Central Bank Digital Currencies: A solution to India's financial woes or just a piece of the puzzle?

Policy Brief

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Central Bank Digital Currencies (CBDCs) have, over the last couple of years, stepped firmly into the global financial spotlight. India is no exception to this trend, with both the Reserve Bank of India (RBI) and the Finance Minister referring to an Indian CBDC that is currently under development.[1]

With the introduction of this CBDC a matter of when and not if, India and many other countries stand on the precipice of re-imagining their financial systems. It is therefore imperative that any attempt at introducing a CBDC is preceded by a detailed analysis of its scope, benefits, limitations, and how it has been implemented in other jurisdictions. This policy brief looks to achieve that by examining the form that a CBDC could take, what its policy goals would be in India, the considerations the RBI would have to account for and whether a CBDC would work in present-day India. Finally, it also looks at the case of Nigeria to draw insights that could also be applied to the introduction and operationalisation of a CBDC in the Indian context.

Defining A CBDC

Armelius, Claussen, and Hull define a CBDC as *"a digital object that (i) has a given value expressed in the national unit of account and (ii) is a claim on the respective central bank."*[2] It is worth noting here that by 'digital object,' the authors refer not to any specific form but merely any sequence of bits or digital information that satisfies the two conditions.[3]

The Deputy Governor of the RBI defined a CBDC as "*the legal tender issued by a central bank in a digital form. It is the same as a fiat currency and is exchangeable one-to-one with the fiat currency*."[4] Given that CBDCs are considered fiat currency, any issuing of a CBDC would therefore appear as a liability on the RBI's balance sheet.

CBDCs do not, however, operate as a monolith - rather, there are a multitude of possible operational structures that a CBDC could adopt, meaning that CBDCs around the world could look vastly different despite having the same goals. These differences are based on:

1. Role of Central Bank

CBDCs can be categorised depending on the role that the issuing central bank plays in its operation into unilateral, hybrid/intermediate, or synthetic CBDCs.

[1] Hemant Kashyap, 'Indian CBDC In Offing, Assures Finance Minister', Inc42 Media (blog), 9 March 2022, https://inc42.com/buzz/indian-cbdc-in-offing-assures-finance-minister/.

[2] Hanna Armelius, Carl Andreas Claussen, and Isaiah Hull, 'On the Possibility of a Cash-like CBDC', *EconStor Preprints*, EconStor Preprints (ZBW - Leibniz Information Centre for Economics, 2021), https://ideas.repec.org/p/zbw/esprep/231485.html.

[3] Ibid

[4] T Rabi Sankar, 'Central Bank Digital Currency – Is This the Future of Money', https://www.rbi.org.in/Scripts/BS_SpeechesView.aspx?Id=1111.

- ### Unilateral CBDC
  A unilateral CBDC is one where the central bank adopts complete control and responsibility for the functioning of the CBDC.

- ### Hybrid or Intermediate CBDC
  A hybrid or intermediate CBDC is one where the CBDC would be issued by the central bank, but certain functional activities - such as verifying and maintaining a record of transactions - would be carried out by private entities that are regulated by the central bank. The degree to which functions are delegated to actors that are not the central bank may vary; however, it is a requisite that the issuing of the CBDC is done solely by the central bank.

- ### Synthetic CBDC
  Finally, under a synthetic CBDC model, the issuance of the CBDC would be done by private entities and not the central bank. These private entities (which would most likely be commercial banks) would issue CBDCs that are backed by central bank liabilities, thereby ensuring that they would in essence appear as a liability on a central bank's balance sheet.

  In any given instance, the determination of whether a CBDC will be unilateral, hybrid, or synthetic is contingent to a large degree on the amount of additional responsibility that a central bank is willing to adopt, and its bandwidth to accommodate the additional workload.

2. Retail or wholesale

A CBDC can also be characterised as being wholesale or retail based on who it is issued to, and the purpose it looks to serve the issuer.

- ### Wholesale CBDC
  Wholesale CBDCs would be issued for financial institutions which currently hold reserved deposits with a central bank, and would facilitate payments between these institutions at the bank level.[5]

[5] 'Central Bank Digital Currency (CBDC): Wholesale CBDC Global Developments', Central Bank Digital Currency: The Series (Payments Canada, n.d.), http://www.payments.ca/sites/default/files/cbdc_series-paper_4-wholesale_cbdc_global_developments.pdf.

- **Retail CBDC**
  Retail CBDCs, on the other hand, would be issued to the general public, intended to be used as a form of general legal tender.[6]

3. Underlying technology and account form

With CBDCs being developed in a financial environment that has seen private crypto-assets establish themselves as a mainstay, there is a tendency to associate CBDCs with blockchain and Distributed Ledger Technology (DLT).[7] However, it is worth noting that while blockchain *could* be used to operationalise a CBDC, it is by no means a prerequisite. Rather, based on the underlying technology used, CBDCs can adopt multiple forms of distribution and will therefore have different consumer-facing interfaces:

- **Account-based CBDC**
  With account-based CBDCs, individuals and entities would hold accounts under the central bank. Such a system would essentially involve utilising technology to scale the central bank's ability to provide banking and account services to the entirety of a state's population. It is worth remembering that in the case of an account-based CBDC, the central bank would require a remote ledger that is held by a third party (either the central bank or the commercial banks who have been tasked with operationalising the CBDC) to maintain a comprehensive list of all transactions.[8] However, such a remote ledger can be centralised, for example by being under the control of the central bank, and need not be distributed as is the case with DLT and blockchain.

- **Token-based CBDC**
  A token-based CBDC would be a form of digital cash "*that would circulate in a decentralized way without [a] central ledger*."[9] Such a system would make use of DLT or blockchain technology to ensure that transactions would not have to be validated by a

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[6] Neeta Gupta, 'What Are Retail and Wholesale Central Bank Digital Currencies (CBDCs)', *Akeo* (blog), 29 September 2020, https://medium.com/akeo-tech/what-are-retail-and-wholesale-central-bank-digital-currencies-cbdcs-5c49d81dbbcc.

[7] *This tendency can be seen in the definitions provided in the following papers, which make express reference to the use of distributed ledger technology:*
Sergio Luis Náñez Alonso, Javier Jorge-Vazquez, and Ricardo Francisco Reier Forradellas, 'Central Banks Digital Currency: Detection of Optimal Countries for the Implementation of a CBDC and the Implication for Payment Industry Open Innovation', *Journal of Open Innovation: Technology, Market, and Complexity* 7, no. 1 (March 2021): 72, https://doi.org/10.3390/joitmc7010072.

[8] Hanna Armelius, Carl Andreas Claussen, and Isaiah Hull, 'On the Possibility of a Cash-like CBDC', *EconStor Preprints*, EconStor Preprints (ZBW - Leibniz Information Centre for Economics, 2021), https://ideas.repec.org/p/zbw/esprep/231485.html.
Ulrich Bindseil, 'Tiered CBDC and the Financial System', *Working Paper Series*, Working Paper Series (European Central Bank, January 2020), https://ideas.repec.org/p/ecb/ecbwps/20202351.html.

[9] Ulrich Bindseil, 'Tiered CBDC and the Financial System', *Working Paper Series*, Working Paper Series (European Central Bank, January 2020), https://ideas.repec.org/p/ecb/ecbwps/20202351.html.

third party such as a central bank. Rather, transactions are validated through the consensus mechanism that is used by the blockchain.

For the purpose of this policy brief, and in line with the direction that the RBI seems to be heading in, we shall be focusing on the implementation of a retail CBDC that is either unilateral or hybrid.

Legality Of CBDCs In India

Prior to any examination of the costs and benefits associated with CBDCs in the Indian context, it is important to establish whether CBDCs can be considered a viable possibility under India's legislative framework. In order to ensure that a CBDC can be introduced in India, two criteria must be met: i) the central bank must have the sole authority to issue legal tender in India and, ii) legal tender must be able to assume digital form under the appropriate legal framework. These two considerations are addressed by the Reserve Bank of India Act, 1934 and the 2022 Finance bill respectively.

Reserve Bank of India Act, 1934

Section 22 of the Reserve Bank of India Act, 1934 entrusts the RBI with the "sole right to issue bank notes in India."[10] Moreover, Section 26 of the Act also lays down that *"...every bank note shall be legal tender at any place in India in payment or on account for the amount expressed therein, and shall be guaranteed by the Central Government*."[11] Therefore, these two provisions when read together satisfy the first required condition.

2022 Finance Bill

The 2022 Finance Bill looked to specifically address the second condition and lay the groundwork for the eventual adoption of a CBDC in India. The bill introduced an amendment to the Reserve Bank of India Act, 1934 where the definition of a bank note was specified as *"...a bank note issued by the Bank, whether in physical or digital form, under section 22*"[12] This amendment ensures that should the RBI introduce a CBDC - regardless of whether it is an account or token-based CBDC - it would be legally permissible under the provisions of the Reserve Bank of India Act, 1934.

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[10] §22, Reserve Bank of India Act, 1934, https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/RBIAM_230609.pdf

[11] §26(1), Reserve Bank of India Act, 1934, https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/RBIAM_230609.pdf

[12] §124, 2022 Finance Bill, https://www.indiabudget.gov.in/doc/Finance_Bill.pdf

What Do CBDCs Aim To Achieve?

Regulators and central banks around the world have identified several policy goals that CBDCs would facilitate, most notably centred around the issue of financial inclusion.

1. Financial Inclusion

Proponents of CBDCs argue that their introduction would support financial inclusion by allowing low-income communities to have access to central bank-backed accounts and payment systems.[13] A survey of central banks conducted by Barontini and Holden found that financial inclusion was one of the top priorities among emerging market economies that were looking to introduce a CBDC.[14] Being digital, CBDCs would also eradicate a multitude of physical and geographical limitations that prevent low-income individuals from accessing banking and financial services. Moreover, being under the control of the central bank, a CBDC can enhance access for those individuals who may currently be excluded from banking infrastructure due to the inability to meet bank requirements laid down by commercial banks.

2. Improved payments infrastructure and increased competition

The payments architecture associated with the CBDC would also allow for a simple and easy way for individuals to make payments without being constrained by the physical limitations of cash (or cheques and other physical payment mechanisms). CBDCs could, therefore, provide additional competition to the payments sector by both acting directly as a rival to existing payment structures, and by facilitating the entry of new enterprises by providing an open platform and framework that is free for all to use.[15]

3. System reliance

Digital payment systems have firmly embedded themselves into the functioning of modern financial systems. Their widespread adoption and use have cemented them as an essential feature in any modern economy. Therefore, given the reliance on these systems, their

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[13] Raphael Auer et al., 'Central Bank Digital Currencies: A New Tool in the Financial Inclusion Toolkit?', 12 April 2022, https://www.bis.org/fsi/publ/insights41.htm.

[14] Christian Barontini and Henry Holden, 'Proceeding with Caution - A Survey on Central Bank Digital Currency', SSRN Scholarly Paper (Rochester, NY, 8 January 2019), https://papers.ssrn.com/abstract=3331590.

[15] Vipul Kharbanda, 'Decoding India's Central Bank Digital Currency (CBDC) — The Centre for Internet and Society', *CIS Blog* (blog), 6 April 2022, https://cis-india.org/internet-governance/blog/decoding-india2019s-central-bank-digital-currency-cbdc.

smooth functioning remains critical. The introduction of a CBDC would function as a public alternative to private digital payment systems and would therefore create a contingency system that can be relied upon in case of any technical or other failure faced by a private digital payment system.[16]

Moreover, traditional payment systems have an inherent credit and liquidity risk present in them that arises from the fractional reserve lending function of banks. CBDCs would help address some of these risks as units of the CBDC are not backed by cash deposits within private banks but are backed by the central bank. Since the Reserve Bank does not operate as a public lender, and CBDCs are issued directly by the central bank, they should not be faced with credit or liquidity risks.[17]

4. Traceability and reduced use of money for illicit activities

The introduction of a CBDC, in conjunction with enhanced requirements for Anti-Money Laundering (AML) and Combating the Financing of Terrorism (CFT), could result in a reduction in the use of legal tender for illicit purposes.[18] It should be noted, however, that any CBDC that is easily traceable is unlikely to be used for illicit purposes to begin with.

5. Conditional transactions and programmable money

CBDCs represent a unique opportunity for central banks due to their digital and programmable nature, which allows transactions to be programmed to occur instantly when certain conditions are met.[19] For example, this could be used in the context of facilitating tax payments automatically when a commercial transaction is made. Moreover, the central bank can also issue CBDC tokens that can be limited in their use. For example, a specific set of CBDC subsidy tokens could be issued that can only be spent on specific subsidised products.

6. Decrease in private crypto-asset use

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[16] Ibid

[17] 'Money and Payments: The U.S. Dollar in the Age of Digital Transformation' (Federal Reserve System, January 2022), https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf.

[18] 'Central Bank Digital Currencies' (Committee on Payments and Market Infrastructures: Markets Committee, March 2018), https://www.bis.org/cpmi/publ/d174.pdf.

[19] Vipul Kharbanda, 'Decoding India's Central Bank Digital Currency (CBDC) — The Centre for Internet and Society', *CIS Blog* (blog), 6 April 2022, https://cis-india.org/internet-governance/blog/decoding-india2019s-central-bank-digital-currency-cbdc.

The RBI has voiced the belief that the introduction of CBDCs would make redundant the use case for private crypto-assets.[20] This belief stems from the idea that private crypto-assets such as Bitcoin were developed as a novel medium of exchange that would look to replace traditional money.[21]

Potential Risks Associated With CBDCs

The implementation of CBDCs will undoubtedly have a significant knock-on effect on a nation's financial and economic systems. It is therefore prudent to examine the potential risks that CBDCs carry with them and the various considerations that a central bank will have to account for when looking to introduce a CBDC.

1. Effect on bank deposits

The banking system in modern economies is built largely based on fractional reserve lending where commercial banks make use of deposits held by them on behalf of their customers to provide loans. The introduction of a CBDC could significantly affect this system with CBDCs acting as a close substitute for deposits held at commercial banks. This could result in a situation where there is a decrease in total deposits held by commercial banks, leading to a subsequent increase in credit costs and reduction of available credit.[22] This problem would only be further magnified in the case of an interest-bearing CBDC. An interest-bearing CBDC could precipitate a shift among investors with them preferring to hold CBDCs rather than investing in other low-risk financial instruments.[23]

These considerations could, however, be managed through the design of the CBDC. Ensuring that CBDCs are non-interest bearing, as well as placing limitations on how much money a consumer can hold as a CBDC, are some measures that a central bank might consider.[24]

2. Danger of a run on banks

[20] T Rabi Sankar, 'Central Bank Digital Currency – Is This the Future of Money', https://www.rbi.org.in/Scripts/BS_SpeechesView.aspx?Id=1111.

[21] Satoshi Nakamoto, 'Bitcoin: A Peer-to-Peer Electronic Cash System', *Manubot* (Manubot, 20 November 2019), https://git.dhimmel.com/bitcoin-whitepaper/.

[22] 'Money and Payments: The U.S. Dollar in the Age of Digital Transformation' (Federal Reserve System, January 2022), https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf.

[23] Ibid

[24] Ibid

In situations of financial instability, CBDC holdings would become increasingly appealing to consumers as they are backed by the central bank. Moreover, given their digital nature, it would be easy to convert other forms of money - such as commercial bank deposits - into CBDC holdings. In cases of financial uncertainty, this ease of conversion and propensity towards CBDCs could result in a situation where bank runs become more frequent, as consumers look to liquidate their money from banks into CBDCs. In such a situation, existing government policies such as guarantees could prove to be ineffective in preventing a bank run.

It is important to note that in situations of an individual bank run, CBDCs are unlikely to have much of an effect as money can already be transferred digitally between weak and strong banks.[25] However, in instances of a systematic banking crisis, converting other forms of money into a CBDC would theoretically face lower costs and be easier than cash withdrawals and could accelerate the crisis.[26] It is worth noting, however, that this is once again dependent on the design of the CBDC. Central banks could, once again by placing limits on how much CBDC can be held or how much can be converted from a deposit to a CBDC, mitigate these concerns to an extent.

Will CBDCs Work? Situating The Effectiveness Of CBDCs In The Indian Context

As previously mentioned, there are several general risks that must be accounted for by any central bank when looking to implement a CBDC. However, CBDCs do not function in a vacuum. Their ability to achieve policy goals is fundamentally limited by and contingent on the socio-economic structures and institutions that exist within each country. In this section, we look at certain constraints that arise in the Indian context and evaluate whether a CBDC would be able to achieve its proposed goals in India. For this section we will focus on the following goals of CBDCs as mentioned by the RBI: financial inclusion, making payments systems more accessible and eradicating the need for private crypto-assets.

1. Financial Inclusion

As with the introduction of any novel technological solution, a CBDC's ability to promote

[25] 'Central Bank Digital Currencies: Financial Stability Implications' (Bank for International Settlements, September 2021), https://www.bis.org/publ/othp42_fin_stab.pdf.

[26] Ibid

financial inclusion is fundamentally limited by the extent of digital penetration in India. As per the Telecom Regulatory Authority of India, the number of internet subscribers per 100 in India currently sits at around 60.4%,[27] far below the necessary requirement for a CBDC to become ubiquitous across India. This number is much lower when taking into consideration rural India, where the number sits close to 37%.[28] Furthermore, these numbers do not take into account multiple internet subscriptions held by the same individual or household, so in real terms, internet penetration would be even lower.[29]

Data from the 2019 survey on Household Social Consumption: Education[30] also indicates the disparity in internet access among economically and socially marginalised communities - particularly on the basis of class, location, and gender. The following tables demonstrate the disparity in internet use across these lines.

Figure 1: Percentage of households having internet facility for each quintile class of Usual Monthly per capital expenditure[31]

Statement 7.3: Percentage of households having internet facility for each quintile class of Usual Monthly per Capital Expenditure

all-India

UMPCE Quintile Class	percentage	
	rural	urban
0-20	6.6	19.8
20-40	9.2	29.4
40-60	12.4	38.0
60-80	15.0	46.3
80-100	27.1	61.6
all	14.9	42.0

Figure 2: Percentage of persons of age 5 years and above who are able to use internet[32]

[27] 'The Indian Telecom Services Performance Indicators: October – December, 2021' (New Delhi, India: Telecom Regulatory Authority of India, 4 May 2022), https://www.trai.gov.in/sites/default/files/QPIR_05052022.pdf.

[28] Ibid

[29] Ibid

[30] Ministry of Statistics & Programme Implementation. 2019. "Key Indicators of Household Social Consumption on Education in India NSS 75th Round (July 2017- June 2018)." Government of India. http://mospi.nic.in/sites/default/files/publication_reports/Report_585_75th_round_Education_final_1507_0.pdf.

[31] Ibid

[32] Ibid

Statement 7.5: Percentage of persons of age 5 years and above who are able to use internet

all-India

age of the person	percentage		
	male	female	person
rural			
5-14 years	6.0	4.1	5.1
15-29 years	38.8	21.3	30.4
15-59 years	22.9	10.9	17.0
60 years and above	1.7	0.5	1.1
15 years and above	20.3	9.6	15.1
5 years and above	17.1	8.5	13.0
urban			
5-14 years	20.9	18.1	19.7
15-29 years	69.4	56.3	63.2
15-59 years	52.9	36.0	44.7
60 years and above	15.3	5.3	10.3
15 years and above	48.5	32.3	40.6
5 years and above	43.5	30.1	37.1
rural+urban			
5-14 years	9.8	7.6	8.8
15-29 years	48.2	31.9	40.4
15-59 years	32.2	18.5	25.5
60 years and above	5.8	1.9	3.9
15 years and above	29.0	16.5	22.9
5 years and above	25.0	14.9	20.1

Since these are the very communities that financial inclusion seeks to benefit, the introduction of a CBDC - if not supported with significant plans around improving digitisation and connectivity - will have little real-world impact. Even in situations where there is adequate internet and smartphone penetration, digital literacy remains a key issue. NSS data has demonstrated that at present, only close to 38% of all households in India are digitally literate, with the number being significantly lower in rural India at around 25%.[33]

2. Making payments systems more accessible

For the adoption of CBDCs as a means of payment to be widespread, its consumer-facing payment platform would have to be designed in a manner that keeps in mind the linguistic diversity in India. This, however, can prove to be difficult. Take existing payment mechanisms such as Google Pay, PhonePe, and Paytm. They are offered in

[33] Venugopal Mothkoor and Fatima Mumtaz, 'The Digital Dream: Upskilling India for the Future', *Ideas For India* (blog), 23 March 2021, http://www.ideasforindia.in/topics/governance/the-digital-dream-upskilling-india-for-the-future.html.

10, 11 and 11 languages respectively. This is a far cry from the Indian constitution's VIIIth Schedule which recognises 22 languages (not to make mention of the multitude of dialects spoken around India).

3. Limiting private crypto-asset use

The RBI has noted that one of the goals it seeks to achieve through the introduction of a CBDC is to eliminate the use case for private crypto-assets. The use case that they refer to here is that of using private crypto-assets as a means of exchange. However, in its assessment, the RBI fails to understand the material reality of how crypto-assets operate in the modern day. While initially envisioned as a means of exchange, crypto-assets have since primarily been used as a tool for speculative trading and arbitrage.[34] Even in instances where they have been legalised as a means of payment, they have not witnessed significant adoption.[35] Therefore, it is clear that consumers do not generally see private crypto-assets as being a new medium of exchange, but rather as a tool for generating speculative profits. To that end, the introduction of a CBDC will have very little effect on the trading of private crypto-assets.

International Perspectives

Currently, 10 countries have launched their own CBDCs. It is therefore imperative that policymakers in India identify lessons from these other jurisdictions when examining the feasibility of a CBDC in India. In this section, we will examine one such country - Nigeria.

Nigeria has been selected here due to its similarity with India as a developing economy. The following table outlines a brief comparison between India and Nigeria along certain key metrics:

Table 1: Comparison of economic factors and technological penetration between India and Nigeria[36]

[34] Dirk G. Baur, KiHoon Hong, and Adrian D. Lee, 'Bitcoin: Medium of Exchange or Speculative Assets?', *Journal of International Financial Markets, Institutions and Money* 54 (1 May 2018): 177–89, https://doi.org/10.1016/j.intfin.2017.12.004.

[35] Steve Hanke, Nicholas Hanlon, and Mihir Chakravarthi, "Bukele's Bitcoin Blunder," Studies in Applied Economics, Studies in Applied Economics (The Johns Hopkins Institute for Applied Economics, Global Health, and the Study of Business Enterprise, June 23, 2021), https://ideas.repec.org/p/ris/jhisae/0185.html.

[36] Authors compilation. Compiled using world bank data.
'GDP per Capita, PPP (Current International $) | Data', accessed 20 June 2022, https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD.
'Gini Index | Data', accessed 20 June 2022, https://data.worldbank.org/indicator/SI.POV.GINI.
'Individuals Using the Internet (% of Population) | Data', accessed 20 June 2022, https://data.worldbank.org/indicator/IT.NET.USER.ZS.
'Mobile Cellular Subscriptions | Data', accessed 20 June 2022, https://data.worldbank.org/indicator/IT.CEL.SETS.

Metric	India	Nigeria
PPP per capita	$6,503.90	$5,186.40
Gini coefficient	35.7	35.1
Percentage of population using the Internet	43%	36%
Mobile cellular subscriptions per 100 people[37]	84	99

E-Naira

E-Naira, Nigeria's proprietary CBDC, was first introduced on October 25th 2021 by Nigerian President Muhammadu Buhari.[38] Our analysis of the E-Naira will look at its purpose, architecture, and finally its legislative framework.

1. **Purpose**

   E-Naira's design paper outlines how the E-Naira has been instituted by the Central Bank of Nigeria (CBN) to "*enable households and businesses to make fast, efficient, and reliable payments, while benefiting from a resilient, innovative, inclusive, and competitive payment system*"[39] It also articulates 5 key economic goals underpinning the initiative. These include:

   - "Financial Inclusion
   - Empowerment and Poverty reduction
   - Improved monetary and financial stability policies
   - Improved Forex position
   - Growth in cross border trade"[40]

2. **Architecture and operation**

   E-Naira is an accounts-based hybrid CBDC that makes use of Hyperledger Fabric (a form of DLT). E-Naira utilises a two-tiered system wherein the CBN is responsible for

[37] It should be noted that this does not metric does not make a distinction between smart and feature phones

[38] 'President Buhari To Unveil ENaira on Monday, 25 October 2021' (Central Bank of Nigeria, 23 October 2021), https://www.cbn.gov.ng/Out/2021/CCD/eNaira%20Launch%20Press%20release%20%20231021.pdf.

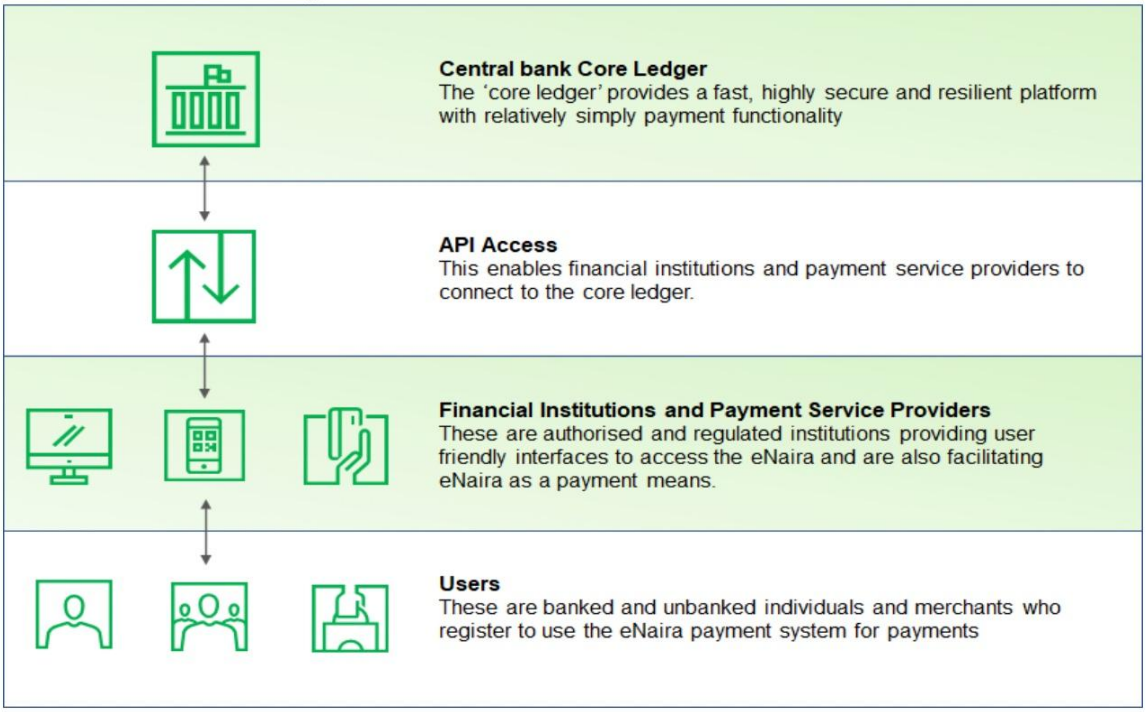
[39] 'Design Paper for the ENaira' (Central Bank of Nigeria, n.d.), https://www.enaira.gov.ng/download/eNaira_Design_Paper.pdf.

[40] Ibid

designing, issuing and storing E-Naira. The CBN then distributes E-Naira to financial institutions, international money transfer operators (IMTOs) and agents.[41]

Under this system, the CBN will also be tasked with maintaining a centralised ledger of all transactions conducted using E-Naira. Meanwhile, commercial actors are responsible for acting as the interface for consumers to interact with and access E-Naira. They are tasked with the handling and processing of retail transactions using E-Naira. Moreover, the E-Naira has been designed in such a manner whereby it serves as a platform for other financial institutions to innovate on and build services on top of.

Figure 3: Explaining the architecture of the E-Naira[42]



As mentioned earlier, the E-Naira is an account-based CBDC. However, it adopts a tier for its accounts (called wallets) as well, making special provisions for individuals without bank accounts. It also makes a distinction between individual account holders, merchant account holders[43] and accounts held by banks.

[41] Ibid

[42] Ibid

[43] A merchant is defined as a "Duly accredited individuals and non-individual (corporates) authorized to conduct business in Nigeria"
'Regulatory Guidelines on the ENaira' (Central Bank of Nigeria, 25 October 2021), https://www.cbn.gov.ng/Out/2021/FPRD/eNairaCircularAndGuidelines%20FINAL.pdf.

We first begin by examining the tiered system of wallets for individuals:

A. *Tiers for individuals without bank accounts*

- **Tier 0**[44]
  Tier 0 wallet holders are those individuals who do not either possess a bank account or a national identification number (NIN). All that is needed for obtaining such an account is a valid telephone number. In such a case Holders of such an account have a daily transaction limit of 20,000 Naira and a daily cumulative balance of 1,20,000 Naira.
- **Tier 1**[45]
  Tier 1 wallets are aimed at individuals who do not possess a bank account but do have a verified NIN. In this case, a valid telephone number and NIN can be used to obtain a wallet. This wallet has a daily transaction limit of 50,000 and a daily balance of 3,00,000.

B. *Tiers for individuals with bank accounts*

- **Tier 2**[46]
  Tier 2 wallets are aimed at minimum spending bank account holders. A valid Bank Verification Number (BVN), telephone number and a number of other KYC requirements are necessary to open this account. The wallet has a daily transaction limit of 2,00,000 and a daily balance of 5,00,000.
- **Tier 3**[47]
  Tier 3 accounts are aimed at regularly spending consumers. It has the exact requirements as a tier 2 wallet. A tier 3 wallet has a daily limit of 5,00,000 and a daily balance of 50,00,000.

C. *Merchant wallets*[48]
   Merchant wallets do not possess a similar categorisation. Merchant wallet holders require a valid BVN, NIN, Tax Identification Number and a confirmation from the bank. They do not have any limits on daily transactions or daily balances.

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[44] 'Design Paper for the ENaira' (Central Bank of Nigeria, n.d.), https://www.enaira.gov.ng/download/eNaira_Design_Paper.pdf.

[45] Ibid

[46] Ibid

[47] Ibid

[48] Ibid

D. Bank held wallets

In the case of banks, a number of differing wallets have also been conceptualised:

- **Stock wallet**
  This wallet is held and controlled by the CBN and acts as a store of all minted E-Naira.[49]
- **Treasury Wallet**
  Each financial institution can create a treasury wallet to store E-Naira that it receives from the CBN's stock wallet.[50]
- **Branch Wallets**
  A financial institution with a treasury wallet may create branch wallets for its various branches that are then funded by its treasury wallets.

3. Legislative Framework

The rules governing the functioning of E-Naira have been outlined by the CBN in the 'Regulatory Guidelines on the eNaira,' released on October 25, 2021.[51] The guidelines define the E-Naira as "*the digital form of the Naira, issued by the CBN in line with Section 19 of the CBN Act. It is a direct liability of the Bank, a legal tender and will form part of the currency-in-circulation and will be at par with the physical Naira (that is 1:1)*."[52]

The regulations articulate the obligation of financial institutions that operate E-Naira wallets to comply with the 2011 Money Laundering (Prohibition) Act and the 2011 Terrorism (prevention) Act.[53] It also states that any other rules or regulations issued by the CBN relating to anti-money laundering must also be complied with by the financial institutions.

The E-Naira also has a dedicated dispute resolution mechanism, with the regulations also placing clear obligations on financial institutions to follow specific procedures and processes in cases of lost, or stolen wallets - so as to ensure a speedy recovery of the wallet.

Finally, the regulations allow for various ministries to receive and make payments through the use of E-Naira and will be onboarded subject to a mandate to that effect.[54]

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[49] 'Regulatory Guidelines on the ENaira' (Central Bank of Nigeria, 25 October 2021), https://www.cbn.gov.ng/Out/2021/FPRD/eNairaCircularAndGuidelines%20FINAL.pdf.

[50] Ibid

[51] Ibid

[52] Ibid

[53] Ibid

[54] Albert A Adu and Simbiat Okwilague, 'ENaira – A New Dimension To Payments In Nigeria - Fin Tech - Nigeria', *Mondaq* (blog), 8 April 2022, https://www.mondaq.com/nigeria/fin-tech/1181108/enaira-a-new-dimension-to-payments-in-nigeria.

Lessons for India

Nigeria's introduction of E-Naira has outlined key lessons for India that must be carefully assessed prior to adopting an Indian CBDC.

First, any CBDC that is introduced in India must be done keeping in mind those currently outside of formal banking infrastructure. The tiered approach adopted by Nigeria could prove a useful model for the RBI to examine and emulate, keeping in mind the needs of those Indian citizens at the bottom of the financial totem pole.

Second, digital infrastructure continues to be a hurdle for adoption. As of December 2021, 666,000 individual and merchant wallets had been registered.[55] This remains a significant way off Nigeria's population of 20.61 crores. Moreover, with total transaction volume at only 34,000 transactions[56], there is still some way to go before the E-Naira becomes a dominant means of payment in Nigeria.

Conclusion

Ultimately, what is clear is that CBDCs, while potentially a helpful tool in achieving financial inclusion, are by no means a silver bullet solution. Particularly in a developing country such as India, where internet penetration presents a significant constraint, central banks and regulators must be realistic in what they hope to achieve through the introduction of a CBDC. However, this is not to say that a CBDC is not worth implementing - rather it is an acknowledgement of the fact that any strategy that looks to introduce a CBDC must also place significant emphasis on developing underlying internet and smartphone access to marginalised and vulnerable communities as well as enhancing digital literacy.

[55] Ayodele, 'CBN Says ENaira Has Completed N188 Million Worth of Transactions', *Nairametrics* (blog), 12 December 2021, https://nairametrics.com/2021/12/12/cbn-says-enaira-has-completed%e2%80%afn188-million-worth-of-transactions/.

[56] Ibid