central banks have interpreted consumer disinterest as a lack of digital experience, a “natural disinclination,” or a general apathy and responded by stressing education, with little effect on circulation numbers. Each central bank has not been able to demonstrate the added value of using its rCBDC to potential users. Consumers may not be uneducated or apathetic; instead, they may simply be practical, wondering what value an rCBDC has for them.

### *3. An rCBDC may need to be part of the entire payments ecosystem.*

An rCBDC may not be able to succeed as a stand-alone system, no matter how great its technology. The development of an rCBDC requires interconnection and integration with legacy financial and payments systems to get buy-in from all the mutually dependent stakeholders: consumers, merchants, and commercial banks.

For both consumers and merchants, a new rCBDC payment system needs to be integrated with legacy financial systems. For consumers, wallets need to be integrated with bank accounts to allow for effortless transfer of funds between bank accounts and rCBDC wallets. Otherwise, consumers are stuck with mastering an entirely new payments system, separate from the cash or card-based systems they already use. For merchants, an rCBDC payment system needs to interact with their existing POS devices, inventory systems, or bank accounts. Otherwise, the new rCBDC is burdensome and costly.

The complexity of achieving this integration seems to have discouraged commercial banks from joining in on a new rCBDC. In an intermediated system, these institutions are saddled with the responsibility of establishing all the consumer-oriented aspects of the new payments system. This could include updating ATMs, integrating POS devices, and even developing rCBDC wallets. However, with the Caribbean rCBDCs, banks received little promise of increased business or remuneration.

## Conclusion

None of the Caribbean rCBDCs has so far met expected adoption. Average circulation for the Sand Dollar, DCash, and JAM-DEX combined reached only 0.15 percent of all currency used in their areas, making it very challenging to achieve their overall goal of transforming the cash-based economies into digital ones.

From these ongoing, yet unsuccessful, undertakings, we have observed that to spur adoption, consumers may need more than just rCBDC technology. They may need the rCBDC to add value relative to cash, and they may need an rCBDC that is widely accepted, readily accessed, and easily used.

In sum, a central bank may not be able to approach the development of an rCBDC with the attitude of “if you build it, they will come.” The new payments system with an rCBDC may need to be integrated into existing payments systems; into ways that consumers, merchants, and banks do business; and, ultimately, into people’s lives.

## Endnotes

[1] Some of the information in this paragraph was obtained through a phone conversation with cofounder and chief operating officer of Movmint, Vinay Mohan, on April 10, 2023.

[2] This information was obtained through an email exchange with Vinay Mohan on April 5, 2023.



### Franklin Noll

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Franklin Noll began his professional life as a businessman. Coming from a small farming town in the Pennsylvania Dutch country, he studied business and computer science at Lehigh University. He then worked in the plastics industry before returning to school to study history. Earning a PhD in history at the University of Maryland, he taught history at the university level for several years, winning the Rundell Award for Teaching and being named a University of Maryland Distinguished Teacher. Noll then left academia to begin his own company, [Noll Historical Consulting, LLC](#), which is no longer in operation. Noll is a recognized authority on the history of money, Treasury securities, Civil War finance, and the US public debt. He has extensively written and spoken upon these topics, including making film and radio appearances and writing blogs for the US Treasury and Bloomberg News. Noll has embraced the new world of cryptocurrencies and DeFi, examining how a knowledge of monetary history can aid in their development. He is an expert columnist for CoinDesk, Cointelegraph, Be In Crypto, New Money Review, and other crypto news agencies and was elected a member of the Association of Cryptocurrency Journalists and Researchers and the Digital Euro Association. He was also an advisor to the [Vemanti Group, Inc.](#) on monetary history and policy and authored its stablecoin white paper. Noll has recently completed his fourth term as the President of the [Treasury Historical Association](#) and is featured in the production of an upcoming documentary film on the history of the Treasury Building being created by the Treasury Historical Association.