Central Bank of Kenya

Discussion Paper on Central Bank Digital Currency

February 2022

CONTENTS

1. EXECUTIVE SUMMARY

Rapid technological innovation is ushering in a new era of public and private digital money. The transition to digital payments has been accelerated by the proliferation and easy access to mobile devices, as well as the emergence of Fintech firms that constantly innovate new products to run on these devices. New digital currencies have emerged to facilitate payment transactions. They include: Electronic Money (e-Money), Cryptocurrency,[1] Stable Coin,[2] and Central Bank Digital Currency (CBDC). CBDC is a digital currency issued by the central bank and intended to serve as legal tender.

Following the outbreak of the coronavirus (COVID-19) pandemic, digital platforms have emerged as important financial inclusion tools across the world. To reap the full benefits and manage risks, policymakers are looking to step up. Central banks are exploring the possibility of rolling out CBDC solutions to meet their future payments needs in a digital economy. According to a 2021 survey of central banks by the Bank for International Settlements (BIS), 86 percent of central banks are actively researching the potential for CBDCs, 60 percent were experimenting with the technology and 14 percent were deploying pilot projects.[3]

The Central Bank of Kenya (CBK) has been at the forefront of monitoring these developments. This is critical given that policy choices among central banks globally should reflect the specific jurisdiction requirements and circumstances at a point in time. This has informed the development of this discussion paper which is centred on the following key focus areas:

i) Kenya's Payments Landscape

National Payment Systems in Kenya are classified into two categories in terms of values and volumes processed:

a) **Large Value (Wholesale) Payment Systems** including the Kenya Electronic Payment and Settlement System (KEPSS), East African Payment System (EAPS), Regional Payment and Settlement System (REPSS) and Society for Worldwide Interbank Financial Telecommunication (SWIFT). These are used to process domestic large value payments, cross-border payments and remittances. While strides have been made to reduce the cost of cross border remittances in Kenya from over 15 percent in the last 10 years to 8.0 percent as at end of 2020, the cost is still beyond the Sustainable Development Goal of 3 percent by 2030.

b) **Low Value (Retail) Payment Systems**, which include mobile phone money transfer services/e-wallets, Automated Clearing House (ACH), card payments, Pesalink (inter-bank transfer). The Kenyan domestic payment landscape is comprised of public and private sector players, including CBK and Payment Service Providers (PSPs). The ecosystem is a mix of cash and digital currencies, including mobile money, which led to increased financial inclusion to 83.7 percent in 2021.[4] Kenya ranks third after Mongolia and China in financial inclusion out of 52 countries within emerging markets and developing economies.[5]

[1] This is a form of a privately issued digital asset based on a network that is distributed across a large number of computers.

[2] A stable coin is a crypto asset that aims to maintain a stable value relative to a specified asset, or a pool of assets. A Global Stable Coin (GSC) is a stable coin with a potential reach and adoption across multiple jurisdictions.

[3] https://www.bis.org/about/bisih/topics/cbdc.htm

[4] According to the CBK FinAccess report, 2021.

[5] Source: IMF Working Paper of 2021 on Measuring Digital Financial Inclusion in Emerging Market and Developing Economies: https://www.imf.org/-/media/Files/Publications/WP/2021/English/wpiea2021090-print-pdf.ashx

Globally, new technologies and innovations, including Distributed Ledger Technology (DLT), Decentralized Finance (De-Fi)[6] and embedded finance, are at early stages of implementation. CBK continues to monitor these developments closely to ensure Kenya's Payment System remains relevant and *fit for purpose*.

ii) CBDC: Opportunities and Risks

Central banks exploring CBDC issuance cite different objectives, including mitigating systemic risks, financial stability and payments resilience, enhanced cross border payments, customer protection, promoting innovation and financial inclusion.

Conversely, there are significant potential risks with CBDC issuance. These include financial exclusion, technology risks, competing with bank deposits and undermining bank intermediation, hampering monetary policy transmission, Anti-Money Laundering and Combating the Financing of Terrorism (AML/CFT) and data privacy balance and infrastructure costs.

iii) Overview of Other Jurisdictions' CBDC Projects

- **Bahamas' Sand Dollar:** The Sand Dollar project was launched in December 2019, by the Central Bank of Bahamas to provide a digital alternative to tackle the problems of physical cash distribution over geographically dispersed rural island communities.
- **Eastern Caribbean's DCash:** The Eastern Caribbean Central Bank (ECCB) issued DCash as a pilot to banks and approved non-bank financial institutions on a private permissioned blockchain network. Similar to the Sand Dollar, DCash aims to tackle difficulties in physical distribution of cash over ECCB's set of islands by providing a digital alternative.
- **Singapore's Project Ubin:** Monetary Authority of Singapore (MAS) has collaborated with other countries e.g. Canada and Thailand in experimenting CBDC cross-border payments.
- **Bank of England (BOE)** is exploring CBDC due to the decrease in use of banknotes in England and increase in the use of privately issued money and alternative payment methods.
- **Sweden's e-Krona:** In response to the decline in the usage of cash in Sweden, the Central Bank of Sweden is seeking to implement a retail digital currency.
- **Canada's Project Jasper:** The Bank of Canada's (BOC) current focus is on the retail use of a CBDC as a complement to banknotes, specifically as a contingency plan.
- **BIS' Project Dunbar:** In September 2021, the Bank for International Settlements (BIS) Innovation Hub, the Reserve Bank of Australia, Bank Negara Malaysia, Monetary Authority of Singapore, and South African Reserve Bank joined forces to test the use of CBDCs issued by multiple central banks for international settlements.
- **BIS' Project mBridge:** In September 2021, BIS reported that a prototype of multiple CBDCs (m-CBDCs) developed by BIS, Hong Kong Monetary Authority, Bank of Thailand, Central Bank of the UAE, and People's Bank of China, showed potential to shorten cross-border transaction time from 3-5 days to less than 10 seconds. Further, the platform cut the overall costs associated with international payments by half.

[6] Decentralized finance (De-Fi) is blockchain-based forms of finance that do not rely on centralized intermediaries such as banks.

- **China's digital Yuan:** China entered the next phase in its planned digital Yuan rollout, targeting to make digital Yuan available to international visitors during the 2022 Beijing Winter Olympics. China aims to utilize the 2022 Winter Olympics in Beijing to upscale digital Yuan trials.
- **Digital Turkish Lira:** The Central Bank of the Republic of Turkey (CBRT) has begun to develop a prototype for a Digital Turkish Lira and run pilot tests. The study will also explore the integration of blockchain technology into payment systems.
- **Singapore's assessment of a retail CBDC:** The Monetary Authority of Singapore (MAS) has been engaging in projects on wholesale CBDC solutions. In November 2021, MAS published its first assessment of the economic case for a retail CBDC in Singapore and its potential implications for financial stability and monetary policy.
- **Canada's evaluation of monetary sovereignty for CBDC:** In December 2021, Bank of Canada published its evaluation of the monetary sovereignty rationale of CBDCs. It assessed the consequences of currency substitution, key differences in monetary policy capabilities across currency-issuing countries and the risks of currency substitution.
- **The U.S. Federal Reserve research on CBDC:** In January 2022, the U.S. Federal Reserve published a discussion paper evaluating the costs and benefits of issuing CBDC, which is meant to solicit public views on the issuance of a U.S. CBDC.
- **India's digital Rupee:** During its annual budget presentation on February 1, 2022, India announced that it will launch a digital version of the rupee in 2022. The digital rupee is meant to boost India's digital economy.

iv) Applicability of CBDC in Kenya

a) Key elements for consideration

The fundamental principles require that the central bank issued currencies and private digital currencies should incorporate core features. These include ease of use, low transaction cost, convertibility, instant settlement, continuous availability and a high degree of security, resilience, flexibility and safety. As is with mobile money, the focus of CBDC innovation must be on functionality and the problem it resolves for the people rather than the underlying technology. Whilst CBDC offers opportunities to reduce costs associated with digital payments, it also comes with risks particularly related to cybersecurity and unknowns on how it would impact central banks' core functions of monetary policy, financial stability and payment systems oversight. The key elements to be considered by CBK before issuing a CBDC are legal and institutional preconditions. These would include infrastructure, regulatory and supervisory framework, governance and risk management, central bank resources, and central bank legislation.

b) Use case for a Kenyan CBDC

A CBDC issued by CBK would be a sovereign currency in an electronic form and it would appear as a liability on CBK's balance sheet and an asset to users holding it. The most valuable opportunities that encourage issuance would be where a CBDC can support CBK's public policy objectives.

The trend in Kenya's domestic payments indicate the existence of a digital currency (e-money) that is robust, inclusive and highly active. Therefore, the consideration to introduce a CBDC in the payments system in Kenya could target cost reduction, interoperability and enhancing cross-border payments. Existing proposals indicate that CBDC might hold the potential to achieve much needed interoperability. This paper assesses the applicability of CBDC in Kenya's retail space and cross-border payments:

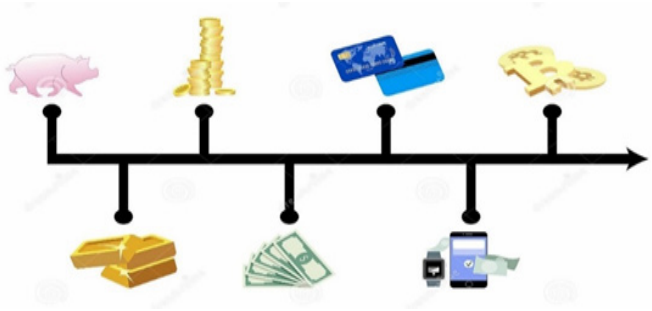
- ❒ **Retail Payments:** Interoperability of mobile wallets, implemented in 2018, is limited to only P2P payments and is yet to be expanded to both merchant and agent interoperability. CBDC may offer promise for this interoperability. Assuming the Central Bank charges no fees for CBDC, it would facilitate small-value online transactions given relatively low (or no) associated fees compared to the current payment charges. However, ultimately mobile payments have a huge potential for growth in Kenya, thereby limiting the opportunities that a CBDC would provide in retail payments. The key consideration is whether to provide CBDC for financial access or to promote financial inclusion more efficiently by ensuring availability of cheap, mobile phone financial services.
- ❒ **Cross-border Payments:** Cross-border payments are inherently more complex than purely domestic ones. As a result, they are often slow and expensive. While it is difficult to quantify the benefits, interoperable CBDCs may have the potential to lead to efficiency gains by flattening the multi-layered correspondent banking structure and shortening the payment chains. However, this might require all participating countries to have operational CBDCs.

Kenya's assessment of CBDCs must be focused on potential opportunities and risks. Fundamentally, given the wide-ranging implications of CBDC to the wider economy, any eventual decision to introduce a CBDC would involve the government, regulatory authorities, private sector and engagement with society more generally. CBK therefore welcomes comments on this discussion paper.

2. BACKGROUND

Modes of payments have evolved from ancient barter trade to the current forms of currencies as illustrated in Figure 1 below. The technology and innovation wave has brought about a paradigm shift in the way we handle money. There has been a significant shift from cash payments, towards card transactions and other electronic payment methods facilitated by mobile and web platforms. The transition to digital payments has been accelerated further by the proliferation and easy access to mobile devices, as well as the emergence of Fintech firms that constantly innovate new products to run on these devices.

Figure 1: The Evolution of Payments



Source: Coinpedia.org

The rapid technological innovation is ushering in a new era of public and private digital money. To reap the full benefits and manage risks, policymakers around the world are looking to step up, given the wide-ranging and profound implications of digital money. The fundamental principles require the central bank issued currencies and private digital currencies to incorporate core features: ease of use, low transaction cost, convertibility, instant settlement, continuous availability and a high degree of security, resilience, flexibility and safety.

New digital currencies have emerged to facilitate payment transactions. They include:

i. **Electronic Money (e-Money)** – This is an electronic store of monetary value on a technical device, such as a mobile phone device, that may be widely used for making payments to entities other than the e-money issuer. The device acts as a prepaid bearer instrument that does not necessarily involve bank accounts in transactions.
ii. **Cryptocurrency** – This is a form of a privately issued digital asset based on a network that is distributed across a large number of computers. Cryptocurrencies are not tied to the value of an asset like a sovereign currency and are therefore highly volatile and speculative. They seek to create value through some intrinsic mechanism to ensure scarcity, like mining process, or anonymity.
iii. **Stable Coin** – A stable coin is a crypto asset that aims to maintain a stable value relative to a specified asset, or a pool of assets. A Global Stable Coin (GSC) is a stable coin with a potential reach and adoption across multiple jurisdictions and the potential to achieve substantial volume.
iv. **Central Bank Digital Currencies (CBDC)** – This is a digital currency issued by the central bank and intended to serve as legal tender.

By transforming payments, digitalization has the potential to deliver greater value and convenience at a lower cost. Following the outbreak of the coronavirus (COVID-19) pandemic, digital platforms have emerged as important financial inclusion tools in Kenya and across the world.

Among the policymakers that are looking to step up are central banks across the globe in both advanced and developing economies. Central banks are exploring the possibility of rolling out CBDC solutions to meet their future payments needs in a digital economy. According to a 2021 survey of central banks conducted by the Bank for International Settlements (BIS), it was observed that 86 percent of central banks are actively researching the potential for CBDCs, 60 percent were experimenting with the technology and 14 percent were deploying pilot projects.[7]

The growing interest in the adoption of CBDC by various jurisdictions has been motivated by varying reasons, for example: -

- ☐ Central banks, faced with dwindling usage of paper currency, seeking to popularize a more acceptable electronic form of currency (like Sweden).
- ☐ Jurisdictions with significant physical cash usage seeking to make issuance more efficient (like Bahamas, Denmark, Germany).
- ☐ Central banks seeking to meet the public's need for digital currencies, manifested in the increasing use of private virtual currencies, and thereby avoid the more damaging consequences of such private currencies.

CBK has been at the forefront of monitoring these developments. This is critical given policy choices among central banks globally should reflect the specific jurisdiction requirements and circumstances at a point in time.

The basic question when assessing CBDC for a specific country is: what problem would a CBDC solve? To answer, we first need to define the term CBDC in detail and assess the current state of Kenya's payment system.

[7] https://www.bis.org/about/bisih/topics/cbdc.htm

3. WHAT IS CBDC?

3.1 Definition

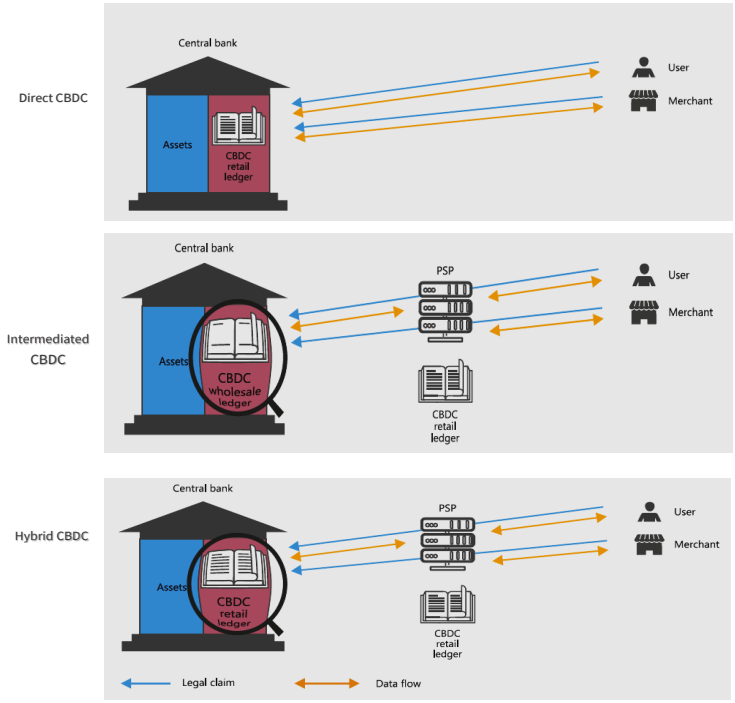
To define a CBDC, it is important to first understand what a digital currency is. A digital currency is a means of payment that exists purely in electronic form and can be exchanged for a pre-determined amount equivalent to the local fiat currency. A CBDC, therefore, is a digital currency issued by the central bank and intended to serve as legal tender. It is the same as a fiat currency and is exchangeable one-to-one with the fiat currency, only that it is in electronic form. As opposed to the other forms of electronic money issued by central banks, that is central bank reserves, CBDC designed for retail payments would be universally available.

In contrast, wholesale CBDC[8] would be available only to select institutions, mostly banks with accounts at the central bank.

3.2 CBDC architecture and high-level design

A CBDC solution can be designed to be technology agnostic and independent, provided that it delivers on the required functionality. Figure 2 below highlights the possible architectures behind a CBDC framework. These include: direct model, hybrid model and intermediated model. The architectures can run individually or concurrently, depending on the technical capacity and expectations of the jurisdiction.

Figure 2: The various CBDC Architectures



a) CBDC is a claim on the central bank.
Payment Information flows directly from users and merchants to the central bank.
The central bank maintan a full ledger of retail transactions.
Intermediaries or central bank onboard (KYC)

b) CBDC is a claim on the central bank.
The central bank has a wholesale ledger of only payments between Payment Service Providers (PSP), not those between the individual users.
Intermediaries onboard clients and execute retail payments.

c) CBDC is a claim on the central bank.
The central bank retains a copy of the full retail ledger.
Intermediaries onboard clients and handle retail payments.

Source: BIS – Central banks facing pandexit challenges.

[8] A retail CBDC is one that will be issued for the general public. Retail CBDC based on Distributed Ledger Technology (DLT) has the features of anonymity, traceability, availability 24 hours a day and 365 days a year, and the feasibility of an interest rate application.
A wholesale CBDC is for financial institutions that hold reserve deposits with a central bank. It could be used to improve payments and securities settlement efficiency, as well as to reduce counterparty credit and liquidity risks.

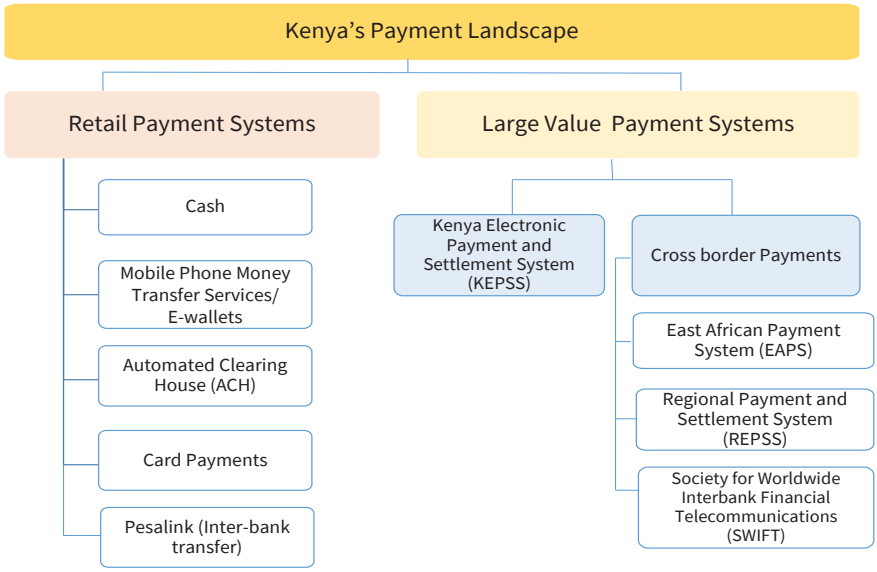
4. OVERVIEW OF KENYA'S PAYMENTS LANDSCAPE

Existing proposals for CBDC suggest that it is mainly considered a means of payment. This section assesses the evolution and current state of Kenya's payment system.

A payments system refers to an arrangement that enables payments to be effected between a payer and a beneficiary. It facilitates the circulation of money, and includes any instruments and procedures that relate to the system. National Payment Systems are the conduits through which buyers and sellers of financial products and services make transactions and are an important component of the country's financial system. In Kenya, the payment system participants comprise CBK, the Government, Commercial Banks, other Financial Institutions and Payment Service Providers.

National Payment Systems in Kenya are classified into two categories; Large Value (Wholesale) and Low Value (Retail) Payment Systems, as illustrated in figure 3. The classification is based on the throughput in terms of values and volumes processed.

Figure 3: Kenya's Payment Landscape



Source: CBK

4.1 The role of the Central Bank of Kenya in payments

The Constitution of Kenya (2010) and the Central Bank of Kenya Act (2015) establish the Central Bank of Kenya (CBK) as the monetary authority of Kenya. As such, CBK is responsible for formulating monetary policy to achieve and maintain price stability. CBK also promotes financial stability; an effective and efficient payment, clearing and settlement system; formulates and implements foreign exchange policies; holds and manages foreign exchange reserves; issues currency; licenses and provides oversight over Payment Service Providers (PSPs); and is the banker for, adviser to and fiscal agent of the Government of Kenya.

4.2 Current status of Kenya's payment landscape

Early use of currency in Kenya as a means of payment commenced with the Arab influence who were among the first to use currency as we know it. Penetration of coins and notes accelerated when construction of the railway commenced in Mombasa in 1896 to reach Port Florence – present day Kisumu – in 1901. After the World War I in 1919, the East African Currency Board (EACB) was introduced in the East African region with the responsibility of providing currency. As the East African territories became independent in sequence from 1962, the EACB ceased to issue notes. With the establishment of individual Central Banks for the East African countries, Kenya began printing and minting its own currency in 1966, under the mandate given to the Central Bank of Kenya in the Central Bank of Kenya Act cap 491.[9]

The current forms of payment in Kenya can be traced back to 1966, when banknotes from the CBK were legalised. The initial issue of Kenya shilling notes were in the denominations of 5, 10, 20, 50 and 100 shillings. Later came the introduction of bank notes and coins in the current denominations. These notes and coins are issued by the CBK and used as a means of payment by the public. The entrance of indigenous banks in 1968, popularised bank deposits as a store of money. Later, bank to bank transfers would now be used as a means of digital payments. The emergence of banks also came with the introduction of payment cards (debit, credit and prepaid cards) as a payment channel.

Mobile money emerged in 2007, through M-Pesa.[10] Its rapid acceptance rate depicted a receptive attitude by Kenyans towards innovative payment channels. This led to the emergence of other private mobile money providers. Today, the reliance on cash and mobile money remains the most significant in Kenya's payment ecosystem especially in retail payments.

i) Retail payments

The Kenyan domestic payment landscape is comprised of public and private sector players, including CBK and Payment Service Providers (PSPs). The ecosystem is a mix of cash and digital currencies. Mobile money, provided by PSPs, is highly active as a digital currency.

The Global Competitiveness Report, 2019, by World Economic Forum (WEF) ranks Kenya as the 27th country in mobile-cellular telephone subscriptions.[11] According to the CBK FinAccess report, 2021,[12] just under half of the domestic remittances and over 30 per cent of bill payments are made via mobile money.

Kenya ranks third after Mongolia and China in financial inclusion out of 52 countries within emerging markets and developing economies. The digital financial inclusion index (financial inclusion through fintech) is higher than the traditional financial inclusion index (financial inclusion through financial institutions such as banks)[13] . According to the CBK FinAccess report,

[9] https://www.centralbank.go.ke/currency-history/

[10] M-Pesa ("M" for mobile and "Pesa" for money in Kiswahili) was launched in 2007 as a Person to Person (P2P) mobile money transfer service. It aimed to serve a need to transfer money from urban workers back to their families in the rural areas. These P2P transfers are supported by a network of agents who facilitate cash withdrawals and cashing deposits.

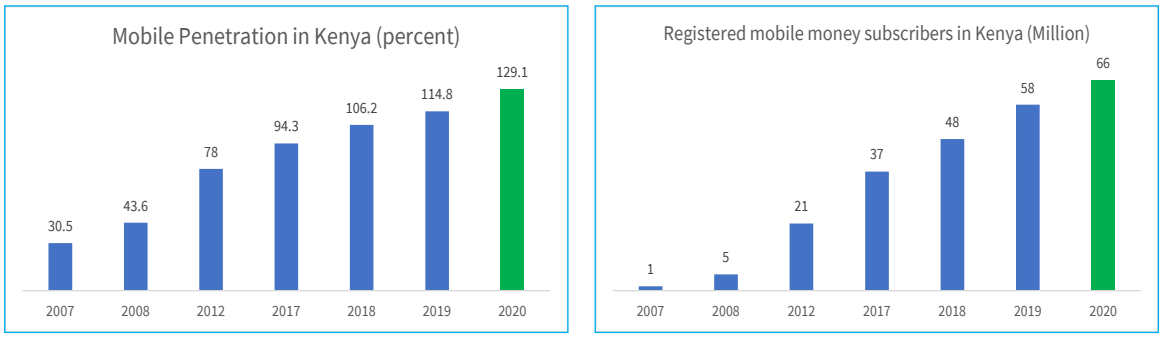
[11] http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

[12] https://www.centralbank.go.ke/wp-content/uploads/2021/12/SurveyReport.pdf

[13] Source: IMF Working Paper of 2021 on Measuring Digital Financial Inclusion in Emerging Market and Developing Economies: https://www.imf.org/-/media/Files/Publications/WP/2021/English/wpiea2021090-print-pdf.ashx

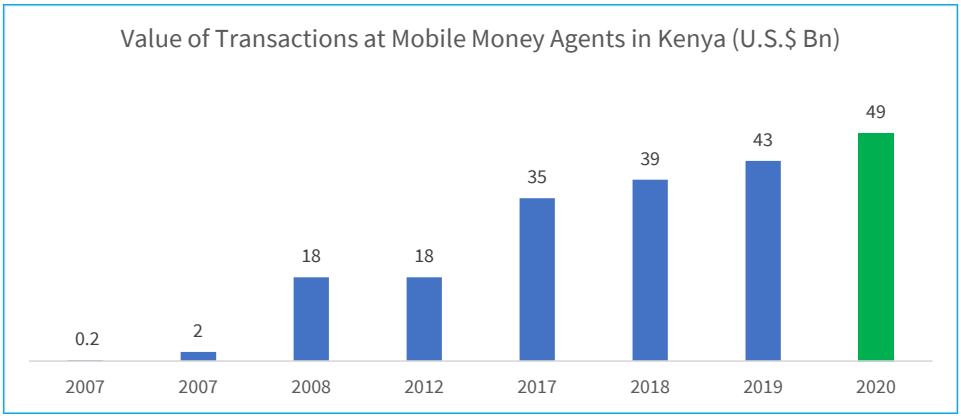
2021, Kenya has a population of 47.6 million people. In 2021, the financial inclusion was 83 percent from 26 percent in 2006. Mobile money has been credited for the growth in financial inclusion. In 2020, the mobile penetration in Kenya was 129.1 percent[14].

As of May 2021, there were 67.77 million registered mobile money accounts. 79 percent of adults have a mobile money account compared to 40 percent of adults who have a bank account.



Source: Bank Supervision Annual Report 2020 by CBK

In the COVID-19 era, mobile transactions, as a share of total transactions, increased from 55.7 percent to 79.6 percent . Overall, in March 2021, digital transactions accounted for 81.5 percent and 38.6 percent in number and value respectively. These numbers have continued to grow due to the accelerated digitalization during this COVID-19 era. This is also attributable to the mobile money mitigation measures introduced by CBK to shield the public against the shocks of the COVID-19 pandemic.



Source: CBK's National Payment Systems

Mobile payment is complimented by card transactions in the digital payments' realm in Kenya. In 2020, card payments amounted to USD6.5 billion, a significant share of all payment transactions[16].

[14] https://www.centralbank.go.ke/uploads/banking_sector_annual_reports/468154612_2020%20Annual%20Report.pdf.
[15] https://www.centralbank.go.ke/uploads/monetary_policy_reports/746986997_26thMPC2021.pdf
[16] https://www.centralbank.go.ke/national-payments-system/payment-cards/value-of-transactions-ksh-millions/

The digital 'rails' have been integrated with households and the economy to the last mile. For instance, the penetration of mobile payments enabled the vulnerable to receive their monthly stipend of USD20 through their mobile phone in the national payment programme for the 70 years and above (Inua Jamii 70+ programme[17]). The potential for growth remains high, given the 129 percent penetration of mobile subscriptions. This is an indication of the inclusivity of Kenya's digital money ecosystem.

ii) Large value payments

Domestic large value payments in Kenya are processed through Kenya Electronic Payment and Settlement System (KEPSS). This is a Real Time Gross Settlement (RTGS) system, where transactions are cleared and settled on a continuous basis. The real time transfers settled through KEPSS are debited and credited in the commercial banks' accounts held at CBK, where the banks hold cash reserves. Throughout the day, the commercial banks transfer funds between their accounts dependent upon their customers' RTGS payment instructions. In 2020, KEPSS processed about 5.3 million RTGS payments amounting to USD330 billion[18].

iii) Cross-border payments

Cross-border payments are financial transactions where the payer and the recipient are based in separate countries. They cover both wholesale and retail payments, including remittances. Cross-border payments remain an important contributor to the country's growth and development. For instance, remittance inflows continue to provide a stable source of foreign exchange for Kenya and a key support for many households, totaling USD3,717 million in 2021[19]. This was an increase of 20.2 percent from 2020.

Regionally, the need to enhance efficiency in cross-border payments within the East African Community (EAC) and Common Market for East and South Africa (COMESA) regions resulted in the development of two regional payment systems; East African Payment System (EAPS)[20] and the Regional Payment and Settlement System (REPSS). Both systems are integrated in the Kenya Electronic Payment and Settlement System (KEPSS). Kenya dominates in volume of transactions in the EAPS. In 2020, CBK processed 28,411 EAPS and 906 REPSS payments, worth about USD 460 million and USD 76 million equivalent, respectively[21].

The increased international mobility of goods and services, capital and people has contributed to the growing economic importance of cross-border payments. However, cross-border payments lag domestic ones in terms of cost, speed, access and transparency. The Sustainable Development Goals (SDGs) set a target for the cost of remittances of less than 3 percent by 2030. The cost in Sub-Saharan Africa at end 2020 stood at 8.2 percent, while in Kenya this stood at 8.0 percent.

[17] The Inua Jamii Senior Citizens' Scheme is a Government social pension program offering universal pension coverage for all citizens of Kenya once they reach 70 years of age.
[18] Source: Central Bank of Kenya (CBK)
[19] Source: Central Bank of Kenya (CBK)
[20] East Africa Payment System (EAPS) is a funds transfer mechanism used to transfer money from one bank to another across the border within the East African Community countries of Kenya, Rwanda, Tanzania and Uganda. Transactions are carried out in the EAC local currencies. It was established in 2014.
[21] Ibid., 10.

This cost has come down significantly over the last 10 years from over 15 percent. Kenya has seen the adoption of technology and innovation bring down the costs significantly. This has also been facilitated by the multiplicity of remittance channels and products provided by banks and Money Remittance Providers (MRPs). The integration of mobile phone financial services in the remittance's ecosystem has also lowered costs but more importantly allowed for smaller "bite-sized" remittance tickets. While the progress is commendable, a lot more remains to be done to achieve efficient cross-border payments at low or no cost.

iii) Moving forward

The payments landscape has dramatically changed over the last few years particularly during the COVID-19 period. New technologies and innovations, including Distributed Ledger Technology (DLT), Decentralized Finance (De-Fi)[22] and embedded finance, are at early stages of implementation. Their proponents indicate that they present potential opportunities to transform the payments landscape enhancing access, efficiency, convenience and lowering costs. CBK continues to monitor these developments closely to ensure Kenya's Payment System remains relevant and *fit for purpose.*

5. CBDC OPPORTUNITIES AND RISKS

The CBDC might slightly differ in structure and architecture from other forms of digital currencies, but it certainly stands out from the rest in terms of the issuer of the currency. CBDCs are issued solely by a central bank.

5.1 Opportunities

There exist diverse motivations driving central banks' interests in CBDC. Proponents of CBDC have highlighted benefits such as:

i. *Financial stability and payments resilience:* A CBDC could enhance financial stability in a jurisdiction by contributing to resilience in payments. By providing a new method of making payments, a CBDC could diversify the range of payments options.

ii. *Mitigating systemic risks:* A CBDC could make the financial system safer by allowing individuals, private sector companies and non-bank financial institutions to settle directly in central bank money, rather than bank deposits. This would significantly reduce the concentration of liquidity and credit risk in payment systems. This in turn reduces the systemic importance of large banks and PSPs. However, the central bank would enter into direct competition with the banks and PSPs it regulates. This could potentially trigger scrutiny on the existing regulatory frameworks.

iii. *Enhanced cross-border payments:* A CBDC could facilitate enhanced cross-border payments through regional and global integration and cooperation. This can be done through designing domestic CBDCs around a common set of standards to support interoperability, or through the development of international payment infrastructures. In September 2021, BIS reported that a prototype of multiple CBDCs developed by BIS, Hong Kong Monetary Authority, Bank of

[21] Decentralized finance (De-Fi) is blockchain-based forms of finance that do not rely on centralized intermediaries such as banks.

Thailand, Central Bank of the UAE, and People's Bank of China, showed potential to shorten cross-border transaction time from 3-5 days to less than 10 seconds. Further, the platform cut the overall costs associated with international payments by half. However, scalability issues with DLT and lack of liquidity savings mechanisms, were highlighted as major limitations[23].

iv. *Consumer protection:* The growing interest in cryptocurrencies indicates increased demand for internet-native financial services. People want to transact in a borderless environment. CBDC could potentially shield the public from the risk of new forms of private money by providing safer and more trustworthy payment services than new forms of privately issued money-like instruments, such as stable coins.

v. *Promoting innovation:* An open CBDC platform could allow a range of firms to innovate around CBDC-related payment services and also be able to re-innovate the payment services they provide to consumers.

vi. *Financial inclusion:* CBDC is a "double-edged sword" in relation to financial inclusion. A retail CBDC may be introduced to give those financially excluded in the current ecosystem access to a digital payments channel. However, users would require access to the underlying technology and the technical know-how, which could be a constraint for some individuals, ultimately excluding them. However, there is potential for CBDC to enable the marginalized areas in the country to access a digital payments channel. This would require penetration of CBDC infrastructure in areas that have been marginalized by the private payment providers due to lack of market attraction.

5.2 Risks

While CBDCs could potentially have a significant positive impact on the financial system, it presents challenges and risks:

i. *Disintermediating banks:* If significant deposit balances are moved from bank deposits to CBDC, banks' ability for credit creation could get constrained. Since central banks cannot provide credit to the private sector, the impact on the role of bank credit needs to be well understood. Further, as banks lose a significant volume of low-cost transaction deposits, their interest margin might come under stress leading to an increase in the cost of credit. However, these could potentially be mitigated by an instance where the CBDC is not interest bearing. Therefore, the public would be motivated to hold money in interest bearing bank deposits. Research on retail CBDCs by BIS together with seven central banks also found that, while a significant shift from deposits to CBDCs can pose risks to financial stability, this could be controlled if the banking sector is given sufficient time and flexibility to adjust[24].

ii. *Financial exclusion:* As highlighted earlier, CBDC can lead to financial exclusion if the required technological infrastructure and technical literacy is not accessible to all sections of the public. For Kenyans to access CBDC, they would require access to the underlying technology and the user know-how, which could be a constraint for some individuals.

[23] https://www.bis.org/publ/othp40.pdf
[24] https://www.bis.org/press/p210930.htm

iii. *Monetary policy:* CBDC, supplied in the same way as banknotes, would potentially have minimal implications on the implementation of monetary policy. Fundamentally, central banks would remain the monopoly supplier of reserves, cash and CBDC, and therefore continue to set related terms and conditions of these instruments and control monetary policy[25]. However, CBDCs may bring about significant changes in the behavior of the holding public and therefore trigger a review of the monetary policy framework.

iv. *Technology risks:* CBDC infrastructure could present an appealing target for cyberattacks and other security threats including data privacy issues. Further, in countries with lower financial literacy levels, the increase in digital payment related fraud may also spread to CBDCs.

v. *AML/CFT and Data Privacy balance:* At one extreme, CBDC could be designed requiring CBDC holders to provide the central bank with detailed information about themselves and their transactions. This approach would minimize money-laundering risks but would raise significant privacy concerns. At the other extreme, a CBDC could be designed allowing parties to transact on a fully anonymized basis. This approach would address privacy concerns but would raise significant money-laundering risks.

vi. *Infrastructure Cost:* CBDC has the potential to reduce the cost of printing money. However, it introduces the production costs (fixed and variable) of running CBDC infrastructure.

5.3 Overview of other jurisdictions' motivation

Different jurisdictions have been motivated by different reasons to research and pilot the introduction of CBDC including to enhance efficiency of payment systems, reduce risks in payment systems, access to financial services (financial inclusion) and enhance cross-border payments. This is particularly important given that Kenya's assessment of CBDC must be focused on opportunities and risks specific to Kenya. This section reviews CBDC projects conducted by several jurisdictions.

5.3.1 Bahamas Sand Dollar

Bahamas has a dispersed geography, with pockets of sparse populations and many rural island communities who have limited or no access to physical modes of delivery. The services are only available through electronic channels. Moreover, the banks' branch network has been scaled down in response to the rising operational costs. As of 2017, around 90 percent of the Bahamian population had smartphones with mobile wallet capabilities. Bahamas targeted an upgrade of the infrastructure for the payments system. This triggered the launch of the pilot phase of the Sand Dollar project in December 2019, by the Central Bank of Bahamas. The project started with very little activity on digital and mobile payments with the CBDC viewed as the glue that would connect these payment systems together.

5.3.2 Singapore's Project Ubin

Singapore has advanced payment systems and majority of the population is served by banks. Smartphone penetration is high in Singapore, at 78 percent. This is supported by excellent mobile

[25] https://www.bankofcanada.ca/wp-content/uploads/2017/11/sdp2017-16.pdf

and fixed internet infrastructure. At 91 percent coverage across the city-state, Singapore has one of the world's highest internet penetration rates. However, the Monetary Authority of Singapore (MAS) determined that an international settlement network could enable faster and cheaper transactions than conventional cross-border payments channels. MAS therefore began Project Ubin[26] . The project explored the development of the multi-currency payments model using CBDCs. Under this project, MAS has collaborated with other countries e.g. Canada and Thailand in experimenting CBDC cross-border payments.

5.3.3 Eastern Caribbean's DCash

In a dispersed set of island economies distributed over many square miles of ocean, distribution and management of cash becomes an enormous challenge in Eastern Caribbean islands. This is despite people without bank accounts, credit or debit cards having to rely on cash for payment. The Eastern Caribbean Central Bank (ECCB) plans to reduce the usage of cash and leverage fintech[27] . The penetration rates for internet usage and mobile telephones have improved, with the share of individuals using the internet moving from just 5.6 percent in 2000 to 59.8 percent in 2019[28]. In March 2021, the ECCB issued DCash as a pilot to banks and approved non-bank financial institutions on a private permissioned blockchain network. The overall goal is to help build resilience into the financial system and promote financial inclusion for citizens in the Eastern Caribbean Currency Union[29].

5.3.4 Bank of England

The Bank of England's (BOE) is exploring the concept of CBDC given that the use of banknotes is falling in England while the use of privately issued money and alternative payment methods is rising[30] . BOE aims to provide an alternative to the privately issued digital money, that is safer and most trusted form of money to households, businesses and the financial system. BOE, through its CBDC discussion paper in June 2021, invited feedback and ideas from the public to facilitate the assessment of CBDC for future deployment.

5.3.5 Sweden's e-Krona

Sweden is one of the most advanced digital economies in the word. The use of cash in Sweden has declined significantly over the past decade, leading to concerns about access to state-backed money and the safety and efficiency of the domestic payments system. According to Riksbank (the Central Bank of Sweden), 90 percent of all payments are made through digital channels in Sweden. Further, most of the payments in Sweden are done through third-party PSPs like Swish. Nearly 80 percent of the Swedish population used Swish for payments[31]. In response, Sweden is seeking to implement a retail digital currency to replace Swish, a digital payment application developed by 6 Swedish banks. This will aim to avert systemic risks while also asserting the sovereignty of the central bank's currency.

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[26] https://www.mas.gov.sg/schemes-and-initiatives/Project-Ubin

[27] https://www.eccb-centralbank.org/files/documents/Stategic_Plan/ECCB_Stategic_Plan_2017P2.compressed.pdf

[28] https://www.eccbcentralbank.org/files/Growth%20and%20Resilience%20Dialogues/5th%20Growth%20and%20Resilience/Background%20Paper%20-%20Justin%20Ram.pdf

[29] Countries in the Eastern Caribbean Currency Union include: Anguilla, Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Kitts and Nevis, Saint Lucia and Saint Vincent and the Grenadines.

[30] https://www.bankofengland.co.uk/paper/2021/new-forms-of-digital-money

[31] https://www.riksbank.se/globalassets/media/rapporter/pov/engelska/2020/economic-review-2-2020.pdf.

5.3.6 Canada's Project Jasper

The Bank of Canada's (BOC) current focus is on the retail use of a CBDC as a complement to banknotes. The CBDC is being developed as a contingency plan, recognizing that any solution would require significant time to design and deploy[32]. BOC has identified two possible reasons for the contingent effort; the rise of alternative digital currencies and the decline in the usage of cash.

5.3.7 BIS' Project Dunbar

In September 2021, the Bank for International Settlements Innovation Hub, the Reserve Bank of Australia, Bank Negara Malaysia, Monetary Authority of Singapore, and South African Reserve Bank joined forces to test the use of CBDCs issued by multiple central banks, for international settlements. Project Dunbar aims to develop prototypes for shared multi-CBDC platforms that will allow financial institutions to transact directly with each other in the digital currencies issued by participating central banks, eliminating the need for intermediaries and cutting the time and cost of transactions[33]. The results are expected to be released in early 2022.

5.3.8 Singapore's Global CBDC Challenge 2021

On June 28, 2021, MAS launched the Global CBDC Challenge[34] in partnership with the IMF, the World Bank, and other international organizations. The challenge aimed to catalyse development of technologies to enable issuance of retail CBDC. An independent panel of judges, including CBK, selected the top 15 finalists out of 300 submissions received. The 15 finalists were advanced into an Accelerator Program, where solutions to address key retail CBDC issues regarding accessibility, interoperability, and risk mitigation will be further developed. The 15 finalists presented their innovation to a global panel of judges that included CBK. Their innovations sought to address multiple problem statements through a variety of technology approaches including hardware wallets, digital identity and asset tokenization solutions. CBK's participation in the judging panel offered input on potential benefits and risks of CBDC.

5.3.9 China's digital Yuan

In 2017, People's Bank of China (PBOC) began developing and testing a digital fiat currency – digital Yuan. Digital Yuan is a retail CBDC issued to the public, aimed at modernizing domestic payment system in China to meet the public's daily payment needs, further improve the efficiency of the retail payment system and reduce the cost of retail payment. In September 2021, China entered the next phase in its planned digital Yuan rollout, targeting to make digital Yuan available to international visitors during the 2022 Beijing Winter Olympics. China aims to utilize the 2022 Winter Olympics in Beijing to upscale digital Yuan trials. Overseas athletes and visitors are expected to have access to digital Yuan throughout the event[35].

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[32] https://www.payments.ca/sites/default/files/paymentscanada_centralbankdigitalcurrency_thefundamentals_2020

[33] https://www.bis.org/press/p210902.htm

[34] On June 28, 2021, MAS in partnership with the International Monetary Fund (IMF), the World Bank, and other international organizations launched a global challenge for retail Central Bank Digital Currencies (CBDCs) solutions.
Source: https://tribex.co/wp-content/uploads/2021/06/Global_CBDC_Challenge_Problem_Statements.pdf

[30] https://www.bankofengland.co.uk/paper/2021/new-forms-of-digital-money

[35] http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4342636/index.html

5.3.10 Digital Turkish Lira

The Central Bank of the Republic of Turkey (CBRT) has begun to develop a prototype for a Digital Turkish Lira and run pilot tests. The study will also explore the integration of blockchain technology into payment systems. The CBRT stressed that the pilot project is experimental and does not signal any intention to issue a digital Turkish Lira. The results are set to be released in early 2022.

5.3.11 Singapore's evaluation of retail CBDC

The Monetary Authority of Singapore (MAS) has been engaging in projects on wholesale CBDC solutions. In November 2021, MAS published its first assessment of the economic case for a retail CBDC in Singapore and its potential implications for financial stability and monetary policy. MAS' strategic approach towards a retail CBDC for Singapore acknowledges the dynamic nature of the payment landscape, evolving public preferences and the potential of nascent technology solutions. MAS assesses that a retail CBDC that is elastically supplied and universally accessible just like cash is today could impact credit creation and, more broadly, financial and monetary stability in Singapore[36].

5.3.12 Canada's evaluation of monetary sovereignty for CBDC

In December 2021, Bank of Canada published its evaluation of the monetary sovereignty rationale of CBDCs. It assessed the consequences of currency substitution, key differences in monetary policy capabilities across currency-issuing countries and the risks of currency substitution. The report notes that authorities assessing CBDCs will have to consider not only domestic needs but also the international effects of their policies and how to coordinate with other jurisdictions to avoid arbitrage and increased fragmentation of the global monetary system[37].

5.3.13 The U.S. Federal Reserve research on CBDC

In January 2022, the U.S. Federal Reserve published a discussion paper evaluating the costs and benefits of issuing CBDC, which is meant to solicit public views on the issuance of a U.S. CBDC. The U.S. Federal Reserve's initial analysis suggests that a potential U.S. CBDC would best serve the needs of the United States by being privacy-protected, intermediated, widely transferable, and identity-verified. The assessment notes that while a CBDC could provide a safe, faster and digital payment option for households and businesses as the payments system continues to evolve, there may also be downsides. They include how to ensure a CBDC would preserve monetary and financial stability as well as complement existing means of payment[38].

More details on these jurisdictions' CBDC projects is captured in **Annex I**.

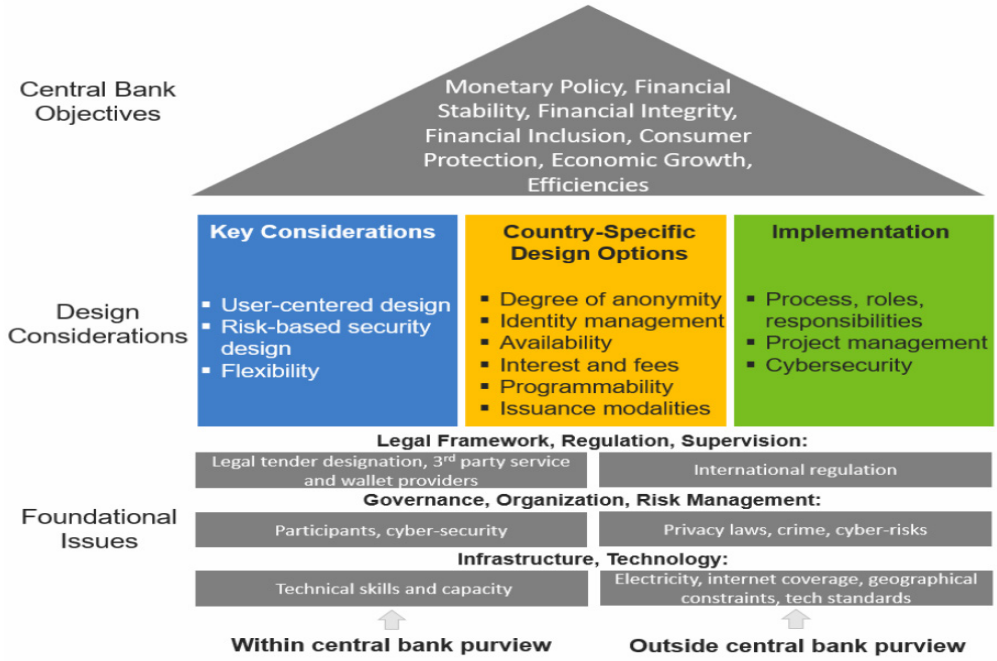
[36] https://www.mas.gov.sg/publications/monographs-or-information-paper/2021/retail-cbdc-paper
[37] https://www.bankofcanada.ca/2021/12/staff-discussion-paper-2021-17/
[38] https://www.federalreserve.gov/publications/money-and-payments-discussion-paper.htm

6. APPLICABILITY OF CBDC IN KENYA

6.1 Key elements for consideration

There are no universally applicable best practices or prescribed rules that will guarantee the ultimate success of CBDC issuance. However, a maturity assessment as illustrated in Figure 4 could guide the Central Bank in the decision-making process.

Figure 4: Key elements for consideration in CBDC design



Source: IMF - A Survey of Research on Retail Central Bank Digital Currency.

Before issuing CBDC, CBK would need to carefully review the legal and institutional preconditions. These would include infrastructure, regulatory and supervisory framework, governance and risk management, central bank resources, and central bank legislation.

Developing the needed infrastructure to support CBDC issuance would include ensuring a high level of availability and resilience of the general infrastructure such as electricity grids, mobile network and internet coverage. Ultimately, CBDC issuance is best considered in the broader context of national payment systems development, and driven by needs, objectives, and capacity rather than technology.[39]

6.2 Use case for a Kenyan CBDC

A CBDC issued by CBK would be a sovereign currency in an electronic form and it would appear as a liability on CBK's balance sheet and an asset to users holding it. The underlying technology, form and use of a CBDC would need to be designed to meet specific/identified needs of consumers. The technicalities would need to be thought through beyond the current theoretical aspects. Considering the payments landscape in Kenya as discussed in above sections, the existing

[39] https://www.imf.org/en/Publications/WP/Issues/2020/06/26/A-Survey-of-Research-on-Retail-Central-Bank-Digital-Currency-49517

currencies, the highly active/robust digital payment rails domestically and the overall financial ecosystem, the use case for a CBDC would need to be well defined.

The decision to embark on issuing a CBDC requires assessing the value of opportunities, balanced against any/all risks. The most valuable opportunities that encourage issuance would be where a CBDC can support CBK's public policy objectives. Other opportunities abound e.g. reducing illegal activity, facilitating fiscal transfers or enabling programmable money would be secondary considerations.[40]

The trend in Kenya's domestic payments indicate the existence of a digital currency (e-money) that is robust, inclusive and highly active. Therefore, the consideration to introduce a CBDC in the payments system in Kenya would not majorly focus on enhancing access to financial services given the existing and growing penetration of mobile money. The consideration could however target cost reduction, interoperability and enhancing cross-border payments. Looking to the horizon, it will be critical to connect our payment systems across the region and globally. Existing proposals indicate that CBDC might hold the potential to achieve this interoperability. The following section discusses the applicability of CBDC in:

i) Retail Payments

Unlike formative years when mobile money platforms were largely used for person-to-person (P2P) cash transfers, they are now increasingly being used to initiate and settle business deals such as the purchase of goods and services as well as the processing of instant short-term credit.

Though the industry moved to enable interoperability of mobile wallets in 2018, this is limited to only P2P payments and is yet to be expanded to both merchant and agent interoperability and even to work seamlessly for P2P. CBDC may offer promise for this interoperability. According to a report of September 30, 2021, on retail CBDCs research by BIS and a group of seven central banks[41], public-private collaboration will be essential to achieve interoperability between CBDC and other domestic payment systems. Assuming the Central Bank charges no fees for CBDC, it would facilitate small-value online transactions given relatively low (or no) associated fees compared to the current payment charges.

However, ultimately mobile payment has a huge potential for growth in Kenya, given the high mobile subscription, thereby limiting the opportunities that a CBDC would provide in retail payments. There have been proposals that a CBDC would improve access to digital payments for people who are currently financially excluded. This is a worthwhile goal. However, given the 132 percent penetration of mobile subscription in Kenya, would we rather promote financial inclusion more efficiently by taking steps to ensure that the provision of affordable, mobile phone financial services is made more available to people for whom the current cost is burdensome?

ii) Cross-border Payments

Cross-border payments are inherently more complex than purely domestic ones. They involve more, and in some cases numerous, players, time zones, jurisdictions and regulations. As a result,

[40] https://www.bis.org/publ/othp33.pdf

[41] Canada, England, Japan, the US, Sweden, Switzerland, and the European Central Bank. Source: https://www.bis.org/press/p210930.htm

they are often slow and expensive. Technological innovations in cross-border payments have been limited and evolve slowly compared to domestic payments. Hence, while it is difficult to quantify the benefits, CBDCs may have the potential to lead to efficiency gains by flattening the multi-layered correspondent banking structure and shortening the payment chains.

For instance, the East Africa Payment System (EAPS) has experienced difficulties in the funding model where participants source other East African Countries (EAC) currencies from the market thereby facing the unavailability of partner countries' currencies in the local market. An interoperable CBDC (i.e. one that is broadly compatible with others) could play a role in improving cross-border payments. However, in considering the feasibility of this proposal, would all participating countries be required to have operational CBDCs? As noted in a report on CBDC by the International Monetary Fund (IMF) in 2020, "it would seem prudent for central banks to consider coordinating their CBDC efforts closely and introducing sufficient flexibility into their CBDC designs to facilitate cross-border interoperability and standardization across CBDC implementations[42].

There are various factors that would need to be assessed critically when evaluating the applicability of CBDC in Kenya, in addition to risks highlighted earlier in this paper. Launching a CBDC is a multidimensional undertaking that extends beyond CBK's normal financial innovation policy frameworks. Issuing a CBDC will require national and international consultations. A CBDC could potentially lead to major disruptions affecting monetary policy transmission, financial stability, financial sector intermediation, the exchange rate channel, and the operation of the payment system.

7. CONCLUSION

It is quite apparent that CBDCs are receiving more attention than ever before. However, a key point to note is that despite the traction in attention, the motivations for the issuance of CBDCs vary across countries, as do the policy approaches and technical designs. Further, CBDC design and the potential benefits of a Kenyan CBDC remain unclear, similar to many jurisdictions across the world. Issuing a CBDC could also pose considerable risks.

Over the years, CBK has undertaken a test-and-learn methodology to create a conducive environment for innovation in Kenya. This has been primarily influenced by CBK's philosophy towards innovation that seeks to maximise opportunities while minimising risks. In light of the varied motivations towards the uptake of CBDCs, CBK's perspective is influenced by the following key questions:

- ☐ What problem/need does CBDC solve/meet for Kenyan citizens?
- ☐ Would there be an applicable use case for CBDCs in retail or wholesale payment systems?
- ☐ What would the role of CBDC be in developing countries?

In its pursuit to address the aforementioned questions, CBK reiterates that people must be at the centre of assessing any innovation. The usefulness of technology does not lie in its uniqueness but in its ability to solve a pressing societal problem. A case in point has been the rise of mobile money in Kenya that has placed our country as a cradle of innovation in Africa. Mobile money addressed the challenge of individuals transferring money to family members, primarily from the urban areas to their loved ones in the rural areas. Its applicability was further affirmed by the fact that mobile money

[42] https://www.elibrary.imf.org/view/journals/001/2020/104/article-A001-en.xml

enabled convenience, facilitated faster settlement, enhanced security of transfers and was affordable. As is with mobile money, the focus of the assessment of CBDC innovation must be on functionality and the problem it resolves for the people rather than the underlying technology. Whilst CBDC offers opportunities to reduce costs associated with digital payments, it also comes with risks particularly related to cybersecurity and unknowns on how it would impact central banks' core functions of monetary policy, financial stability and payment systems oversight. Further, in the case of Kenya where electronic money has taken root, the proposed value solution offered by CBDC seems to be already met.

A key opportunity where CBK sees potential value is the use of CBDC in facilitating cross-border transactions. As aforementioned in this paper, cross-border payments have technologically evolved more slowly than domestic transactions. Currently, international currency transactions are expensive and individuals are charged high fees to move funds from one country to another, especially when it involves currency conversions. CBDC could positively disrupt the cross-border market by making it more efficient and less costly. However, there are also the aforementioned risks that CBDC would introduce. We would therefore need to explore how to mitigate them in view of the benefits. This is an area that CBK is closely monitoring and exploring in collaboration with other central banks.

Fundamentally, given the wide-ranging implications of CBDC to the wider economy, any eventual decision to introduce a CBDC would involve the government, regulatory authorities, private sector and engagement with society more generally.

8. CALL FOR COMMENTS

As policymakers, our objectives for regulation have not changed. CBK remains committed to enhancing market confidence and safeguarding the stability of the financial system.

This discussion paper is part of CBK's initiatives to ensure informed policy review regarding financial sector innovations. CBK invites the public, industry and stakeholders to review this discussion paper on CBDC and provide feedback and ideas to be considered when assessing the use case for CBDC in Kenya. CBK has provided key questions which will guide the response by the public as part of the review of the discussion paper. Your response may be submitted not later than **May 20, 2022**, to the following email address fin@centralbank.go.ke, or through the online form via this link: https://forms.office.com/r/2UB3cVRzK2

Call for Comments Questions

1. Which institution/group do you believe is responsible for tackling financial exclusion in any given domestic market? [Multiple answer question]
   a. Central Bank
   b. National Government
   c. Commercial Banks
   d. Non-Profits/Third Sector
   e. The individual

2. How important do you believe the topic of financial inclusion to be in relation to the development of domestic retail CBDC? [Only one answer]
   a. Vital (It won't develop without it)
   b. Important
   c. Somewhat important
   d. Not important
   e. Completely unrelated (no bearing whatsoever)

3. How would a CBDC impact financial inclusion, either as part of a wider strategy or in isolation?

4. How would CBDC affect cross-border transactions, either as part of a wider strategy or in isolation?

5. How would a CBDC affect the financial sector? What tools could be considered to mitigate any adverse impact of CBDC on the financial sector?

6. What factors would determine the level of adoption of CBDC as a means of payment in Kenya?

7. What advantages and disadvantages do you believe CBDC would introduce over the existing digital payments landscape in Kenya?

8. What additional potential opportunities, considerations, or risks of a CBDC may exist that have not been discussed in this paper?

9. Are there additional ways to manage potential risks associated with CBDC that were not discussed in this paper?

10. Which model of CBDC do you believe would be the most suitable in Kenya and why?

11. Are there additional design principles that should be considered that were not discussed in this paper?

12. How could a CBDC be designed to achieve maximum interoperability with the existing payment platforms in Kenya?

In the event of any query or clarification, please contact:

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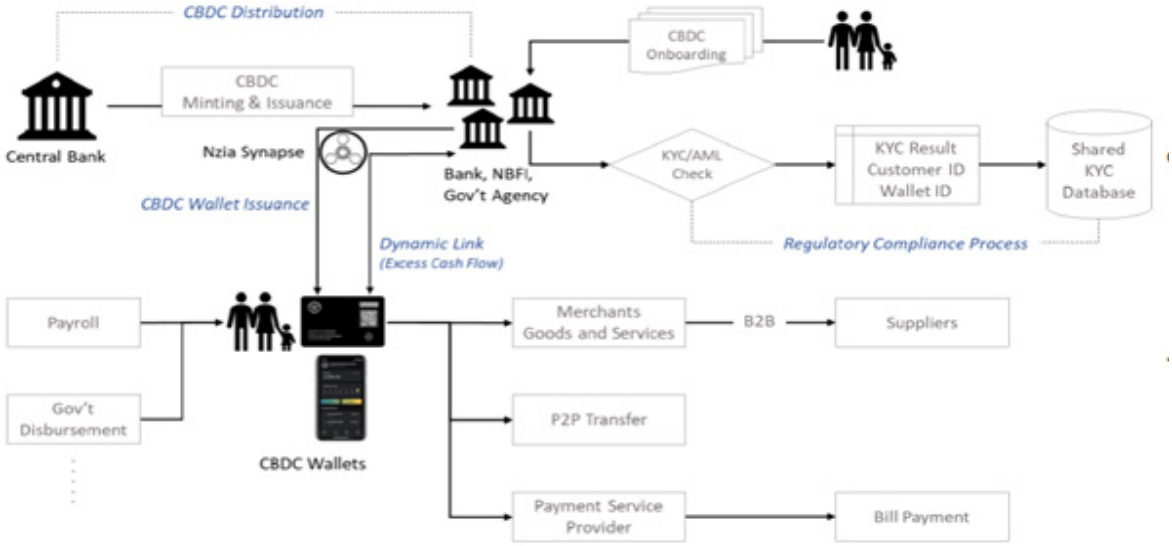
ANNEX I: REVIEW OF OTHER JURISDICTIONS' APPROACHES

Bahamas Sand Dollar

As of 2017, around 90 percent of the Bahamian population had smartphones with mobile wallet capabilities. Financial literacy surveys conducted by the Central Bank of Bahamas (CBOB) showed that a high share of the population would be likely to use digital financial services.[43] This triggered the launch of the pilot phase of the Sand Dollar project in December 2019.

The Sand Dollar is issued by CBOB through authorized financial institutions and carries the same value and consumer protection as a traditional Bahamian dollar. It allows greater flexibility and access for residents that want to participate in financial services via either a mobile phone application or using a physical payment card to access a digital wallet. It also provides a record of income and spending, which can be used as supporting data for micro-loan applications. The purchase of the Sand Dollar is made in the equivalent fiat currency.

Figure 5: Digital Sand Dollar Eco-System



Source: CBOB[44]

Singapore's Project Ubin

Singapore launched an exploratory project in CBDC called Project Ubin using Blockchain and Distributed Ledger Technology (DLT). July 13, 2020, marked the completion of Project Ubin's fifth and final phase. In this last phase, the Monetary Authority of Singapore, (MAS) completed a range of tests on blockchain-based payments solutions supporting several currencies. The project explored the development of the multi-currency payments model, to provide connectivity interfaces for other blockchain networks to connect and integrate seamlessly. The multi-currency payments network prototype developed under this phase successfully settled payments in different currencies on the same network.

[43] https://www.centralbankbahamas.com/viewPDF/documents/2019-12-25-02-18-11-Project-Sanddollar.pdf

[44] NBFI –Non- bank financial intermediary.
Nzia Synapse is a platform, provided by a Bahamas based blockchain company NZIA, that enables companies to build and launch financial products leveraging on application programming interfaces (APIs).

The payments network prototype, developed in collaboration with J.P. Morgan and Temasek, continues to serve as a test network to facilitate collaboration with other central banks and the financial industry for developing next-generation cross-border payments infrastructure. On July 8, 2021, MAS and Banque de France (BdF) announced the successful completion of a wholesale cross-border payment and settlement experiment using CBDC.

Eastern Caribbean's DCash

In 2019, the ECCB launched a pilot project to mint a digital version of the Eastern Caribbean Dollar (DCash) as legal tender. Not designed to replace cash, DCash is planned to circulate alongside physical notes and coins. The ECCB will issue DCash to banks and approved non-bank financial institutions on a private permissioned blockchain network. The overall goal is to help build resilience into the financial system and promote financial inclusion for citizens in the Eastern Caribbean Currency Union.

Bank of England

BOE is proposing the following approach to designing CBDC:

- ☐ Understand the opportunities and challenges of CBDC
- ☐ Set an overall objective that any design of CBDC would need to meet
- ☐ Design CBDC - There would be two main elements in the design:
  - i) The CBDC itself.
  - ii) The CBDC infrastructure allows CBDC to be transferred and used for payments.

BOE, though its CBDC discussion paper has invited feedback and ideas from the public to facilitate the assessment of CBDC for future deployment.

Sweden's e-Krona

In April 2019, the Riksbank began researching on the introduction of a CBDC, e-krona, to which the general public would have access, driven by the decreasing use of cash. The Riksbank tested e-wallets, distributed ledger technology, and levels of interoperability across participant banks. The goal of e-krona would be to increase the safety and efficiency of electronic transactions.

Following the initial pilot in December 2020, the Riksbank launched a review into the feasibility of having Sweden move to a digital currency. The review is expected to be completed by the end of November 2022.

Canada's Project Jasper

In 2017, Payments Canada initiated Project Jasper to explore the wholesale use of a CBDC. The scope of work included improvements to the platform to explore the efficiency of blockchain technology when applied to high-value interbank payments clearing and settlement processes.

BOC also participated in MAS' Project Ubin on CBDC cross-border payments, thorough Project Jasper-Ubin in 2019. The collaboration assessed how distributed ledger technology (DLT) could lead to more cost-effective, safer and more efficient cross border and cross-currency payments with the adoption of different types of DLT platforms. While the project demonstrated that a DLT approach was capable of settling payments and securities obligations, BOC remains in an exploratory phase regarding the wholesale use of CBDC.

Central Bank of Kenya

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