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LESSONS FROM THE FIRST CBDC INTRODUCTIONS

To date, four jurisdictions have introduced a Central Bank Digital Currency (CBDC). It is essential for countries considering or implementing the introduction of Central Bank Digital Currency (CBDC) to give due consideration to the advantages and disadvantages of previous introductions. The author examines the introduction and the experiences of the first few years of the Central Bank Digital Currency (CBDC) in circulation in the Bahamas, Nigeria, Jamaica, and the Eastern Caribbean Currency Union (ECCU). In the event of a larger-scale introduction, such as that of the digital euro, it is imperative that the mistakes made by these four jurisdictions are avoided. Furthermore, the author recommends that the best practices be given due consideration, provided that they are applicable in other legal frameworks.

Keywords: retail CBDC, Sand Dollar, eNaira, DCash, JAM-DEX.

1. INTRODUCTION

Central Bank Digital Currencies are the subject of increasingly widespread research and debate worldwide. The early CBDC rollouts that have taken place to date can provide numerous lessons for major national economies, including the European Union. In this analysis, the author first examines the economic and social reasons behind the creation of Central Bank Digital Currencies, before turning specifically to the economic and social reasons for each rollout. Finally, the author draws conclusions from the reasons behind the failed rollouts, with the aim of identifying how these problems can be prevented in the case of major national economies such as the EU, the US, China, and India – by learning from past mistakes.

2. POSSIBLE FORMS OF CBDC

According to the widely accepted definition, Central Bank Digital Currency (CBDC) is central bank money in digital form that differs from its traditional form as reserves and account balances (Bank for International Settlements, 2020). It follows clearly from this definition,

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established by the BIS and the seven largest central banks, that, like fiat money, CBDC may be capable of performing monetary functions whilst simultaneously integrating modern technology (such as DLT), along with its advantages (speed, transparency, widespread accessibility).

Examining possible types of CBDC, four criteria (form of appearance, form of settlement, method of issuance, user base) yield two sub-types each (Bujtar, 2021, pp. 24–26), defining a total of eight distinct forms of CBDC (Bossu *et al*., 2020, pp. 9–10).

Central Bank Digital Currency can be created either as a physical form of money (a token) or in the form of a claim (an account). Examples of account-based CBDCs include the digital dollar (The Digital Dollar Project, 2020), of token-based CBDCs the digital euro (The European Union Blockchain Observatory & Forum, 2021), whilst the Chinese digital yuan – Digital Currency Electronic Payment (DCEP) (Pan, 2020) – is partly token-based and partly account-based.

Two types can also be distinguished based on the form of settlement: the centralised and the decentralised form. Decentralised, non-central bank-settled Central Bank Digital Currency, typically blockchain-based, primarily carries cybersecurity risks. Blockchain-based CBDCs can also be implemented in a centralised form, which requires the development and operation of a suitably secure infrastructure, under central bank ownership and control. The centralised form is the realistic alternative of the two: in order to maintain control over money issuance (Radović, 2023, p. 36) and thus monetary policy (Bujtar, 2021, pp. 24–26).

With regard to issuance, the two distinguishable types are single-tier, or direct central bank issuance, and two-tier CBDC, the latter of which is created by the central bank recognising the claim issued by financial intermediaries as its own liability. In the case of two-tier CBDCs, however, a clear legal guarantee is required for the central bank to assume full liability, so that confidence in the financial system is also established with regard to the new currency (Friedman & Schwartz, 1987, p. 295).

The fourth approach to CBDC, based on the user base, involves the possibility of issuing either a general-purpose or retail CBDC, or a restricted, wholesale-type CBDC based on the members of the central bank's digital real-time gross settlement system (RTGS). General use goes beyond the current central bank settlement system (RTGS) and can ensure access to the new digital currency for those previously excluded from financial services (Bujtar, 2021, pp. 24–26).

3. EARLY EXPERIMENT – FINLAND

Surprisingly, the first CBDC was launched as early as 1993 in Finland as part of the Avant smart card project. The issuer was not the central bank, but a private company called Toimiraha (King, 2020), which, however, was wholly owned by the Bank of Finland during its first three years of operation (Dowd, 2024).

The number of cardholders reached 500,000 by 1995, but due to a lack of widespread use, the project was discontinued in 2006. The aim of the launch was to create a token-based CBDC that would replace the circulation of coins and small-denomination banknotes (Dowd, 2024). The application could be topped up with a maximum of 2,000 Finnish marks, and the top-up fee was 2 Finnish marks. The greater functionality of competing debit cards and the high top-up fee deterred end-users from using it, and the CBDC failed to gain widespread acceptance at payment terminals (King, 2020). In addition to the results of its own research project,

the Danish central bank also took into account the lessons from the Finnish failure when, despite low cash usage and the lack of significant added value, it rejected the introduction of a CBDC in June 2022 (Danmarks Nationalbank, 2022).

The reason for the failed launch, despite the advanced technology, was a lack of proper preparation and marketing – as Alexi Grym, the Finnish central bank's digital advisor, put it "[t]he thing with Finland is we are very good at technology but very bad at marketing" (King, 2020). According to the author, it is worth highlighting here that low cash usage does not automatically mean acceptance and use of a CBDC; furthermore, it is important to note that end-users' cost-sensitivity reinforces the continued existence of alternative payment systems (cards, cash) over the CBDC.

4. THE FIRST CBDC – THE BAHAMIAN SAND DOLLAR

The Bahamian Sand Dollar was officially launched in October 2000 (Anthony, 2025). The Exuma pilot programme was launched in October 2019 (CBB, 2019) and continued under the name Abaco in the first half of 2020, after Hurricane Dorian caused such severe damage to the Abaco archipelago in 2019 that the total value of the damage reached a quarter of the previous year's GDP (Boussidan, 2021). It was precisely this natural disaster, alongside the scattered nature of the archipelago, that prompted the creation of the Bahamian CBDC, independent of internet access.

According to the official website, the introduction of the Sand Dollar had four main objectives (Sanddollar, 2026): to increase the efficiency of the payment system by enabling safer and faster transfers; to ensure non-discriminatory access regardless of age, immigration or citizenship status; to increase financial inclusion by providing access to a wider range of financial services across the Bahamas; and to strengthen the fight against money laundering and banknote counterfeiting associated with cash use by reducing the use of cash.

The Bahamas' Central Bank Digital Currency was a digital form of the national currency pegged to the US dollar (1:1), which could be topped up to the value of $500 per month via an app and allowed for transactions of up to $1,500 per month. Tier-two users, meanwhile, could top up their wallets with up to USD 8,000 and conduct transactions totalling USD 10,000 per month, whilst utilising a higher-level security system (Boussidan, 2021). Sand Dollar, as a CBDC, was operated by crypto wallet providers (front-end services) whilst the central bank performed the back-end functions (Sanddollar, 2026).

The above objectives were partially achieved, with a significant proportion of the population – 30% – having the app by 2024; however, the CBDC in circulation did not even reach 1% of the amount of cash in circulation by 2024 (Anthony, 2025, pp. 4–5). Therefore, the appropriate metric for measuring the success of the CBDC's introduction is not the number of CBDC wallets, but the turnover they generate and its proportion relative to cash turnover and the turnover of cash substitutes. In April 2023, the Central Bank of the Bahamas launched a statistical report detailing the number of CBDC wallet providers and users, as well as the number of wallets, but this report was discontinued within a year (Anthony, 2025, p. 6).

Examining the reasons for the failure of the launch to date, it can be concluded that, despite the need for offline operation, it has not succeeded in providing any significant new functions compared to bank cards; furthermore, only a limited number of wallet providers were available and, with four exceptions, they did not advertise the CBDC on their websites (Anthony, 2025,

p. 4). The Bahamas' financial authorities attempted to encourage the circulation of CBDC through special incentives, but even so, based on the data available to date, the launch cannot be considered a success. The author considers it important to highlight that if the digital national currency is pegged to a strong national currency, such as the US dollar in this case, it is difficult in itself to find an attractive alternative to it; the growing popularity of stablecoins (Radović, 2023, p. 24) may pose a further challenge.

5. THE FIRST AFRICAN CBDC IS NIGERIA'S eNAIRA

According to a circular sent by the Central Bank of Nigeria to stakeholders on 25 October 2021, the eNaira was established under the Central Bank Act of Nigeria 2007 and the Banking and Other Financial Institutions Act 2020, pursuant to the authority granted to the Central Bank under Section 19 of the Central Bank Act of 2007 (Central Bank of Nigeria, 2021, p. 4). The eNaira is the digital form of the Nigerian national currency, the Naira, issued with the full backing of the Central Bank of Nigeria and having the same value as the Naira (Central Bank of Nigeria, 2021, p. 4). The eNaira complements the Naira with the aim of serving as a less costly, more efficient, and universally accepted and reliable means of payment. Further objectives include enhancing the effectiveness of monetary policy, ensuring a more efficient delivery of government social benefits to the intended recipients, and channelling remittances from citizens working abroad into formal channels. As an issuer of retail CBDCs, it was the first to issue eNaira as an account-based CBDC.

However, the launch was not met with widespread acceptance, as the wallet could initially only be used in conjunction with a bank account number; subsequently, the National Identification Number (NIN) was introduced, which no longer requires the use of a bank account and enables a truly inclusive CBDC usage (Central Bank of Nigeria, 2021, p. 8). eNaira has established a four-tier wallet structure, under which the central bank's wallet (eNaira Stock Wallet) holds the CBDC, and individual banks then store the CBDC received from the central bank in their own wallets (eNaira Treasury Wallet), holding the eNaira thus in their possession, which they can transfer on a branch-by-branch basis to the wallets of their individual bank branches (eNaira Branch Wallet). Non-financial service providers have such wallets (eNaira Merchant Super Wallet) that only accept credits and debits during the financial settlement of the products and services they sell. Finally, the eNaira Speed Wallet is used to process end-user transactions where eNaira is used; within this, the regulations distinguish between four different tiers (Tier 0–3) of customers authorised to use eNaira (Central Bank of Nigeria, 2021, pp. 9–10). The CBDC, i.e., the eNaira, will be convertible into other CBDCs (Central Bank of Nigeria, 2021, p. 4), which presupposes adequate technical interoperability with other CBDCs as well as with the eNaira itself.

Based on the above, technically, a well-structured account-based retail CBDC could well have met the criteria for successful implementation by bringing economy into the formal sector and making the delivery of social transfers and remittances from workers abroad more efficient. The mistake made by Nigeria's financial leadership was that the initial incentives – simpler identification, discounts – were followed in December 2022 by significant restrictions on cash withdrawals for both households and businesses (100,000 Naira – equivalent to USD 225 – for the former and 500,000 Naira – equivalent to USD 1,123 – for the latter) (Central Bank of Nigeria, 2022). Protests against these measures began, with demonstrators demanding the

restoration of access to fiat currency. It is clear that a forced cashless society cannot be achieved even with the help of a CBDC (Anthony, 2023). In 2021, 38% of the adult population in Nigeria lacked access to banking services (Ree, 2021), yet 50% of the population were already using cryptocurrencies by 2022 (Anthony, 2022). Remittances were significant in 2019, totalling USD 24 billion with fees of 1–5% (Ree, 2021) whilst the much cheaper eNaira was nevertheless used by less than 0.5% of the population in 2022 (Anthony, 2023).

6. DCASH IS THE ECCU'S CBDC

The Eastern Caribbean Central Bank tested DCash, developed by BiTT, in 2021, which was followed by the launch of DCash 2.0 in November 2023. During the pilot phase, it was tested in seven of the eight member states of the Eastern Caribbean Currency Union (Anguilla, Antigua and Barbuda, the Commonwealth of Dominica, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia, and Saint Vincent and the Grenadines), with the number of users reaching 600,000 (Gutierrez & Marz, 2022). However, in January 2022, the DCash Platform announced a widespread service outage, which, according to the ECCB, did not affect DCash holdings. In November 2023, DCash 2.0, building on the DCash pilot, enabled the instant settlement of G2P (government to person) and P2G (person to government) transactions in addition to P2P, P2B and B2B transactions. The aim of the CBDC within the ECCU is to support economic activity, expand the range of available payment system applications and streamline financial transactions, as well as to reduce the use of cash and the costs associated with it, and to encourage further digital payment innovations (Johnson, 2025). The launch of DCash 2.0 did not lead to a breakthrough by March 2025, as the volume of CBDC had fallen from 0.4 million ECCU dollars during the initial pilot phase to 0.2 million ECCU dollars by 31 March 2025 (ECCB Annual Report 2025) (ECCB, 2025, p. 65). The DCash project cited a lack of user education, shortcomings in the demonstration of use cases, and low merchant participation as the reasons for the failure (Noll, 2024).

7. THE JAMAICAN CBDC, JAM-DEX

The Bank of Jamaica received authorisation to issue a CBDC on 13 June 2022. Section 12(1) of the Bank of Jamaica Act of 2020 was amended, following a unanimous decision by the Jamaican Senate on 13 June 2022 (McIntosh, 2022). The CBDC (which is not blockchain-based) utilising DCS3 technology was developed exclusively for the issuance and use of the CBDC by Bitt (Ecurrency, 2020), a technology company based in Barbados. The CBDC issued by the Bank of Jamaica was launched following the central bank's 2020 regulatory sandbox (Bank of Jamaica, 2020). The aim of introducing the CBDC was to increase financial inclusion by introducing a new, efficient, and secure means of payment that is freely convertible into the national currency and, like cash, is suitable not only for paying for goods and services but also for storing value for businesses and individuals (Bank of Jamaica, 2020). Financial service providers can thereby improve their cash management services and reduce associated costs (Bank of Jamaica, 2020). By introducing a CBDC, the Bank of Jamaica can accelerate both the identification of the required money supply and the actual issuance of that supply whilst simultaneously significantly reducing the costs of putting money into circulation and promoting the digitalisation of the financial system (Haynes, 2020).

JAM-DEX is the first CBDC to utilise DSC technology, which was selected by the Bank of Jamaica from among 40 different bidders (Bank of Jamaica, 2020). The technology is not blockchain-based, yet it is capable of providing a secure solution from the data protection perspective, even in the era of quantum computers (Ecurrency, 2026). DSC technology enables instant and final transactions whilst maintaining low energy consumption (equivalent to a standard computer). DSC technology ensures user data protection without the central bank having access to users' data (Ecurrency, 2026). Another distinctive feature of JAM-DEX is that transfers of digital bearer instrument tokens take place via the Jamaican RTGS system (Noll, 2024). (A digital bearer instrument represents a transferrable claim on the issuer, which operates similarly to an asset-backed stablecoin.) (Garratt & Shin, 2023, p. 2). This DSC technology enables offline transactions, as the credit or balance is only verified by the party acquiring the CBDC at a later stage, when a debit is made from that wallet.

Despite the above technological innovations, the launch of JAM-DEX cannot be considered a success in terms of usage. Following its launch in 2021, even after two annual incentives, no breakthrough was achieved in either the volume of CBDC issued or its usage. The amount of CBDC issued reached 250 million Jamaican dollars in May 2022 and stagnated over the following year and a half, whilst the fiat currency rose from 200 billion Jamaican dollars to 255 billion Jamaican dollars (Anthony, 2025). Several factors lie behind the low level of interest: firstly, a lack of adequate education; secondly, a lack of interest among merchants; and thirdly, a lack of commitment from commercial banks. The last was evident in the fact that whilst merchants would have expected POS terminals to integrate JAM-DEX payments, commercial banks were in no hurry to make ATMs compatible with JAM-DEX.

Based on the above, it is clear that well-designed technology alone is not sufficient for the successful introduction of a CBDC. This requires winning over a wide range of intermediaries, as well as convincing the public; in the latter case, incentives are not sufficient tools.

8. GENERAL SUMMARY OF THE INTRODUCTION OF FIRST CBDCs

In summary, based on the above, it can be concluded that all four CBDCs discussed aimed to increase access to financial services, reduce the use of cash, and ensure offline functionality in the event of potential network issues. The central banks concerned typically introduced the CBDC following a pilot programme or as part of a longer-term financial digitalisation programme.

Despite all this, widespread use has not yet been achieved in any of the four jurisdictions. CBDCs cannot be regarded as a digital form of fiat currency, but rather as an experiment supported by various incentives, albeit one that has so far met with limited success. Due to a lack of adequate financial education, coupled with a lack of interest from financial intermediaries, end-users, and accepting merchants, CBDC usage has extended to only a few per cent of the total money supply.

Examining the three Caribbean CBDCs, a study by the Digital Euro Association (Guiterrez & Marz, 2022) highlighted several common lessons: thus, the basic functions are less competitive on their own, and in the future, the real added value may lie in cross-border transfers and programmable payment functions. The example of DCash, in the case of subcontractors, clearly illustrates the risk that a significant operational disruption could undermine the trust that is being built.

A study by the Federal Reserve Bank of Kansas City (Noll, 2024), analysing central bank explanations for low adoption, concluded that the primary goal of transitioning from a cash-based economy to a digital economy failed for three reasons: the underlying technology does not influence the success of the introduction; consumers and end-users alike could not be convinced of the added value of the CBDC; and finally, for a successful introduction, the CBDC should be presented to all stakeholders (consumers, merchants, financial intermediaries) and accepted and operated in collaboration with them.

The author considers it necessary to add the following to the above. A CBDC does not sell itself; it needs a unique value proposition to stand out amongst the many electronic payment instruments and methods. Forced introduction and the accelerated phasing out of cash are not suitable means of increasing widespread use – as the example of the eNaira has shown – and are, in fact, counterproductive. In addition to the two major end-user groups – the general public and businesses – it is also necessary to secure the interest of wallet providers and financial intermediaries. Data protection and anonymous usage have been well-established, but this is not sufficient, as electronic payment methods can also guarantee this. In addition to financial incentives, it is necessary to channel financial transactions on a mass scale into CBDC form, as well as to consider the possibility of interest payments.

For a successful introduction (Anthony, 2025, p. 8), it is necessary that the measurement of the introduction's effectiveness should provide an accurate picture of the necessary points of intervention. Thus, when introducing a CBDC, it is necessary to measure the various stages of conversion, identifying who is open to the CBDC, who downloads the application, and who uses it regularly. According to the author, government incentives should therefore extend not only to the downloading of the application, but to all three key stages of the rollout and thus to the entire adaptation and conversion process.

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