TECHNICAL ASSISTANCE REPORT

NAMIBIA

Retail Central Bank Digital Currency Exploration and Roadmap

February 2024

Prepared By

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Contents

Figures

Tables

Annex

Glossary

ACH	Automated Clearing House
AML	Anti-Money Laundering
API	Application Programming Interface
ATM	Automated Teller Machine
BoN	Bank of Namibia
CBDC	Central Bank Digital Currency
CMA	Common Monetary Area
EFT	Electronic Funds Transfer
E-Money	Electronic Money
FMI	Financial Market Infrastructure
FX	Foreign Exchange
ICT	Information and Communication Technology
IMF	International Monetary Fund
IPS	Instant Payment Solution
KYC	Know-Your-Customer
MCM	Monetary and Capital Markets Department (IMF)
NAMFISA	Namibia Financial Institutions Supervisory Authority
NISS	Namibia Interbank Settlement System
NPS	National Payment System
PAN	Payments Association of Namibia
PFMI	Principles for Financial Market Infrastructures
POS	Point of Sale
PSOC	Payment System Oversight Committee
PSP	Payment Service Provider
rCBDC	Retail Central Bank Digital Currency
RTGS	Real-Time Gross Settlement
SADC	Southern African Development Community
SARB	South African Reserve Bank
SME	Small-Medium Enterprise
SOC	Security Operations Center
TA	Technical Assistance
TCIB	Transaction Cleared on an Immediate Basis

Preface

At the request of the Bank of Namibia (BoN), the International Monetary Fund (IMF) conducted a technical assistance (TA) from January 15 to February 1, 2024.[1] The mission assisted the authorities in evaluating value propositions and reviewing foundational requirements of retail central bank digital currency (rCBDC). In addition, the mission helped draft a rCBDC exploration roadmap tailored to the Namibian circumstances and needs.

This mission was the third engagement with the BoN on rCBDC. The first engagement was BoN's participation in a virtual CBDC workshop held by the Central Bank of Lesotho in February 2023. The second engagement was a 4-day virtual CBDC training workshop in October 2023. The workshop strengthened the BoN's staff capability on rCBDC.

This third engagement was a hybrid mission involving several departments. Team members from the Monetary and Capital Markets Department (MCM), Information and Technology Department (ITD), and an AFRITAC South (AFS) Financial Market Infrastructure Advisor, engaged with the BoN on-site while the Legal Department (LEG), the Corporate Services and Facilities Department (CSF), and a Short-Term Expert attended virtually.

The mission met with Deputy Governor Leonie Dunn, representatives from multiple BoN departments (departments of Payments and Exchange Control, Monetary Policy, Financial Markets, Financial Stability, Banking Supervision and Strategy Projects and Change Management), as well as Namibian commercial banks, nonbank payment service providers (PSPs), a mobile network operator, and other government agencies and self-regulatory bodies.

The mission wishes to thank the authorities for their cooperation, productive discussions, and their hospitality.

[1] Virtual meetings started on January 15 and an onsite mission was conducted from January 23 to February 1, 2024.

Executive Summary

The BoN has been exploring the potential of rCBDC to modernize Namibian payment and financial systems. In October 2022, the BoN initiated a CBDC working group and published a CBDC consultation paper to seek public feedback to BoN's initial thinking and objectives for rCBDC. Key drivers for the BoN to explore a rCBDC include promoting financial inclusion, modernizing financial system modernization, as well as improving cross-border payments. Relatedly, Common Monetary Area (CMA) CBDC Cluster, a dedicated group established by the BoN and other CMA central banks, jointly evaluated CBDC for enhancing cross-border payments within the region.

In response to the BoN's request for assistance, the mission assisted in establishing the groundwork for a feasibility study of rCBDC and drafting a rCBDC exploration roadmap. The mission focused on analyzing Namibia's payment systems and financial inclusion and explored the potential value propositions and drawbacks of rCBDC for addressing the current gaps. Additionally, the mission analyzed the implications of rCBDC for monetary policy and financial stability and evaluated the BoN's foundational requirements. Finally, the mission helped draft a rCBDC exploration roadmap, intending to foster a cohesive and coordinated approach for the BoN and external stakeholders. The mission's findings will serve as input to develop a position paper, which intends to outline the BoN's policy stance, strategies, and direction of rCBDC issuance.

Namibia's payment and settlement infrastructure has undergone significant improvement, but key shortcomings remain to be addressed. Several key initiatives to enhance payments in Namibia are underway such as NamPay to modernize funds transfers and Instant Payment Solution (IPS) to enable real-time retail payments. However, key challenges remain, including multiple and high fees of existing digital payments, limited interoperability and accessibility between different PSPs, and inefficiencies in cross-border payments.

Namibia has made notable progress in financial inclusion, yet challenges persist in enhancing access to financial services for the underbanked and unbanked population. As of 2017, around 78 percent of Namibian adults were considered financially included, marking a steady increase from 69 percent in 2011. Also, both bank account ownership and digital payment usage in Namibia have shown positive trends, surpassing the Sub-Saharan Africa's regional average. However, limited accessibility to digital infrastructure in rural areas, high digital transaction costs, strong preference for cash, and low financial literacy continued to be main barriers to the enhancement of financial inclusion in Namibia.

The mission did not find a strong case for issuing a rCBDC at the moment, considering forthcoming payment instruments and improvements. For example, IPS initiative has already set out the approach to addressing affordability and interoperability issues for domestic digital payments. Transaction Cleared on an Immediate Basis (TCIB) can enhance its usages for cross-border retail payments. Major commercial banks, which have committed to these payment initiatives, may not have additional resources available to support a rCBDC project. Meanwhile, rCBDC's potential benefits from offline and programmability rest on untested technologies intended for a large-scale adoption, which may pose systemic risks if poorly designed.

Similarly, the mission found that root causes for financial inclusion would not be directly solved by rCBDC, whereas alternative solutions may present more accessible and immediate benefits. Despite of its potential in promoting market competition, enhancing innovation, and offering offline payments, rCBDC is unlikely to address underlying causes for financial exclusion, including inadequate infrastructure and low financial literacy. Some non-CBDC solutions, especially greater push by the authorities to support PSPs catering to underserved segments as well as to improve financial literacy education, could be more effective in addressing the issues and should be prioritized.

rCBDC issuance could have significant implications for both monetary policy and financial stability, but these effects can be attenuated through careful designs of rCBDC and enhancements to monetary operations. For monetary policy, rCBDC could challenge the BoN's liquidity management, increase short-term market rate volatility, and complicate FX reserve management, potentially diminishing the alignment between the BoN and the SARB's repo rates if rCBDC were used across border. For financial stability, a significant substitution from bank deposits to rCBDC could lead to banking disintermediation risk.

Based on the above assessments, the mission recommended that the BoN should:

- **Establish a compelling rationale for rCBDC before embarking on a more resource-intensive exploration**. The BoN should further assess benefits and risks of both rCBDC and non-CBDC solutions. It should establish internal policy dialogues and facilitate a well-informed decision-making. In addition, the BoN should continue engaging with stakeholders to stay informed of the developments in digital money and payments.
- **Evaluate the roles of existing payment service solutions and rCBDC in addressing the challenges in financial inclusion.** The BoN should assess the extent to which the existing payment services have addressed key financial inclusion challenges and identify any remaining gaps that could be addressed by rCBDC. Moreover, the BoN could explore rCBDC unique designs to further support financial inclusion including offline payments, interoperability and zero cost of transactions.
- **Assess macro-financial implications and explore solutions to mitigate macro-financial risks.** The BoN should conduct macro-financial analysis on rCBDC and explore how rCBDC design (for example, imposing holding limits) and other measures (for example, strengthen capacity to forecast and manage liquidity) can mitigate potential macro-financial risks. Also, a close collaboration among the CMA central banks is critical to limit currency substitution risk and preserve financial stability.
- **Address gaps in institutional capacity, digital readiness, and legal foundations, should the BoN choose to issue a retail CBDC in the future.** The rapid developments of technologies and business use cases may prompt the BoN to consider issuing rCBDC in the future. Thus, the BoN should continue developing internal expertise in policy and technology while ensuring a balanced resource allocation between rCBDC and other alternatives. The BoN should further support the development of digital infrastructure and regulations such as collaborating with other government agencies and development partners to improve digital and power infrastructure. Finally, the BoN should modify the definition of currency in the BoN Act and review its internal policies and governance structure. If rCBDC were to be used across border, the BoN should undertake a comprehensive review of the CMA agreements and aligns relevant legislations for convergence.

Lastly, the mission helped draft the roadmap for the BoN's rCBDC exploration. By adopting a design thinking approach, the mission and the BoN identified learning goals and milestones which were categorized into four themes: (1) evaluate alternative payment methods; (2) assess macro-financial implications of rCBDC; (3) continue learning rCBDC design features that can bring extra value; and (4) develop and support initiatives that enable payment digitalization. Priorities, timeline, and required resources were then assigned to each key action items in the draft roadmap.

Recommendations

Table 1. Key Recommendations

Recommendations for the Bank of Namibia	Priority	Timeframe 1/
rCBDC for Payments		
rCBDC exploration		
Establish a compelling rationale for rCBDC to address challenges in payments with clear objectives, assumptions and planning before embarking on a more resource-intensive exploration such as prototype or pilot (paragraph 31).	High	MT
Continue monitoring and learning developments in digital money and payments, not limited to CBDCs and engage with relevant stakeholders to gain better insights (paragraph 32-33).	Medium	MT
Non-CBDC alternative solutions		
Reduce regulatory burdens and enable regulatory environments to further support competition and innovation in payments such as supporting nonbank PSPs as direct participants for key payment systems (paragraph 33-34).	High	MT
Promote payment interoperability by adopting open and globally endorsed standards to eliminate inefficiencies and avoid fragmented payment systems (paragraph 35).	High	LT
Ensure that IPS can provide immediate settlement in central bank money for domestic payments and increase participation in TCIB for cross-border retail payments (paragraph 36-37).	High	LT
rCBDC for Financial Inclusion		
rCBDC exploration		
Evaluate how existing payment solutions can address barriers to financial inclusion and what additional values of rCBDC can uniquely bring to bridge the remaining gaps, such as exploring offline capability of rCBDC (paragraph 52-53).	Medium	MT
Continue engaging with public and private stakeholders to explore adoption incentives and further promote financial literacy education (paragraph 54).	Medium	MT

Recommendations for the Bank of Namibia	Priority	Timeframe 1/
Non-CBDC alternative solutions		
Provide further support to payment service providers catering to underserved segments by offering incentives and alleviating regulatory burdens and strengthen efforts to enhance consumer protection and financial literacy (paragraph 55-57).	Medium	LT
rCBDC's Implications for Monetary Policy and Financial Stability		
Assess the macro-financial implications of rCBDC; together with rCBDC design options to limit risks (paragraph 78).	High	MT
Further strengthen capacity to forecast and manage liquidity and collaborate with other CMA central banks to mitigate the risks of currency substitution and to revise the CMA's requirements for FX reserve coverage (paragraph 79-81).	Medium	MT
Foundational Requirements		
Institutional capacity. Continue develop internal expertise regarding CBDCs. Ensure that the financial and human resources allocated for the CBDC project do not hinder existing, more urgent reform initiatives (paragraph 109-111).	High	MT
Technology readiness. Influence discussions and collaboration with respective Namibian agencies to explore the public private partnership (PPP) and engage with development partners to address the gaps in digital and power infrastructure. Support the development of the National Digital ID system. Review specific regulation about data localization requirements (paragraph 112-116).	High	MT
Cybersecurity readiness. Take further measures and review relevant regulations to ensure effective cyber risk management. Establish and promote the cyber information sharing platform for the financial sector (paragraph 117-118).	High	ST
Legal foundations. Modify the definition of currency in the BoN Act if rCBDC is issued. Undertake a comprehensive review of the CMA arrangements if rCBDC is used cross-border (paragraph 119-123).	Medium	MT
Roadmap		
Continue refine the draft of the roadmap and engage with other internal departments and external stakeholders to ensure consistencies in policies, resource allocation and timelines (paragraph 136).	High	ST

1/ ST: short term: < 12 months; MT: medium term: 12 to 24 months; LT: long term: > 24 months.

I. Introduction

1. **Central bank digital currency (CBDC) has been a subject of interest for central banks in Sub-Saharan Africa**. According to a 2023 IMF survey of Sub-Saharan countries, more than 75 percent of surveyed countries are currently exploring CBDC, with improving financial inclusion and domestic payment efficiency as top motivations. The survey also shows that central banks are at different paces for exploration.[2] Two-thirds are in the research phase (for example, Eswatini, Lesotho) whereas others are at an advanced stage or already plan to complete CBDC pilots within the next few years. Nigeria became the second country (after Bahamas) to launch its retail CBDC (rCBDC), eNaira, in October 2021. Meanwhile, South Africa has been exploring wholesale CBDC under Project Khokha. The country also partners with Australia, Singapore, and Malaysia to develop prototypes of a shared platform, to enable international settlements using CBDCs issued by multiple central banks under Project Dunbar.[3] Ghana also engaged with a private technology vendor to pilot a rCBDC, eCedi. However, Kenya stated that CBDC is not a compelling short- or medium-term priority, after issuing a discussion paper on CBDC. Overall, technical, capacity, and legal challenges impose key concerns for regional central banks to pursue and operate a CBDC.

2. **The BoN has been exploring rCBDC, including collaborating with CMA countries**. Exploring CBDCs is part of the policies and strategic efforts to modernize the financial system of Namibia. Aligned with the directions of other member countries in the Common Monetary Area (CMA), Namibia has formed an inter-departmental working group since 2022 to explore and research CBDC. In October 2022, the BoN published a consultation paper on CBDC seeking public opinions for the BoN's policy direction in this area. Between the CMA countries, a CMA CBDC Cluster and Project Sunbird were formed under a direction of the CMA governors to collaboratively investigate the potential use cases of CBDC for cross-border payments in the CMA region. In the context of Namibia, the explorations of CBDCs for domestic and regional use case were pursued in parallel. Given the close economic ties within the CMA, any policy decisions, and directions on CBDC taken by the BoN will be shared and consulted with the CMA CBDC Cluster.

3. **This report is organized as follows.** Section II analyzes the value proposition of rCBDC to improve payment systems. Section III analyzes the value proposition of rCBDC to improve financial inclusion. Section IV evaluates macro-financial implications. Section V discusses the foundational requirements. Section VI outlines a draft roadmap. Section VII concludes.

[2] See Ricci and others (2024).

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

II. Evaluating rCBDC's Value Propositions to Improve Payment Systems

A. Assessment

4. **The section assesses rCBDC's value propositions for improving payments in Namibia.** It examines the current payment infrastructure and services and the remaining challenges within Namibia's payment landscape. The subsequent analysis explores how rCBDC and alternative solutions could potentially provide value by addressing these challenges and enhancing the overall efficiency of payment mechanisms. This assessment does not intend to evaluate Namibia's payments in the PFMI context, but rather to analyze the potential value propositions of rCBDC in Namibia's context. The section then concludes with recommendations.

Overview of the Payments and Settlement Infrastructure

5. **The current payment and settlement infrastructure in Namibia is well developed with designated systemically important financial market infrastructures (FMIs)**. The National Payment System (NPS) in Namibia comprises a real-time gross settlement system (RTGS) — Namibia Interbank Settlement System (NISS) and an automated clearing house (ACH) — the Namibian Clearing House or NamClear. The NPS of Namibia compares favorably to those in other developing countries, with a wide range of payment stream options, such as electronic funds transfer services, card services and electronic money for domestic and international payments. The RTGS and the ACH were designated as systemically important FMIs in 2018 and were required to adhere to the Principles for Financial Market Infrastructures (PFMI). Additionally, the inter-regional cross-border transactions are facilitated through a regional system called SADC-RTGS. In terms of other FMIs, Namibia has yet to establish a Securities Settlement System (SSS) or a Central Clearing Counterparty (CCP). However, there is a project is currently underway to implement a Central Securities Depository (CSD).

Namibian Interbank Settlement System (NISS)

6. **NISS is an RTGS that facilitates fast and efficient interbank transfers between participants and provides final settlement of payment obligations.** NISS facilitates the settlement of domestic high-value interbank payment transactions, which are cleared through NamClear. Settlement in NISS is considered final and irrevocable. NISS is designed with risk management tools to manage credit, liquidity, and settlement risks by enabling collateralized lending to participants through overnight and intra-day lending facilities. The aggregate settlement value recorded in NISS in 2023 was N$1,205.2 billion (around 5 times of GDP) with a total volume of 93,056 transactions, averaging 319 transactions per settlement day.[4] Over the past five years, the average annual growth of the aggregate value and volume settled in NISS have been at 5.7 percent and 9.5 percent respectively.

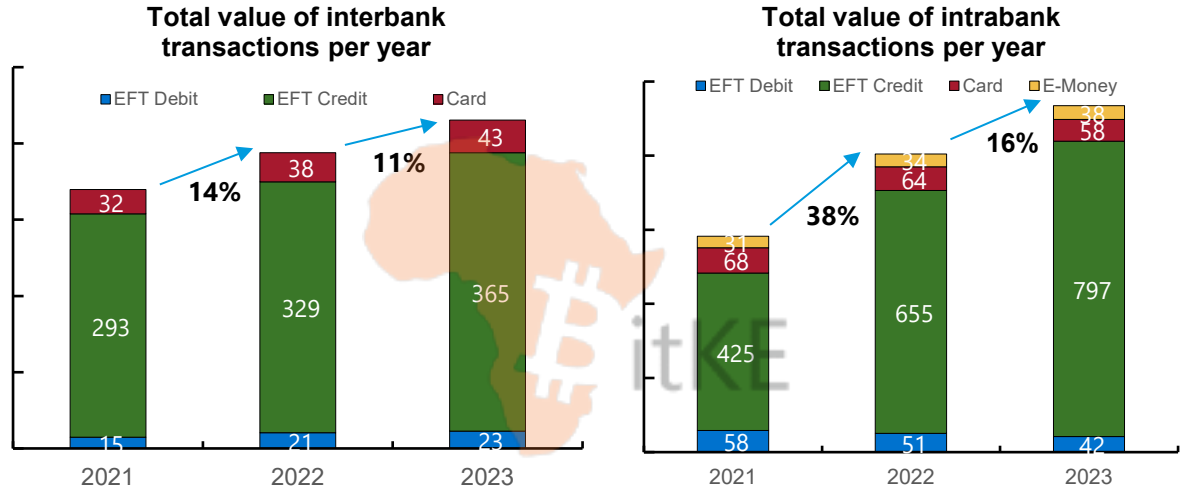
7. **NISS is owned and operated by the BoN, while its governance structure is well-integrated with the BoN's overarching governance arrangements.** The BoN's National Payment System Department operates and oversees NISS, and has two divisions within, namely the Settlement System Operations Division and Policy and Oversight Division.

[4] Bank of Namibia - Annual Reports 2023 (bon.com.na).

Namibian Automated Clearing House (NamClear)

8. **NamClear is an ACH which provides clearing for domestic interbank transactions.** NamClear processes all interbank electronic funds transfers (EFT) and card payments settling in NISS and is the only infrastructure that provides interbank clearing services.[5] The total value of interbank transactions cleared through NamClear in 2023, which is the sum of EFT debit and credit and card payment transactions, was N$431 billion, representing 35.7 percent of the aggregate value settled in NISS. Both EFT (debt and credit) and card transactions continued to increase, with a total value of N$388 billion and N$43 billion in 2023, respectively. Similarly, the value of EFT intrabank transactions and card transactions between merchants and customers also increased to N$839 billion and N$58 billion, respectively. In addition, intrabank electronic money (e-money) schemes also exhibited a similar trend, with its transactional value increasing to N$38 billion in 2023.

Figure 1. Interbank and Intrabank Transaction Value in Namibia (in N$ billion)



Sources: Bank of Namibia's National Payment System Statistical Data.

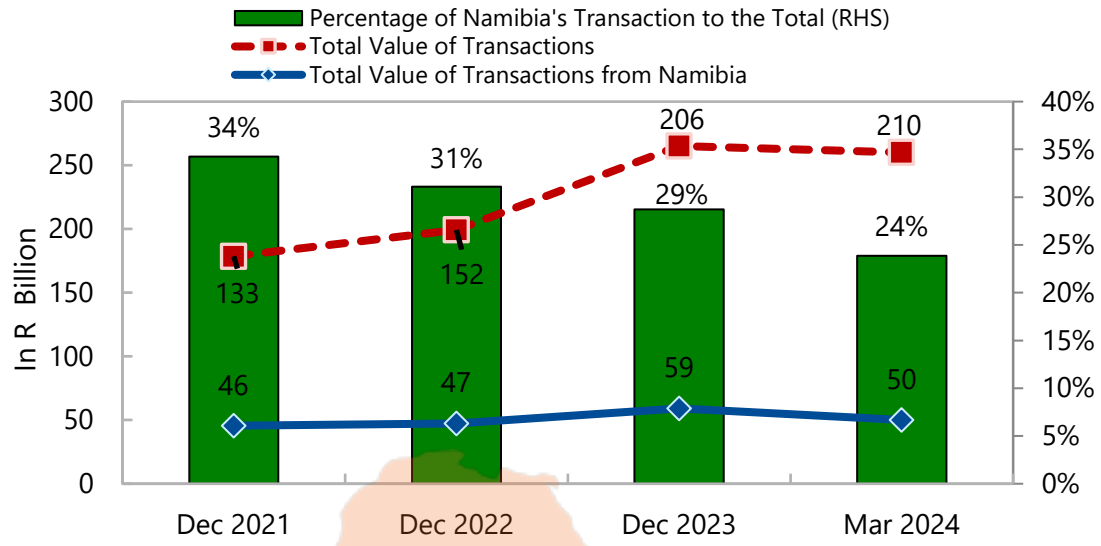
SADC-RTGS for Cross-Border Payments

9. **Namibia is a member of the Southern African Development Community (SADC) RTGS, a regional settlement system which processes time-critical or high-value payments between SADC countries.** SADC RTGS is operated by the South African Reserve Bank, but the ownership remains within the SADC central bank member countries. The transactions are processed in single or batched settlement instructions in real-time or on a delayed basis. The system currently operates on a prefunded basis in South African rand. There are ongoing discussions to include other currencies such as the US dollar as a settlement currency due to the high use of the US dollar for SADC intra-trade. 15 of the SADC 16 member countries participated in the SADC RTGS. The participants traditionally only included central and commercial banks. However, the SADC Payment System Oversight Committee (PSOC) recently broadened the

[5] One of the products and services offered by NamClear is NamSwitch, which provides online, real-time card transaction and clearing as well as batch clearing, for settlement in NISS.

access and participation criteria to nonbank payment service providers (PSPs). Five out of the 90 SADC RTGS participants are from Namibia. Nonbank PSPs are also among the five participants. In March 2024, the total value of payments processed in the SADC RTGS reached R210 billion, in which the Namibian banks accounted for 24 percent.

Figure 2. SADC-RTGS Transaction Value (in R billion)



Sources: SADC-RTGS Statistics and Indicators

Regulation and Oversight of Payment and Settlement Infrastructure

10. **The Payment System Management Act of 2023 outlines the establishment, management, administration, operation, regulation, oversight, and supervision of payment, clearing, and settlement systems in Namibia.** The Act stipulates the powers and functions of the BoN to ensure the safe, secure, efficient, and effective operation of the NPS, and the promotion of accessibility of the NPS by the public. The Act also provides the requirements on the licensing and authorization of payment instruments, PSPs and payment system operators, as well as the development of the regulatory framework for the issuance of electronic money. The BoN applies a risk-based approach to oversight through on-site and off-site activities, including the use of assessment and collection of information from the regulated institutions in the NPS.

11. **The BoN's National Payment System Department derives its regulatory power from the Bank of Namibia Act 1 of 2020 and its payment operations and oversight power from the Payment System Management Act of 2023.** The Payments Association of Namibia (PAN) also serves as an integral governance structure within the NPS. Due to the recent changes in the Payment System Management Act, the delegated regulatory authority of PAN to license and oversee PSPs was rescinded and reformulated to act as a collaborative platform for its members. The mandate further includes developing and administering technical standards and rules for member participation within the various payment systems.

12. **The BoN participates in the SADC PSOC for the SADC-RTGS.** The SADC PSOC was established to provide a cooperative oversight arrangement to manage and mitigate cross-border settlement and systemic risks within SADC payment system environment. The cooperative oversight arrangement is outlined in the SADC PSOC Memorandum of Understanding, which was signed by onboarded member countries.

Overview of the Retail Payments Landscape

13. **Both banks and nonbanks provide a wide range of retail payment services.** The retail payment system consists of distinct payment systems and payment streams to facilitate the transfer of funds from payers to beneficiaries for both domestic and international payments. The participants in the NPS are seven banking institutions, 21 nonbank PSPs and the BoN.[6] The retail payment systems consist of Electronic Funds Transfer System (EFT consisting of internet banking, mobile banking, and debit order collections), card system (debit, credit, and hybrid cards) and e-money. The BoN has decommissioned the use of cheques as payment instruments since June 2019.

Retail Payment Services

14. **Commercial banks dominated the provision of payment instruments and services.** Banks are the only service providers of EFT and card systems, except for Namibia Post Limited (NamPost), which is a nonbank PSPs that also participates in the card system and accepts deposits. Only banks participate in clearing and settlement and provide sponsorship arrangements for some of nonbank PSPs. While not prohibited by regulations, nonbank PSPs appear to have little incentives to enter the clearing and settlement infrastructure. While card payments are widely accepted in Namibia, only four of the major banks in Namibia offer an acquiring network of Point of Sale (POS) devices to merchants.

15. **While increasingly being used, e-money is not widely adopted and lacks interoperability.** Eight e-money issuers exist in Namibia, including four banks and four nonbank PSPs. The e-money services offered by banks usually allow users to send funds to individuals without bank accounts, purchase value-added services, and withdraw at designated channels. The e-money services offered by nonbanks are niche, and their use is limited to specific purposes, such as for purchases of fuel or for students only. Although e-money services have expanded to multiple use cases such as utility bills and insurance, they are not fully interoperable with each other. As a result, the uptake of e-money remains restricted because of closed-loop systems, predominantly driven by e-money issuers' motivations to retain customers within their proprietary networks.

16. **The domestic payment transactions incur multiple fees and are generally high.** Many Namibians depend on Automated Teller Machines (ATMs) to access cash. However, the fee structures for withdrawals using ATMs are complex and vary across different banks, making it challenging for consumers to make comparisons.[7] The limited ATM network creates dependency on single ATMs in specific locations and the difficult use of other banks' ATMs further increase the cost. Fees are charged for all debit order payments to third party accounts, with only one bank providing the service free of charge. The near-real time credit transfer fees are significantly higher than ordinary credit transfers. Debit card purchases also entail fees, with only one bank offering it free of charge. Other banking charges include fees for purchasing airtime, electricity, and other prepaid services, while fees of e-money are specific depending on the types of transactions.

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[6] The nonbank PSPs in Namibia include 1) Namibia Post Limited, 2) Virtual Technology Services, 3) Nam-mic Payment Solutions, 4) VIVO Energy Namibia, 5) Windhoek General Administrators (Pty) Ltd, 6) Ecentric Namibia, 7) MobiCash Payment Solutions, 8) Virtual Card Services Namibia, 9) Adumo Online Namibia, 10) ATM Solutions Namibia, 11) EasyPay Namibia, 12) Hyphen Technology Namibia, 13) Innervation Group Namibia, 14) Selcom Payment Namibia, 15) Paymate Namibia, 16) RealPay Collections Namibia, 17) Collexia Payments Namibia, 18) Payat Payment Services Namibia, 19) StayToday Bookings Namibia (Pty) Ltd, 20) Nutun Transact (Pty) Ltd and 21) Buddy Industries (Pty) Ltd.

[7] Some of the banking institutions base their cash withdrawal fees on a percentage of the transactions value, others are set based on categories of transaction value, while others set minimum fees, plus a fixed incremental fee capped at a maximum fee.

Figure 3. Cash Withdrawal Fees Per Banking Institution for N$1,000

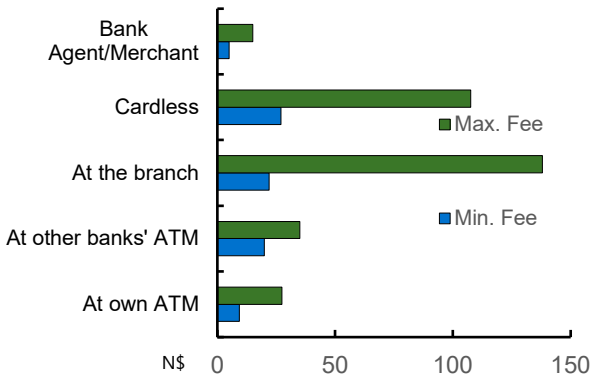
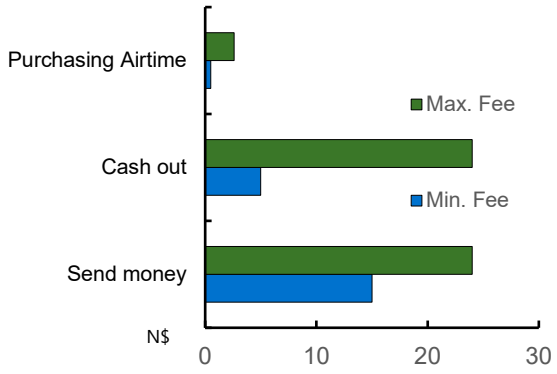


Figure 4. Digital Wallet Service Fees for N$1,000



Sources: Bank of Namibia Banking Fees and Charges Comparison Report (2023).

17. **The cost of cross-border retail payments remains high.** The increased regulatory considerations such as exchange control rules, anti-money laundering and combatting the financing of terrorism (AML/CFT) rules adds to the regulatory cost of payment transactions. The World Bank database revealed that the average transaction cost of sending cross-border remittances to Namibia was more than 19 percent in 2020, the third highest in the Sub-Saharan Africa region and the fourth highest in the world.[8]

18. **Cash remains the most prevalent and preferred choice of payments for most Namibians.**[9] Cash was regarded as the most preferred method of payment compared with digital payment methods such as cards, EFT, and e-money. It was perceived as safe, affordable, and generally a convenient means of making payments with no cost of transactions as opposed to digital payments. Cash was used for making daily payments while card and e-wallet methods are used for monthly payments through accessing nearby ATMs. Where ATMs were not available, consumers used in-store cash withdrawals. For the government's social grants, the Department of Social Affairs currently distributed grants to beneficiaries through different payment channels. Yet, cash remains the most favored option especially for pensioners, contributing to increased cash management expenses and a higher likelihood of payment errors.

New Developments and Projects Underway

19. **The development of Namibia's payment systems is guided by the Namibia National Payment System Vision and Strategy 2025.**[10] The document highlights four strategic themes, which includes Funding and Governance, Collaboration for ecosystem Resilience, Consumer-Centric Innovation and Human Resource Capacity Development. The adoption of innovative

[8] World Bank Remittance Cost data retrieved from: http://remittanceprices.worldbank.org/Average transaction cost of sending remittances to a specific country (%) - Namibia | Data (worldbank.org).

[9] Results from the BoN's Consumer Payment Choice and Behavior Survey in 2023, which surveyed a sample of 600 respondents across seven towns in Namibia in both urban and rural areas. For the survey on the most preferred methos for paying for goods and services, 84 percent of the respondents preferred cash, while card payments (debit and credit cards) are the second most preferred.

[10] Bank of Namibia - Namibia National Payment System Vision and Strategy 2021 – 2025 (bon.com.na)

solutions, real-time clearing, increased interoperability are key success indicators and the BoN has undertaken a range of activities to achieve these goals. The key initiatives include the introduction of NamPay, the development of IPS, and the enhanced adoption of TCIB for cross-border retail payments within the SADC region.

20. **NamPay intends to modernize the payment system by enhancing the EFT environment and implementing the new international financial messaging standards ISO 20022.** The project was jointly undertaken by the BoN, NamClear, and PAN. The payment system participants include commercial banks and nonbank PSPs. The objective of NamPay was to enhance the process efficiency of EFT transactions in Namibia across debit and credit payment streams. The initiative was introduced in response to the BoN's regulatory requirement on improving efficiencies.[11] NamPay replaced the existing payment streams and created the Enhanced Debit Orders (EnDO), Enhanced Credit Transfers (EnCR), and Near Real Time Credit Transfers (NRTC). EnDO assisted in lowering the incidence of fraudulent debit order processing, applied a randomization mechanism to ensure even ability to collect fund. EnCR created the ability to transfer payments in batches and in bulk. NRTC was a new payment stream created to speed up the processing times of payments and making interbank payments near instantaneous.

1. **The BoN is developing IPS to enhance financial inclusion and digitalization.** The IPS aims to modernize the payment system by developing an interoperable mechanism to enable the integration and collaboration across banks and nonbank PSPs. The system would enable real-time transaction processing and provide seamless integration with both domestic and regional payment ecosystems that would allow for 24/7 availability. The BoN has called for vendors to bid for the IPS development project and is finalizing the selection.

2. **Namibia has joined TCIB for cross-border retail payments within the SADC region**. TCIB is a cost-effective, interoperable clearing house solution designed for high volume, low value, and near real-time cross border payments. TCIB is designed to be an instant payment solution available on a 24/7/365 basis. TCIB provides the netting of the low value cross-border transactions, while the settlement of obligations occurs in the SADC-RTGS in batches. TCIB allows for participation from both banks and nonbank PSPs but are subjected to approvals by their respective domestic regulators. Namibia was among the first group of participants of TCIB. However, the overall adoption rate has remained low.

Value Proposition of rCBDC for Payment Systems

21. **rCBDC could become an instant and affordable retail payment and settlement system in central bank money which is accessible to different types of PSPs.** While IPS is yet to be introduced in Namibia, the system would be developed to function at a commercial bank money level. rCBDC system, on the other hand, would not need to rely solely on commercial bank accounts to operate. rCBDC users could make instant and affordable payments in central bank money across any digital payment products and services under one system. Nevertheless, in order to make rCBDC publicly affordable, risk-free and accessible, appropriate pricing and cost-sharing model of rCBDC must be carefully investigated as rCBDC operation would involve PSPs in a two-tier model. The model should provide sufficient business-viable incentives for these PSPs to operate rCBDC services, or the BoN could consider cost-subsidy to ensure rCBDC can serve as a public payment rail.

22. **rCBDC could enhance resiliency of payments**. The digital payment services in Namibia have been dominated by commercial banks. rCBDC could support the resiliency by serving as a backup payment system in case digital payments are disrupted. Nevertheless, cash is the most used and

[11] Payment System Determination (PSD-7): Efficiency Within the National Payment System.

publicly accessible means of retail payment, which can already serve as a back-up payment instrument in case of a disruption.

23. **rCBDC could enhance digital payments.** Due to the lack of interoperability among different payment systems, users are compelled to cash out for payments, incurring additional withdrawal fees. In geographically dispersed rural areas where most Namibians reside, the constraint of unavailable or limited connectivity persists as a hindrance to the widespread adoption of digital payments. This underscores the imperative to expand digital infrastructure and ensure the continued availability of cash in those regions. Therefore, rCBDC could unify and interoperate various digital payment methods from different providers within a singular payment system. The interoperability could enhance affordability for both PSPs and users since lower costs of digital payments would motivate users to transition away from cash usage. rCBDC thus can reduce associated costs and enhance interoperability between different digital payment instruments, which in turn, could motivate users to embrace and sustain their presence in the digital payment ecosystem and diminish the reliance and costs of cash.

3. Cross-border use of rCBDC could make remittances more affordable and convenient. rCBDC could allow instant money transfers from wallet to wallet residing in different countries. Yet, the exploration of cross-border use of rCBDC necessitates strong support and multinational regulatory agreements among collaborating nations to mutually accept rCBDCs issued by different central banks. Furthermore, the roles of TCIB and its coordinated development would need to be taken into account since the system is designed to serve a similar function for the SADC region.

24. **rCBDC could support financial innovation by functioning as an open and programmable platform**. This enables software developers or PSPs to create applications or services atop the rCBDC infrastructure. rCBDC could allow access to Application Programming Interfaces (APIs) and development tools, making it easy to integrate with other platforms and technologies, thus supporting the creation of a wide range of innovative financial applications and services. Nevertheless, the trade-off between data use and privacy protection, as well as cyber security must be carefully considered and proper regulations to ensure consumer protection and cyber resilience should be properly in place and enforceable.

25. **rCBDC could increase efficiency, transparency, and accuracy in government payments.** According to the United Nations' e-Government Development Index (EGDI), Namibia's e-government development remains lagging in terms of utilization and adoption of digital solutions.[12] Majority of social grant distributions rely on cash payments. rCBDC can be designed to be programmable and automatically execute conditional payments upon the fulfillment of specific criteria or requirements. This feature enhances transparency by guaranteeing that government transfers are allocated to designated citizens in accordance with predetermined conditions or eligibility criteria. To support this end, an offline functionality would be important since the targeted grant recipients could live in rural areas with unstable connectivity.

B. Recommendations

26. **Overall, the mission did not find a strong case to issue rCBDC in Namibia at the moment**. As discussed in the previous section, rCBDC could potentially bring several benefits to further enhance domestic payments and remittances. Nevertheless, the benefits would need to be weighted by the risks and costs of developing and operating rCBDC, as well as alternative solutions. Building a publicly accessible rCBDC would be a highly resource-intensive project and

[12] The EDGI is a benchmarking tool to provide a comparative assessment of the e-government development across countries. As of 2022, Namibia's EDGI stands at 0.5322, which is above the African region's average at 0.4054, but is below the world's average at 0.6102.

require long-term commitments from both the BoN and market participants. At the moment, many commercial banks have already allocated their resources for the IPS initiative and voiced concerns about the shortage of skilled labor. Thus, soliciting their participation in an additional payment project would exacerbate the existing challenges. Lastly, the key promising features of rCBDC, notably offline functionality and programmability, hinge on technologies that are still in the experimental phase. Therefore, if these aspects are not meticulously designed and cautiously implemented, they could pose significant risks to the overall system.

27. **Non-CBDC alternative solutions are available and may potentially demand less time and resources compared with rCBDC**. For domestic payments, the ongoing IPS initiative has already set out to address the challenges in affordability and interoperability of digital payments. Since majority of Namibians already have bank accounts, IPS can readily leverage on the current setting to provide interoperable account-to-account payments. For remittances, TCIB can be further supported to enhance its usages for cross-border retail payments. Beyond the development of new payment infrastructures, additional policies and regulatory measures can be explored to address the identified gaps within the payment landscape. Against this background, the mission provides recommendations on CBDC exploration by considering non-CBDC alternative solutions that could help address the challenges in Namibia's payment landscape.

rCBDC Exploration

28. **The BoN should establish a compelling rationale for rCBDC to address challenges in the payment systems before embarking on a more resource-intensive exploration.** As the mission did not find a strong support for rCBDC issuance to address gaps in payments, it recommends against pursuing advanced technological exploration beyond proof-of-concept until tangible benefits of CBDC for payments are evident and a comprehensive framework of objectives and use cases is firmly established. The BoN should clarify objectives, assumptions, and planning before embarking on a more resource-intensive exploration such as prototype or pilot. In addition, the BoN could further investigate both rCBDC and non-CBDC solutions to evaluate merits and drawbacks of different options would help establish internal policy dialogue and facilitate a well-informed decision-making going forward.

29. **The BoN should continue monitoring and learning the global developments in CBDCs and digital payments.** While the mission did not find an urgent case for rCBDC at the moment, the circumstance may change as markets mature, user preferences evolve, and CBDC research progresses. Without heavily invest in resource-intensive experiments, the BoN could still benefit from keeping abreast of global developments in CBDCs and digital payment and building internal capacity and knowledge in this area by dedicating staff to monitor or conduct research or participating in relevant training programs.

30. **The BoN should engage with relevant stakeholders to gain insights on their perspectives and evolving needs for digital money and payments in Namibia.** Continuous communications and exchanges of views with banks, nonbank PSPs, other policymakers, and the public would help the BoN gain a better understanding of a rapidly changing digital payment environment and different perspectives on the benefits and risks of rCBDC from various stakeholders.

Non-CBDC Alternative Solutions for Payments

31. **Non-CBDC solutions could help address challenges in the payment systems.** Some non-CBDC solutions can leverage the existing infrastructures, technologies, and regulations to enhance digital payments in Namibia. Furthermore, non-CBDC solutions and rCBDC exploration for payments are not mutually exclusive and can be pursued concurrently. In fact, a more robust payment infrastructure would facilitate the potential issuance of rCBDC should the BoN decide to do so in the future.

32. **The BoN should reduce regulatory burdens to access payments and settlement arrangements for nonbank PSPs as direct participants while assess associated risks.** With the advent of technological advances and business use cases, more nonbank PSPs have entered the financial services sector and offered innovative products and services for underserved customers. Although the participation of nonbank PSPs is not prohibited, the regulatory requirements to participate are perceived to be strenuous from their perspective. Direct participation by nonbank PSPs could enhance a level playing field and foster greater competition and innovation in payments. It can also reduce the number of intermediaries required in the payments chain, which could lower operating costs and subsequently lower prices for customers. While encouraging more accessibility, the BoN should carefully assess the risks, including liquidity, credit, and settlement risks, of the new participants to ensure safety and soundness of the systems.

33. **The BoN should enable regulatory environment and development of open platforms to support competition and innovation in payments**. Innovation in the Namibian financial and payment services market has been largely driven by commercial banks. The BoN can foster a regulatory environment and facilitate the creation of open platforms that encourage the entry of new service providers into the market. This, in turn, could empower them to provide more innovative services leveraging payment information and data. The incorporation of emerging solutions, such as open banking, has the capability to enable service providers to diversify their products and services, granting access to a wider array of financial services.

34. **The BoN should promote payment interoperability by adopting open and globally endorsed standards to eliminate inefficiencies and avoid fragmented payment systems**. In Namibia, the e-money services created by commercial banks are largely based on closed-loop, proprietary technology platforms with limited interoperability, resulting in inconvenience for consumers, higher costs for merchants, and less motivations to use digital financial services. The BoN could play an active role by adopting open and globally endorsed standards that enable interoperability between different payment channels. Increasing interoperability between existing and new PSPs could prevent fragmentation and lead to more competition, innovation, and efficiencies.

35. **The BoN should ensure that IPS can provide immediate settlement in central bank money.** The required features stipulated in the Expression of Interest for the supply and implementation of the IPS only refer to the real-time processing and switching capabilities but does not refer to immediate settlement. The settlement of the proposed transactions is anticipated to occur in NISS, using the central bank accounts of direct settlement participants. The design of the IPS should provide for final and irrevocable settlement of instant payment transactions. PSPs will therefore be able to use liquidity in a central bank account to settle payments instantly.

36. **The BoN should increase participation in TCIB for cross-border retail payments.** TCIB's adoption remains low, and some banks prefer to use SADC RTGS instead of TCIB for cross-border retail transactions. The BoN should further consult with banking participants to develop the most suitable system for reducing cost and increasing transaction speed for cross-border retail payments. Should TCIB be identified as the optimal solution, the BON may consider regulatory intervention to mandate the participation of Namibian payment system participants.

37. **The BoN should strengthen collaborations and engagement with a wider stakeholder group for the NPS developments**. The BoN has taken an approach to lead certain NPS developments as opposed to industry-led initiatives. This strategic approach is designed to enable the BoN to prioritize the attainment of policy objectives prior to emphasizing commercial incentives. Although the approach has many advantages, potential unintended consequences may include diminished levels of participation and adoption by industry participants and consumers. In order to mitigate these effects and ensure widespread involvement and early adoption, a proposed collaborative strategy involves continuous engagement in the development of solutions, encompassing both industry stakeholders and consumers.

III. Evaluating rCBDC's Value Propositions for Financial Inclusion

Assessment

38. **This section provides an assessment of rCBDC's value propositions for fostering financial inclusion.** Current progress and key challenges in financial inclusion are discussed in the overview, followed by the assessment for rCBDC and alternative solutions to address such challenges and further support financial inclusion. The section then concludes with key recommendations.

Overview of Financial Inclusion

39. **Namibia has seen positive changes in financial inclusion over the past years, particularly from high banking account ownership and growth in digital payments.** According to a 2017 Namibia Financial Inclusion Survey (NFIS) by Namibia Statistics Agency, around 78 percent of Namibian adults were financially included, marking a steady increase from 69 percent in 2011 and 49 percent in 2007.[13] The World Bank Global Findex data also shows recent trends in key financial inclusion measures such as account ownership and digital payments. The rate of bank account ownership in Namibia increased rapidly from around 60 to over 81 percent from 2014 to 2017, which then dropped slightly to 71 percent in 2021.[14] The slight decline from 2017 to 2021 may relate to effects from COVID-19 pandemic, the broader financial ecosystem change, and other supply-side and demand-side shocks.[15] It is above the Sub-Saharan Africa region average (55 percent) but below the world average (76 percent). For digital payments, Namibia has seen growth as 66 percent of adults in Namibia made or received at least one digital payment in 2021, increasing rapidly from 45 percent in 2014, and higher that of the regional average (49.5 percent) and the world average (64 percent).[16]

[13] According to 2017 NFIS survey, financial inclusion refers to adults who have or use formal and/or informal financial products or services. Financial products refer to instruments that help you save, invest, get insurance, or get a mortgage. These are issued by various banks, financial institutions, stock brokerages, insurance providers, credit card agencies and government sponsored entities.

[14] Account ownership in the World Bank Global Findex database refer to owners of accounts with banks or similarly regulated deposit-taking financial institutions such as a credit union, microfinance institution, or mobile money service providers.

[15] World Bank, Financial Inclusion in Sub-Saharan Africa, April 2024.

[16] Digital payments include the use of both in-store and online merchant payments with a mobile money account, a debit/credit card, or a mobile phone to make a payment from an account.

Figure 5. Account Ownership in Namibia

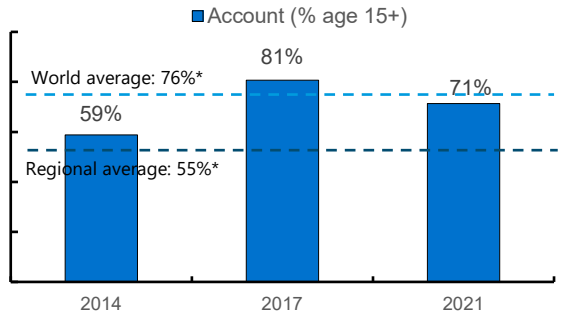


Figure 6. Share of Population Making or Receiving a Digital Payment in Namibia

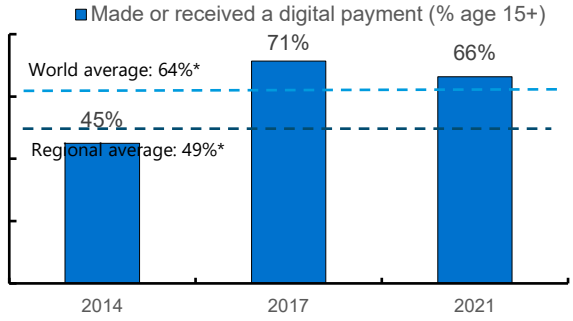


Figure 7. Namibia's Rural-Urban Gaps in Financial Access

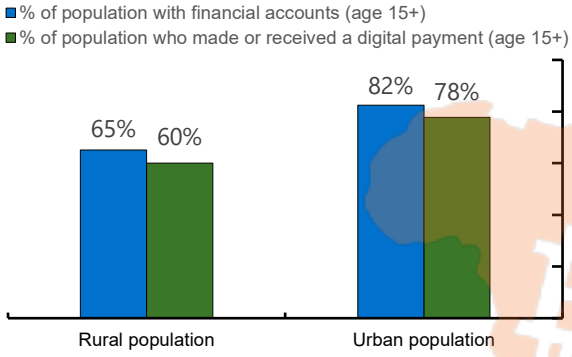
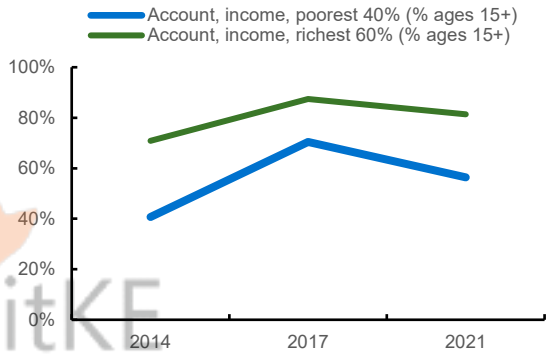


Figure 8. Namibia's Account Ownership by Income Groups



Sources: World Bank Global Findex database and IMF staff calculations

Notes: 1/ World and regional average metrics in Figures 5 and 6 are based in 2021.
2/ Figure 7 is based in 2021, which is the only year available for the urban-rural breakdown data.

40. **Nevertheless, remaining gaps, notably low access to accounts, credits, and digital payments, persist, particularly for the rural population and small and medium enterprises (SMEs).** Only 65 percent of rural area residents have an account, compared with 82 percent of account ownership in urban areas. The portion of adults in rural areas making digital payments is 20 percent lower than that that in urban areas.[17] Data also shows gaps in financial access between lower and higher income groups widened from 2017 to 2021, by both account ownership and digital payment measures. For SMEs, around 42 percent still face challenges to access credit.[18] The lack of a data protection law and a national digital ID scheme may also hinder the adoption of digital payments. In the absence of a data protection law, data breaches and misuses

[17] Data is from the World Bank Global Findex database.

[18] Source from IFC Micro, Small and Medium Enterprises (MSME) report, which defines micro enterprises as businesses with less than 10 employees.

made it easier for many Namibians fall victim to fraud. However, the Namibian government is drafting a data protection policy and considering introducing digital IDs.[19]

41. **Challenges remain for all stakeholders and deter financial inclusion in Namibia.[20]**

- *Residents:* Cash remains the dominant preferred payment method for Namibian people.[21] An overwhelming portion of people (84 percent of respondents) in Namibia prefer using cash for payments, compared to credit and debit cards (32 percent), e-money (6 percent), cellphone banking (4 percent), and mobile apps (1 percent). The high usage of cash may be contributed by the existence of a large informal sector (which accounts for almost 25 percent of Namibia's GDP and over half of the country's employment), high fees with using digital payments, an increase in card fraud, language barriers, and low financial literacy. [22]
- *Infrastructure:* Unstable or limited internet connectivity, relatively low smart phone penetration, electricity shortage, especially in the rural areas, undermined people's ability to access financial services and growth in the adoption of digital payment methods.[23]
- *PSPs:* Given the sparsely distributed Namibian population, major financial institutions lack incentives to expand their financial or payment services to the unbanked or underbanked population, as many found costs of cash management and transportation in remote and rural areas to be high while the market size is small. Also, banks' risk appetite for granting credits to small businesses has been low. Additionally, many PSPs chose close-loop designs for their digital payment solutions (for example, e-money) to keep their respective user bases, which, however, led to interoperability issues and sub-optimal user experience.
- *Merchants*: Merchants' low acceptance of digital payment platforms likely acts as another hurdle for financial inclusion. 76 percent of Namibian business owners preferred payments through cash while only 13 percent, 7 percent, and 4 percent of merchants prefer EFT, e-money, and cards, respectively. The interviews indicated that merchants' preference for cash payments, especially in the rural areas, may be associated with high fees with accepting digital payments and tax avoidance purposes.
- *SMEs*: many SMEs in Namibia still struggle to gain access to credits from formal financial institutions. Main obstacles include the lack of appropriate collateral, enterprises' limited credit track records and financial statements for credit evaluation, and low level of skills and training required to run successful businesses.

[19] Ministry of Information and Communication Technology has been drafting a Data Protection Bill 2022 (Vote-29-MICT-2.pdf (parliament.na)).

[20] Based on the mission team's interviews with market stakeholders (for example, banks, e-money providers, payment instrument providers) and the latest BoN's payment choice survey.

[21] 2023 Consumer Payment Choice and Behavior Survey by the BoN.

[22] The World Bank 's Informal Economy .

[23] More analysis about infrastructure is in Digital Readiness under the section Foundational Requirements.

Figure 9. Namibian Residents' Preferred Payment Method (in percent)

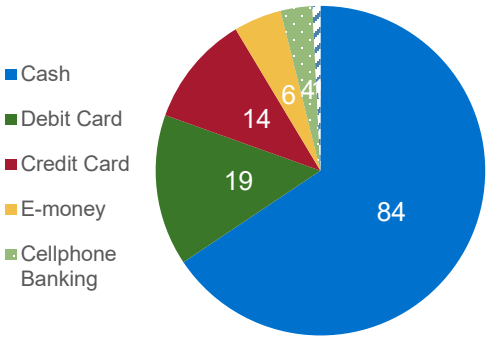
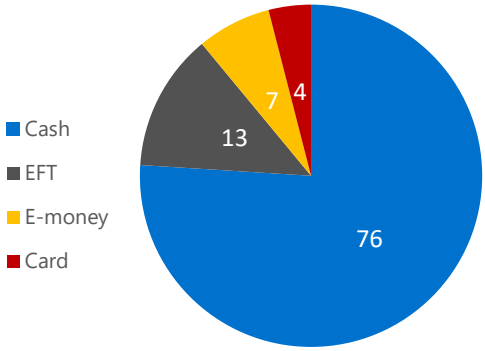


Figure 10. Namibian Merchants' Preferred Method to Receive Payment (in percent)



Sources: Bank of Namibia consumer payments choice and behavior survey report (2023).

Note: 1/ The total adds up to more than 100 percent because respondents were given the option to choose two options.

42. **Despite of the challenges mentioned, Namibia is also undergoing demographic changes that may provide more opportunities of digital transformation.** Namibia has a large young population with half of its 2.6 million population below the age of 24. The younger Namibians are more prone to digital technology and seek quicker and more convenient payment methods. For example, the younger generation of pensioners in Namibia are more open to digital payment means whereas the older generations would prefer cash.[24]

43. **The Namibian government has carried out a series of initiatives to promote financial inclusion.** The Namibian authorities launched the Namibia Financial Sector Strategy, a 10-year development strategy for Namibia's financial sector, covering 2011 to 2021. One of the five identified reform areas is financial inclusion, with a focus on improving consumer financial literacy and protection, as well as expanding access to financial services and products. During the pandemic, the authorities launched the Credit Guarantee Scheme in 2020 to address access to finance challenges facing many SMEs in Namibia. The Scheme aims to improve collaborate cover for bankable SMEs. The Scheme is part of the SME Financial Strategy developed by the BoN, the Development Bank of Namibia, and the Ministry of Finance. Yet, the uptake and impacts of these financing programs needs to be closely monitored.

Potential Value Propositions of rCBDC for Financial Inclusion

44. **As an open and programmable platform, rCBDC could promote market competition and facilitate the development of innovative financial services, thereby addressing gaps in financial inclusion.** By offering a level playing field and lowering the costs for various PSPs to access the infrastructure, rCBDC could encourage competition and innovation in the financial sector. Furthermore, rCBDC could be designed to facilitate interoperability of various services and

[24] According to the mission team's interviews with stakeholders.

technologies, thus enabling PSPs to expand their services to previously underserved or inaccessible markets.

45. **rCBDC could facilitate greater accessibility and affordability to digital financial services for the unbanked or underbanked population.** Unlike traditional payment systems, rCBDC can be designed to allow individuals to open rCBDC digital wallets and transact without owning bank accounts. This design facilitates simplified access to digital financial services, fostering increased participation in the formal financial ecosystem. Moreover, rCBDC could also lower costs by reducing intermediation in the existing retail payment transaction chain and eliminating minimum balance requirements.[25]

46. **An offline functionality of rCBDC could enable population in areas with poor network coverage to access financial services.** For example, for China's e-CNY pilot, the central bank has tested an offline payment that connects SIM cards with near-field communication capacities (NFC) and stored-value smart cards with hardware secure elements. The technology enables the completion of payments with e-CNY when both users and merchants do not have internet access. However, given the early stage of these experiments, the technology to fully support an offline payment functionality is yet to mature and requires more research on large-scale adoption, stability, and risk management.

47. **rCBDC could help underserved individuals or SMEs establish financial history, thus enabling better access to credit.** In the absence of a formal credit history, lenders and insurance companies could use rCBDC transaction data to evaluate an individual or business' financial behaviors, payment patterns, and financial creditworthiness and decide on whether to grant access to credit. However, privacy and data protection should be carefully considered. The rCBDC system should enable users to give consent for data sharing.

B. Recommendations

48. **The mission team found that the case for rCBDC to tackle financial inclusion in Namibia would depend on addressing common root causes for financial exclusion.** rCBDC may have potential to address some of the challenges but does not offer a unique value proposition to address financial exclusion issues at this juncture. Also, rCBDC alone would not be able to address underlying issues such as constraints within digital infrastructure and deficiencies in financial literacy. Conversely, some proposed non-CBDC solutions could serve as accessible and expedient alternatives, acting as low-hanging fruit in the broader strategy to enhance financial inclusion.

rCBDC Exploration

49. **The BoN should compare and evaluate the roles of existing payment service solutions and rCBDC in addressing the challenges in financial inclusion.** The analysis should focus on evaluating the impact of existing payment solutions (for example, IPS and open-loop e-money solutions) on overcoming key financial inclusion hurdles such as high fees, lack of interoperability, or connectivity issues. The analysis should also identify additional policy interventions, including rCBDC, to address the challenges.[26] To support this effort, the BoN may collaborate with the Namibia Statistics Agency to access the latest data and insights about financial inclusion, enabling data-driven and well-informed policy decisions.

[25] The settlement of transactions can be completed by directly transferring claims on the central bank's balance sheet between two parties who have CBDC.

[26] The latest Namibia Financial Inclusion Survey was conducted back in 2017.

50. **The BoN should explore unique design options of rCBDC which could potentially address barriers to financial inclusion in the Namibian context.** The BoN should ensure that the selection of technology of rCBDC should have sufficient maturity level to support the identified design options. Some of the design options include:

    - *Offline payment* to support rural and low connectivity areas and users without smartphones. The appropriate level of offline functionality and use cases should be clearly defined.[27]
    - *Programmability* to facilitate the development of innovative financial services for underserved markets.
    - *Affordability* to support zero transaction cost (cash-like) for both merchants and users. In parallel, the BoN should explore topics such as fee structure, incentive model, and financial sustainability of a rCBDC ecosystem.

51. **The BoN should continue engage with public and private stakeholders.** The BoN should collaborate with key stakeholders (for example, banks, merchants, and end-users) at the early stage to explore and identify incentives for them to participate in a rCBDC system. The BoN could consider organizing information sessions and online campaigns to share the BoN's CBDC exploration plan, results from public consultations, analysis of benefits and risks, and potential implications of rCBDC.

Non-CBDC Alternative Solutions for Financial Inclusion

52. **Non-CBDC solutions could be explored to address challenges in financial inclusion.** Instead of developing a novel payment infrastructure such as rCBDC, the BoN could consider alternative solutions such as supporting measures or regulations to enhance financial inclusion. The non-CBDC solutions and rCBDC exploration are not mutually exclusive and can be pursued in parallel.

53. **The BoN should provide greater support to PSPs catering to underserved segments by offering incentives and alleviating regulatory burdens.** For example, some nonbanks are launching open-loop e-money solutions that support Unstructured Supplementary Service Data (USSD)-powered transactions for users without internet connections. These services will also enable merchants to accept digital payments with lower costs. The BoN could consider providing incentives for these PSPs such as tax incentives/subsidies for expanding services to underserved populations or reducing regulatory burdens.

54. **The BoN should strengthen efforts to enhance consumer protection and financial literacy.** The availability of low-cost and efficient digital payment options does not necessarily guarantee a mass adoption. Education and awareness are essential to ensure that consumers have sufficient knowledge regarding rights, financial products, and services. To align with Namibia Financial Sector Strategy (Vision 2030), the BoN can step up its efforts and collaborate with PSPs on developing guidelines on consumer protection in banking services. Moreover, the BoN should continue supporting financial literacy education with strategic partners such Ministry of Finance (which is leading the inter-agency working group Financial Literacy Initiative), PSPs and entities with wide coverage in the rural areas (for example, NamPost, MTC), such as developing a national baseline that measures progress towards consumer education efforts and integrating financial literacy into the formal education curriculum in Namibia.

[27] An offline payment with CBDC is defined as a transfer of retail CBDC value between devices where those devices do not require a connection to any ledger system, often in the absence of internet or telecoms connectivity (BIS 2023).

IV. Evaluating rCBDC's Macro-financial Implications

55. **This section focuses on rCBDC's implications for Namibian monetary policy and financial stability.** It briefly describes the Namibian context, assesses risks and benefits and provides recommendations. The analysis rests on the assumption that the Namibian rCBDC would be attractive and accessible to retail users. A rCBDC with low adoption would imply insignificant macro-financial implications. rCBDC's macro-financial implications will depend on many factors, such as adoption level, eligibility rules, holding limits, remuneration, and fees.

A. Assessment

Monetary Policy

Overview [28]

56. **The BoN's key objective is to promote monetary stability and to contribute towards financial stability conducive to the sustainable economic development of Namibia**. The objective and functions of the BoN are specified in the BoN Act [29]

57. **The BoN operates a fixed currency peg with the Namibian dollar pegging at parity to the rand, as set out in the CMA arrangement.** To support the peg, the BoN maintains an external reserve coverage (mostly US dollar and rand) equivalent to the stock of Namibian dollar currency issued, providing for a collateralized liquidity facility with the South African Reserve Bank (SARB). In addition, the BoN sets target benchmarks to maintain the reserves equal to or above three times of monthly commercial bank net foreign transfers, three months of import value and 12 months of short-term foreign debts. The BoN conducts foreign exchange (FX) operations between Namibian dollar and rand daily to accommodate demand for currencies. Both Namibian dollar and rand are legal tender and circulate freely in Namibia. There is no exchange or capital controls within the CMA, but controls apply to non-CMA currencies.

58. **The BoN adopts various instruments to influence liquidity and interest rates in the Namibian dollar market.** The interest on seven days bank repos, or the repo rate, is the policy rate and is usually aligned with the SARB's repo rate. It affects other interest rates in the economy and serves as a reference for domestic borrowing costs, including mortgage rates. The interest rates on the settlement account and the overnight repo facility forms a corridor around the repo rate. Other instruments include BoN bills and Open Market Operations. The BoN's repo rate is currently at 7.75 percent, 0.5 percentage points below the SARB's repo rate.

Potential Implications of rCBDC

59. **The introduction of rCBDC could pose challenges to liquidity management and lead to increased volatility in short-term market rates.** A non-remunerated rCBDC would be an autonomous factor on the BoN's balance sheet as it would constitute a claim on the BoN governed by the demand from the general public. Similar to the situation when demand for banknotes and

[28] The sources for this section are from BoN's web page (in particular the "Namibia's monetary policy framework" document), the "Operational Notice on Money Market Operations" document, IMF Country Report No. 18/77, IMF Country Report No. 23/401 and information obtained in meetings with BoN staff.

[29] Bank of Namibia Act, Section 4 (1).

coins increases, an increase in demand for rCBDC would lead to a decline in the banking system's liquidity surplus (or an increase in the liquidity deficit), and vice versa. Due to its digital attribute and specific design features, the demand for rCBDC may be more volatile than the demand for cash. This may accentuate challenges in liquidity management operations and more frequent liquidity-injecting/absorbing operations, resulting in an increased volatility in short-term market rates.

60. **Nevertheless, such challenges in liquidity management may be mitigated by several solutions**. For example, the central bank may be able to develop better liquidity forecast as it gains more data and experience over time. Conducting liquidity operations at a fixed rate and with full allotment could also mitigate the challenges.[30] The implementation of rCBDC eligibility rules and holding limits, would influence rCBDC demand on continuous basis and mitigate the challenges. Lastly, rCBDC could be remunerated at a rate that the BoN can control and adjust. The BoN should carefully evaluate cost and benefit of these solutions.

61. **Similarly, rCBDC could complicate the BoN's FX reserve management**. As rCBDC would be central bank-issued currency like cash, the CMA's requirement for full reserves backing of physical currency would presumably apply also to rCBDC. With an FX backing requirement for rCBDC, the BoN's FX reserve needs could become more volatile, mirroring the effects on the liquidity discussed in the preceding paragraph.[31] Similar changes in the FX reserves could also take place when deposits are substituted to cash, but the substitution to rCBDC would presumably be larger and more volatile. In the case of cash substituting for rCBDC, the level of FX reserves would remain unchanged as both forms of currency would be backed by the same FX reserves.

62. **If rCBDC could be held by non-residents or used for cross-border payments, the capital account could become more open, potentially reducing the limited policy discretion that currently exists vis-à-vis the SARB.** Due to some remaining frictions to capital movements, the BoN can maintain its repo rate at a level somewhat different from the repo rate of the SARB.[32] Depending on rCBDC's cross-border payment functionalities, it has potential to simplify and reduce costs associated with cross-currency payments within the CMA, which could potentially diminish the ability to maintain the alignment between the BoN and SARB's repo rates. However, for non-CMA countries, the current exchange and capital controls that rCBDC would adhere to may limit the extent to which rCBDC opens the capital accounts vis-à-vis these countries.

63. **rCBDC remuneration would provide the BoN with a new monetary policy tool to influence the bank interest rates more directly, but its benefit in Namibia may be limited.** As rCBDC adoption may entail substitution for commercial bank deposits, the bank deposits interest rates would adjust in respond to changes in rCBDC remuneration as commercial banks seek to maintain their deposit base. The remuneration rate on rCBDC, if any, would also influence banks' lending rates.[33] However, the utility of rCBDC for this new channel may be constrained, given Namibia's current adequacy of the pass-through to the market rates. Furthermore, the real-time calibration of the rCBDC's remuneration rate could present practical challenges, as the rate must strike a balance of being sufficiently high to impact banks' deposit rates but yet not to excessively high to risk deposit disintermediation. This underscored why central banks would prefer to either a non-

[30] To alleviate the current challenges in the BoN's liquidity management, the recent IMF's mission "Monetary Operations and Lender of Last Resort" recommended that the BoN implement a fixed-rate/full-allotment instrument with a policy rate anchored to the SARB policy rate and adjusted for the Namibia country risk premium while recognizing some monetary autonomy.

[31] Furthermore, additional volatility in the FX reserves may arise when rCBDC can be used for cross border payments. If rCBDC is used for imports, monthly commercial bank net foreign transfers may fall. Under the current target benchmarks (holding other factors constant), the level of reserves would need to fall as well. However, this additional volatility may not materialize as the BoN also considers imports and short-term foreign debt service needs when calibrating the appropriate reserves level.

[32] Examples of frictions are transaction costs, convenience considerations, time lags, KYC and AML regulations.

[33] The pass-through to lending rates is theoretically less clear and would depend on the interconnectedness of the deposit and lending markets (see Armelius et al., 2018). But the fact that Namibian banks rely on deposit funding and are competitive (there are nine banks in the market) suggest that there would potentially be spillovers to bank's lending rates.

remuneration approach or a minimal remuneration with tiering to mitigate the disintermediation risk.

64. **Potential benefits from rCBDC data use and rCBDC as an unconventional monetary policy tool at the effective lower bound are of limited relevance in Namibia.** rCBDC could offer detailed insights into payment transactions, enriching data available for economic analysis.[34] However, the practical benefits of such data for shaping Namibia's monetary policy are constrained. This limitation stems from Namibia's adherence to a FX peg and the alignment of its monetary policy with that of SARB, rather than tailoring its policy to reflect its own economic conditions. Unconventional tools like helicopter drops, or conditional payments could be beneficial when the central bank needs to further stimulate the economy at times if the policy rate is at the effective lower bound. The effective lower bound; however, has not been a binding constraint in Namibia, and the tools can be implemented via other payment instruments, not necessarily via rCBDC.[35]

65. **rCBDC could help safeguard monetary sovereignty and thereby protecting the central bank's ability to effectively conduct monetary policy and to act as a lender of last resort, among other options**. Some central banks are concerned about the emergence of new forms of digital currencies such as global stablecoins or foreign CBDCs, which could lead to the risk of currency substitution and, in turn, undermine a central bank's ability to effectively conduct monetary policy and act as a lender of last resort if become widely used in their economies.[36] However, the ability to pursue independent monetary policy in Namibia has already been limited since Namibia operates under a fixed exchange rate regime. Nevertheless, there could be other supporting rationales for the BoN to consider rCBDC for preserving monetary sovereignty, including maintaining the ability to collect seigniorage, acting as a lender of resort, or maintaining Namibian dollar as a symbol of national identity.[37]

Financial Stability

Overview [38]

66. **Commercial banks are the primary mobilizers of funds for the public and the main source of financing for business and economic activities in Namibia.** As of January 2024, nine banks were licensed in Namibia: seven commercial banks, a branch of a foreign bank, and a representative office. Four large banks (three of them are subsidiaries of South African banks) hold more than 90 percent of total banking assets. More than half of bank loans are directed to residential and commercial mortgages.

67. **Deposits are the key sources of commercial banks' funding.** Around 70 per cent of banks' total liabilities are deposits, and 30 percent of the total deposits are demand deposits, while the rest is interbank funding.

68. **Bank profitability is back at a healthy pre-pandemic level.** The banking sector's profitability as measured by returns on assets and on equity ratios have improved from 2.4 percent in 2020 to 19.8 percent in 2022. Interest revenue was the primary source of income. Banks remained

[34] See forthcoming IMF Fintech Note "CBDC Data Use and Privacy Protection".

[35] In terms of monetary policy efficiency, rCBDC could, depending on design features like holding limits and fees, also raise the effective lower bound for the policy rate, thereby reducing the effectiveness of monetary policy.

[36] See Brooks (2021), BIS (2020), and OMFIF (2019).

[37] See Brooks (2021).

[38] The sources for this section are from BoN web page (in particular the Bank of Namibia financial stability report from April 2023) , IMF Country Report No. 18/77, IMF Country Report No. 23/401 and meetings with the BoN staff.

profitable in 2022 despite sluggish demand for credit, signaling a healthy and resilient banking sector.

69. **The deposit insurance scheme has been in place since February 2020**. The scheme's maximum compensation amount is N$ 25,000 (roughly $13,000), which covers more than 90 percent of depositors. The Banking Institutions Act has come into effect in 2023, which grants the BoN full banking resolution powers. However, the banking resolution framework has not yet been finalized.

Potential financial stability Implications of rCBDC

70. **rCBDC could result in bank disintermediation.** If a wide adoption of rCBDC leads to a significant shift from commercial bank deposits to rCBDC (rather than a shift from physical cash to rCBDC), leading to a decline in bank deposits. Commercial banks would be required to seek alternative, potentially more costly, funding sources. As a result, the banks may raise their liquidity coverage ratios.[39] A decline in deposits and higher funding costs could lead to a reduction in credit provision and/or raise the price of banking credits, adversely impacting the real economy.[40]

71. **rCBDC could increase the BoN's footprint on financial markets**. A shift from commercial bank deposits to rCBDC would require the BoN to engage in various kinds of maturity, liquidity, and credit risk transformation to a greater degree than it does currently, depending on the specific assets held to accommodate issued rCBDC. Should the BoN undertake such extended roles, rCBDC might result in BoN's more significant influence on lending and financial conditions within the economy.

72. **However, with the current excess liquidity in the system, these effects may be limited and could vary across banks, depending on their individual bank's liquidity conditions**.[41] In the event of an excess liquidity scenario, rCBDC's substitution for bank deposits may not severely affect the aggregate banking funding, thereby precluding the necessity for the BoN to intervene through market operations and expand its balance sheet. Nevertheless, the potential decline of deposits could escalate over time, impacting the balance sheets of both banks and the BoN. In addition, in a fragmented domestic market, rCBDC substitution could also impact individual bank's liquidity at varying degrees, which would necessitate the BoN to provide liquidity to liquidity-constrained banks even if the overall system maintains a liquidity surplus.

73. **In times of financial market distress and waning public trust on commercial banks, rCBDC may be perceived as a safe haven asset, potentially leading to a large substitution of bank deposits and an increased risk of bank runs**. While the current banking system already allows for swift withdraws from individual banks, initiating a systemic bank run — where funds are withdrawn from all banks simultaneously — remains complex and difficult. Depending on its specific features, rCBDC could simplify the process of shifting funds between banks, potentially facilitate more rapid and widespread systemic bank runs. However, in the case of individual bank runs (shifting deposits from troubled banks to more stable ones), rCBDC is unlikely to exacerbate the situation. Nevertheless, the design of rCBDC can help limit these risks, for instance, by imposing eligibility criteria or holding limits.

[39] See Juks (2020).

[40] The theory that rCBDC can improve financial intermediation may be of limited relevance in the Namibian context. In theory, rCBDC can prompt banks to raise deposit rates, in the case where competition in the banking sector is weak, and lead to increased deposit volumes. The theory also posits that the effect could be even larger if a large share of the population is unbanked (Das et al. (2023) and Panetta et al. (2022)). However, these theoretical effects may be unlikely in the Namibian setting where nine banks compete and a majority of Namibian population is already banked

[41] The IMF's Article IV (2023).

74. **As the bank resolution frameworks and the deposit insurance scheme are recently established and not fully implemented, rCBDC issuance now could result in bank run risk.** With sufficiently strong, trustworthy, and well-known bank resolution frameworks and deposit insurance, commercial bank deposits, to a certain extent, would be perceived as safe as central bank money. In that case, there will be less reason to run in periods of elevated risk aversion. However, in Namibia, the bank resolution frameworks and deposit insurance are new and untested, and the common public may not be fully aware of the risk.

B. Recommendations

75. **The BoN should assess the implications of rCBDC for monetary policy and financial stability and consider appropriate designs to limit the downside risks.** The mission identified potential downside macro-financial risks from the issuance of rCBDC. Therefore, the BoN should further conduct cost-benefit analysis as well as explore alternative solutions that could similarly achieve rCBDC's objectives, but with less associated macro-financial risks. While the risks may be mitigated through some design features such as holding/ transaction caps or remuneration, they could also affect rCBDC adoption and limit the fulfillment of the rCBDC's objectives.

76. **The BoN should strengthen capacity to forecast and manage liquidity.** Introducing rCBDC as an additional autonomous factor characterized by high volatilities would pose significant challenges to liquidity forecasting and management. The mission recommends BoN enhance its capacity and reassess the daily liquidity forecasting framework to ensure that market operations can effectively stabilize short-term market rates and facilitate policy transmission.[42] In addition, the BoN should also operationalize emergency liquidity assistance and reinforce its collateral framework.[43]

77. **The BoN should collaborate with other CMA central banks to jointly mitigate the risks of currency substitution and to revise the CMA's requirements for FX reserve coverage**. For instance, if the SARB decides to issue rand rCBDC, the potential for currency substitution could intensify in other CMA countries, including Namibia. Furthermore, the emergence of new forms of digital currency such as stablecoins and foreign CBDCs could increase the risk of currency substitution in the CMA. Close collaboration with other CMA countries would be necessary if rCBDC were to be developed to address the currency substitution threat. Additionally, the existing requirements for FX reserve coverage may be insufficient if rCBDC is issued and may require consensus-driven revisions by the CMA.[44]

78. **The BoN should enhance public awareness and trust in the deposit insurance scheme and the banking resolution framework to mitigate financial stability risks that could arise from rCBDC.** These mechanisms constitute a pivotal regulatory foundation in mitigating the risk of bank run if rCBDC leads to bank disintermediation.

[42] Consistent with the recommendations provided by the IMF Namibia 2023 Article IV Staff Report.

[43] Consistent with the recommendations provided by the recent IMF's mission for Namibia "Monetary Operations and Lender of Last Resort".

[44] Any changes to FX regulations should be aligned with the institutional view of the IMF, recently revised in IMF (2022).

V. Foundational Requirements

79. **rCBDC issuance and operation are a resource-intensive undertaking that could lead to considerable operational and reputational risks**. The BoN should build capacity and resources to manage these risks. This section assesses the readiness of foundational requirements necessary to issue and operate rCBDC at a national scale, including the BoN and PSPs' institutional capacity, the nation's ICT infrastructure and cybersecurity, as well as the legal foundations.

A. Assessment

Institutional Capacity

80. **The development and successful implementation of rCBDC necessitate a robust institutional capacity, both for the BoN and PSPs**. For the BoN, this involves building internal expertise, along with establishing the requisite regulatory and operational frameworks to manage and oversee the rCBDC ecosystem effectively. For PSPs, they must enhance their technological capabilities and adapt their operations to integrate seamlessly with the rCBDC system. This includes upgrading IT systems, developing compatible financial products and services, and training staff. Building such institutional capacity is crucial for ensuring the rCBDC system is resilient, efficient, and capable of achieving its intended objectives.

81. **The BoN CBDC working group has developed multidisciplinary skills and experiences.** Established in 2022, the working group comprises 18 members from different departments, including corporate strategy, digital transformation, IT, banking supervision, communication, and legal departments. So far, none of the group members are committed full-time to the project. The working group convened on an as-needed basis. The Strategy Projects and Change Management department serves as a project management officer role for CBDC exploration. Some members of the working group are also part of the CMA CBDC Cluster, a multinational working group between the CMA countries to collaboratively explore rCBDC in cross-border payments.[45]

82. **Issuing and operating rCBDC would require intensive resources and capacity as well as open-ended commitment to the project**. The BoN may need to bear high investment costs upfront to set up an infrastructure for rCBDC system, as well as other associated tasks such as operations, maintenance, and monitoring. In addition, building staff capacity is necessary to ensure proper functioning and governance of the system. Staff needs to have expertise not only in technology and payments but also in law, communication, and risk management. Moreover, operating a rCBDC system on a large scale, which requires instant payments for 24/7, would demand sufficient skilled resources and timely responsiveness.

4. Country experiences show that the human resources dedicated to a rCBDC project vary depending on the stage of development as well as a strategic positioning of each central bank. For example, during its peak at the launch of Sand Dollar, the Central Bank of the Bahamas employed 35 people at varying levels of time commitment and 15 people worked full-time in 2022. The Eastern

[45] The CMA CBDC Cluster initiated Project Sunbird in July 2023 with key objectives to conduct a diagnostic study and to produce a positional paper that discusses current challenges in regional cross-border payments and potential solutions including developing cross-border use of CBDCs for the CMA region. The IMF has engaged with the authorities and will provide technical assistance on the project.

Caribbean Central Bank was managing its DCash project with 12 part-time staff in 2022. The Digital Currency Institute of the People's Bank of China (PBCDCI) started developing e-CNY in 2017 and has piloted in certain regions since 2020. Currently, the institute has over 300 full-time staff with more than half as technical personnel. These numbers refer only to central bank staff, and the full amount of personnel involved on the private sector side is likely considerably larger (**Table 2**).

Table 2. Number of Central Bank Staff Engaged in CBDC Projects at End of 2021

Central Bank	Number of Staff
Central Bank of the Bahamas	15
Bank of Canada	50
People's Bank of China	300
Eastern Caribbean Central Bank	12
Sveriges Riksbank (Sweden)	20
Banco Central de Uruguay	0 (10 during pilot)

Source: Soderberg et al. (2022).

Note: This table does not include private sector personnel. Further, it does not distinguish between those working full time or part time on the CBDC projects. The reason is the difficulty in comparing the same time spent by part-time employees who, in some phases of the project, may work more than full time. Part-time employed, therefore, often means that they have other tasks beside CBDC.

- **The endorsement, resources, and capacity of banks and nonbank PSPs are also crucial to the success of the rCBDC**. Under the two-tiered operating model, PSPs would play roles in providing consumer-facing services and distributing rCBDC to the public. From interviews with some banks and nonbank PSPs in Namibia, most have moderate understanding of rCBDC and are receptive to the idea of rCBDC if it could address underserved challenges or offer unique design features such as offline functionality or open platform accessible to varieties of service providers. Some questioned the actual value propositions of rCBDC compared with other similar system or services such as IPS or mobile money services. Lastly, many indicated limited skilled resources as they have already been dedicated for the BoN's ongoing payment initiatives.

Technology Readiness

83. **Inadequacies in network, internet, and power coverage are critical barriers to the adoption of digital payment services, including rCBDC.** Approximately 48 percent of Namibians live in rural areas.[46] Owing to the dispersed population density, the investments in telecommunication and banking infrastructure, particularly in rural areas, becomes economically burdensome. As a result, a significant portion of the population encounters restricted affordability in accessing digital financial services, including ATMs, bank branches, and point-of-sale (POS) terminals. Such inadequate digital infrastructure undermines users' capacity to access and embrace digital payment services, including rCBDC. Nevertheless, the ongoing test of 5G capabilities by a major mobile network operator offers a promising support to the development of Namibia's digital readiness.

[46] National Statistics Agency (NSA) Namibia Population Projection, 2011-2041.

84. **Digital ID initiative is not yet in place to facilitate smooth onboarding and transactions for digital payment services.** Digital ID acts as a catalyst for the growth of digital financial services by mitigating frauds, improving security, accessibility, and efficiency, ultimately contributing to financial inclusion. While digital ID is not yet available in Namibia, some key commercial banks have started providing remote customer-onboarding process to improve and simplify access to its digital services by allowing customers to submit paperwork online. The customers will be initially granted limited access or functionalities to the digital banking services, but granted full access once the manual verifications are completed.

85. **Some commercial banks have identified determination of data localization requirement to locate and maintain core banking systems, including accounting and related records in Namibia, as a significant impediment to payment system modernization.**[47] This requirement is geared towards enhancing banking supervision efficacy. However, since most key commercial banks in Namibia operate as subsidiaries of South African banking groups, this requirement may inadvertently restrict the utilization of pooled resources to deliver certain services of banking group systems often hosted in data centers located outside the country. The inherent flexibility and multi-currency capabilities of these agile systems, designed to operate seamlessly with diverse currencies, could potentially facilitate the distribution of rCBDC alongside other currencies.

86. **Cloud usage restriction may hamper system scalability for rCBDC distributors.** Some banks have disclosed considerable operational constraints due to current regulatory restrictions of using cloud infrastructures. While cloud service provider exists locally, banks have stressed their inability to outsource some of their systems to external infrastructures due to such regulation.[48] In the case of rCBDC, such restriction may become a limitation for the necessary scaling of the banks' systems to accommodate the distribution and large transaction volumes of rCBDC.

87. **While commercial banks' mobile banking services seem technically agile to integrate rCBDC system, it could be challenging for the BoN, given its current IT capacity, to ensure seamless technical interoperability of rCBDC with other systems.** As the functioning of rCBDC would involve numerous stakeholders and services, ensuring interoperability between components (for example, rCBDC ledger, RTGS, wallets, intermediaries' back-end systems, analytical and conformity systems) is key to its success. For the commercial banks, which would play a key role as rCBDC distributors, appear not to exhibit constraints in managing necessary technical interoperability. Their mobile applications, client-facing protocols and core applications based on microservices architectures are technically agile enough to accommodate a new currency and the integration with the new infrastructure. For the BoN, as the operator of the core rCBDC system, it must ensure efficient APIs to the distributors, and interconnections with RTGS,

[47] Determination on localization of core banking systems (BID 19), Article 9.1: All banking institutions shall locate and maintain their core banking systems, where accounting and other banking records are kept, in Namibia to support effective banking supervision.

[48] The BoN is aware of the challenges in cloud computing restrictions, which are rooted to the requirement in BID 19 about data localization of core banking digital components. The data localization and cloud computing restrictions aimed to address risk concentration in many ways. For example, the high reliance on the technical expertise from the subsidiary group which many of the commercial banks have from their group headquarters in South Africa, by promoting localization through building and keeping local talents in Namibia. In connection to this, the BoN observed that some technical issues take time to be addressed from South Africa, and in some instances, troubleshooting technical issues occurring in Namibia may have less priority. It was also pointed out that, sometimes it is hard to get technical assistance from subsidiary banks headquarters, for instance, when it is a public holiday in South Africa.

at a minimum. While technically feasible, the operational capacity of the BoN's IT departments could be challenging and may need to rely on private contractors to provide support in system building, maintenance, and support.

88. **Achieving end-to-end scalability for rCBDC necessitates meticulous design and operational excellence at all levels of the solution, making the collaboration of BoN with the private sector a necessity and key success factor.** The collaboration with the private sector commences with the efficient development of a streamlined onboarding process, particularly addressing the unbanked or underbanked population hindered by elevated acquisition costs for traditional banks. Leveraging the substantial KYC-ed client bases of mobile operators facilitates the creation of rCBDC wallets for unbanked users. Distributors' systems, crucial for scalability, may require access to cloud infrastructure.

89. **Handling high volumes of retail transactions from rCBDC could impose an additional challenge for the BoN as a rCBDC operator.** This could pose operational complexities such as continuous 24/7 operation, monitoring and supporting core infrastructure, and managing retail-scale transaction volumes with seasonal peaks. While offline payments for rCBDC may offer a solution for central system scalability and contribute to financial inclusion, the technology supporting offline functionality is still predominantly in the research and development phase, thus is not yet production-ready for a mass adoption.

Cybersecurity Readiness

90. **The BoN is actively building its cybersecurity capacity to support secure exploration, implementation, and operations of new payment systems.** Despite having a small team (currently four cybersecurity staff), some critical cybersecurity risk management activities are in place or underway. For example, the BoN has a Security Operations Center (SOC) team that monitors the security of the BoN network during the working hours/days and engages in local and regional information sharing forums/platforms such as cyber threat intel.

91. **Robust cybersecurity awareness measures have been implemented within both the BoN and the broader financial sector, though there remain gaps for enhancing the overall effectiveness.**[49] The BoN cybersecurity awareness program is effective and involves several activities such as user trainings, phishing campaigns, and posters to reinforce users' cyber security hygiene, including active physical security controls to protect the data loss/exposure. Some entities also have cyber insurance to mitigate the impact of cyber operational failure. While the cyber awareness level is satisfactory, the interviews mentioned the lack of consistent guidance from the BoN on a cyber awareness program for both commercial banks and customers.

92. **Currently, Namibia has no platform to actively share information about cyber-attack incidents and proper guidelines on cyber risks management within the financial sector.** While major banks and a mobile network operator (MNO) appear to have 24/7 SOC and are required to report high risk cyber incidents to the BoN, there is no reliable and updated platform for

[49] Namibia has been part of the Cyber Risk Regulation and Supervision Capacity Development Initiative for 6 AFRITAC South member countries. The first part of the project focused on formulating a cybersecurity regulation and a cyber risk strategy, the second part aimed at improving the on-site supervisory cybersecurity risk examination, and the third part focused on developing cyber risk supervisory capacity. From the support provided, Namibia is seen as a good example in the region to developing a cyber security framework.

them to learn or be informed of such incidents. For example, for the Letshego Holding Ltd. cyber-attacks in Nov 2023, only some commercial banks were aware of the breach of the firewall several days post-compromise via different sources. Currently, commercial banks subscribe to regional or their subsidiary information sharing platforms, which may not necessarily cover the threats targeting or occurring in the Namibia financial sector.

93. **The cybersecurity practices for nonbank PSPs remain to be effectively regulated and enforced.** Currently, Namibia Financial Institutions Supervisory Authority (NAMFISA), while has a mandate to regulate and supervise nonbanks (including nonbank PSPs), lacks the legal mandate to enforce cybersecurity on nonbanks.[50] Instead, it adopts a risk-based cybersecurity framework to evaluate the cybersecurity practices, but such compliance for the framework is not legally enforced. Thus, the regulatory gap could expose the remaining segments of the financial sector to risks emanating from cyber-attacks targeting nonbanks.

94. **The BoN has established the Cyber Council to oversee cyber risks of other financial institutions that fall beyond the regulatory purview of the BoN and NAMFISA.**[51] The Cyber Council is in its nascent stages and is presently formulating the cybersecurity strategy and Computer Emergency Response Team (CERT) specifically tailored for the financial sector. Notably, MNOs providing financial services are subject to regulation by the Communications Regulatory Authority of Namibia (CRAN). The existence of diverse cyber regulations for various financial service providers increases the risks of cyber risk.

Legal Foundations

95. **rCBDC issuance requires a sound legal underpinning.** Most central banks are authorized to exercise and perform only the functions and powers explicitly –or at least implicitly– attributed to them. Since the issuance of rCBDC constitutes a new function for central banks, this function should be soundly underpinned in the central bank's applicable legal framework and monetary law.[52] Also, the private law aspects of rCBDC should be clearly defined to provide legal certainty necessary to support its wide adoption.

96. **The design and use cases defined for rCBDC are crucial for the legal analysis.** Considering that the BoN is exploring the issuance of rCBDC and has not decided on the specific design (i.e., token-based or account-based rCBDC), the mission flagged legal considerations on these two different design features and provided high-level recommendations. From the legal perspective, and for the purpose of this section, a rCBDC is considered account-based when, among other characteristics, there is a direct current account relationship between the central bank and the rCBDC holder. In contrast, it is considered token-based when the claim on the central bank is incorporated in a digital token and the transfer of the token equals transfer of the claim to another holder, without any current account contractual relationship between the central bank and the holder of the rCBDC.

[50] NAMFISA's Insurance Act (1998) currently does not mandate any cyber risk management of nonbanks. The Act is being reviewed, but the timeline for implementation is yet to be determined.

[51] This includes entities such as NamPost, Agricultural Bank, and Development Bank of Namibia, and MTC.

[52] In the case of the BoN, the applicable legal framework is comprised by Article 128 of the Constitution of the Republic of Namibia and the Bank of Namibia Act.

Central Bank Legal Framework

97. **The definition of currency in the Bank of Namibia Act (BoN Act) is limited to "notes and coins" and thus seems to exclude other forms of currency.** The issuance of CBDC requires, at least, the inclusion of an explicit function in the central bank organic law to "issue currency" generally, without limiting the issuance of currency to banknotes and coins, which are, by definition, physical. Although the BoN Act (Section 4(2)(b)) states that one of the BoN's functions is "to issue currency in Namibia", the definition of currency in the BoN Act restricts such function to the issuance of "notes and coins" only (Section 1).[53] All references below are to BoN Act unless stated otherwise.

98. **Moreover, the BoN's powers related to currency seem to also be limited to banknotes and coins and, hence, excluding other forms of currency.** Inter alia, Section 40 states that the Board must, with the approval of the Minister of Finance, determine the denominations, measures, weights, designs, and other features of the "banknotes and coins" to be issued by BoN. Also, Section 41 says that the BoN shall arrange for the "printing of notes and minting of coins", and all other arrangements authorized by the same section for the safekeeping, custody, and destruction of currency are explicitly limited to banknotes and coins. Further, Section 42 establishes that the aggregate amount of banknotes and coins in circulation must be a liability of the BoN and the cost of printing and minting currency must be amortized over the period that the banknotes and coins are issued. Relatedly, Section 43 clarifies that the BoN can only issue banknotes or coins in exchange for those that have been withdrawn from circulation and defines the procedure that should be followed for the withdrawal of such currency.

99. **The issuance of account-based rCBDC requires an explicit power under the BoN Act to open accounts for rCBDC holders (i.e., the general public).**[54] The legal relationship between the central bank and the holder of rCBDC is relevant from the legal perspective. If the rCBDC design involves a current account contractual relationship, then the central bank would have to be authorized to open accounts to the general public (for example, natural persons and merchants). The BoN is allowed to open bank accounts to the government and banking institutions but does not seem to be allowed by the BoN Act to open accounts to the general public.[55] This is the case of most central banks, as they are not generally authorized to open accounts to retail customers. At present, central banks are not envisioning to issue retail, account-based CBDC because of concerns raised by their direct relation with final customers, among others.

Monetary Law Provisions

100. **The BoN Act sanctioned banknotes and coins as the official means of payment (i.e., currency) through the following legal mechanisms:**

- *Legal tender status*— The BoN Act grants legal tender status to the "Namibia Dollar." Nonetheless, it explicitly states that "only such banknotes and coins issued by the Bank" and "the banknotes and coins issued by the South African Reserve Bank and serving as legal tender in the Republic of South Africa" are legal tender in Namibia (Sections 37(2) and 45(1)). Legal tender status refers to the power granted by law to a currency to validly and definitively extinguish monetary obligations. Thus, by granting legal tender status to a means of payment,

[53] It is noted that there is no provision in the Constitution of Namibia stating that currency is limited to banknotes and coins only. The Constitution stipulates that the BoN shall serve as "the State's principal instrument to control the money supply, the currency and the institutions of finance", and perform all other functions ordinarily performed by a central bank (Article 128).

[54] Account-based rCBDC could be described as a digital balance linked to specific users on the books of the central bank. Thus, account-based rCBDC would involve the usage of conventional and legally recognized banking techniques whereby transfers between accounts are affected through debits and credits of accounts, as traditional book money.

[55] According to sections 57, 59 and the definition of "account holder" in section 1 of the Bon Act.

the debtor of a monetary obligation can validly extinguish his/her obligation using that means of payment. Granting legal tender status to rCBDC might raise questions about fairness, proportionality, and financial inclusion as, currently, States cannot ensure universal access to it.[56] To address this relevant question, the legal tender status of rCBDC could be limited, for instance, by mandating that CBDC has legal tender status only for the discharge of certain obligations or for certain types of creditors (for example, government, large merchants). [57]

- *Monopoly of issuance*—The BoN Act states that the BoN "is the sole issuer of banknotes and coins in Namibia" (Section 38(1)).
- *Cours forcé*— The BoN Act implements this aspect of monetary law by stating that the banknotes and coins issued as legal tender by the BoN "must be accepted at *their face value*, in payment of all public and private debts in the country" (Section 39(a)).[58]
- *Privileges under private law and protection under criminal law*— The purpose of these privileges and protections is to allow for a wide circulation of currency. Currently, offences related to currency in Section 80 are all drafted to cover currency in physical form as well as the definitions of "counterfeiting" and "produce or reproduce" provided for in the BoN Act.

Private Law and Other Legal Considerations

101. **Token-based rCBDC requires a firm basis under private law.** The authorities should analyze aspects of private law that would govern any future token-based rCBDC, including, *inter alia*: (i) the legal categorization of rCBDC under property law; (ii) the mechanisms that enable and underpin its circulation (for example, transfer, custody contracts, security interest); (iii) the legal relationship between the holder of the rCBDC and the intermediary, which is relevant given that the CBDC should remain a liability of the central bank; and (iv) the protection of the holder in case of insolvency of the intermediary.

102. **Existing payment law(s) and applicable regulations are core.** Particularly, the authorities should assess whether licensing, regulation and supervision of PSPs cover payment services such as holding and transferring rCBDCs. PSPs offering rCBDC-related services should be adequately regulated, considering the risks involved in these new activities. Moreover, if rCBDC design encompasses access to central bank-operated payment infrastructures or other facilities by the general public and/or rCBDC intermediaries (for example, for the purpose of distributing rCBDC or clearing and settling payments), then the general public at large and CBDC intermediaries will also need to be included in the relevant law(s) or regulations as authorized participants in the respective infrastructures/facilities.

103. **The BoN should consider the legal implications of cross-border use of rCBDC within the CMA:**

- The CMA recognizes the right of contracting parties to issue "national notes and coin" -and commemorative coins-, provided that any arrangements on national notes and coin issues other than rand, are subject to an agreement between the Government of South Africa and the

[56] In the case of token-based rCBDC, in principle, some sort of technological infrastructure would be needed for accessing CBDC and transferring it. Several central banks are exploring rCBDC designs, such as a card that may be provided to users instead of these needing to own other devices. This is a relevant factor that warrants attention by the authorities.

[57] This approach is followed by the European Commission in that was published on June 28,2023. Per such draft regulation: (i) natural persons acting in a personal (i.e., not commercial) manner and (ii) small entities (defined as those having 10 employees of less or having an annual turnover of EUR two million or less, or non-profit entities) are not required to accept the digital euro (Articles 7 and 9).

[58] Section 39(b) clarifies that banknotes issued by the BoN are valid for the payment of any amount, while coins serve for the payment of any amount not exceeding 50 times the face value of the coin concerned.

corresponding issuing government. The agreement shall, among others, define the areas in which the respective currencies shall constitute legal tender (Article 2). Thus, the CMA might impose restrictions for a cross-border rCBDC issued by the BoN.

- Further, given that rand represented by banknotes and coins is legal tender in Namibia, in case that South Africa decides to issue rCBDC, it is unclear if, under the agreement, Namibia should accept such rCBDC as a valid means of payment within the country.
- The CMA mandates the development of a cross-border payment strategy to implement an integrated payment system infrastructure. Also, the CMA shall promote the harmonization of the legal and regulatory framework of payment and settlement systems (Article 7).

B. Recommendations

Institutional Capacity

104. **The BoN should continue developing internal CBDC expertise while monitoring key developments in digital payments to ensure a well-informed decision.** While the mission did not find a strong case of rCBDC over alternative solutions at the moment, this may change as technology advances, markets mature, and user preferences evolve. The mission supports the BoN's cautious approach of assessing potential use cases and policy objectives of rCBDC as the next step. Unless the net benefits of rCBDC are clear or use cases are well defined, the authorities are not encouraged to invest into an advanced-level experiment. It is crucial for the BoN to build in-house knowledge and skills on CBDC and to monitor technology and market developments in digital payments, in order to be able to make appropriate, timely and independent policy response without risk of vendor or technology lock-in. Moreover, ensuring regular communications among BoN departments will help align rCBDC exploration with other payment initiatives.

105. **The BoN should consider further participating in CBDC international forums and joining other prototype or pilot CBDC projects, to stay abreast of CBDC development**. International forums such as the IMF and WBG's Community of Practice on CBDC could be useful platforms for learning about the work of other central banks. The BoN could also consider joining CBDC projects such as mBridge[59], a cross-border wholesale CBDC project, as well as other opportunities to engage in or collaborate with the community of central banks experimenting CBDCs.

106. **The BoN should ensure that the financial and human resources allocated for the CBDC project do not hinder existing, more urgent reform initiatives before embarking on an advanced and resource-intensive phase of rCBDC development, such as a prototype or pilot.** Required capacity and resource trade-offs must be carefully assessed to ensure the development and implementation of all central bank's projects could be achieved and sustained. After all, any disruptions, even at the prototype or pilot phase, could result in negative implications on the central bank's reputation.

Technology Readiness

107. **The BoN sould influence the discussions and collaboration with respective Namibian authorities to explore the PPP and engage with development partners to address the gaps in digital and power infrastructure.** In the current setup, where the financial sector is struggling to extend financial services to Namibians, it may be challenging for the private sector to invest in telecommunication and power infrastructure without adequate incentives. PPP can be an opportunity

[59] Project mBridge experiments with a multiple-central bank digital currency (multi-CBDC) common platform for wholesale cross-border payments. It seeks to solve some of the key inefficiencies of cross-border payments, such as high costs, low speed and transparency, and operational complexities (bis.org).

to address the power and digital exclusion in the rural areas. As an example of strategic influence, the BoN is uniquely positioned to spearhead dialogues, forge partnerships, and empower relevant authorities to explore and adopt pioneering technologies, notably satellite internet services, thereby directly tackling the challenge of connectivity in remote areas. In addition, the BoN and the Ministry of Finance can engage with international development partners, such as the World Bank or United Development Program (UNDP), to enhance power, network, and internet coverage in Namibia.

108. **The BoN should collaborate with respective Namibian authorities to support the development of the National Digital ID system as an enabling public good to support digital payment services.** Digital payment systems, such as rCBDC would require a proper digital ID system implementation for identification and authentication of parties involved in payment transactions. Further, a digital ID system can facilitate many other government and private sector digital services, all beneficial for the Namibian economy. Thus, prioritizing its implementation would provide cross-cutting opportunities for many use cases.

109. **The BoN should further coordinate with stakeholders at different levels for joint efforts to support and develop any digital transformation initiatives.** By engaging with various groups of both internal and external stakeholders, the BoN can gain invaluable insights and requirements to determine appropriate technology solutions and processes for digital transformation.

110. **The BoN should carefully assess the benefits and risks of an offline functionality for rCBDC as the supporting technology continues to evolve and mature.** An offline-enabled rCBDC could be appealing as it could offer features akin to physical cash, allowing for transactions in low or no internet connectivity environments or providing a high degree of privacy and anonymity. However, this may as well favor illicit activities, such as tax evasion.

111. **The BoN should take the opportunity with rCBDC exploration to review specific regulation about data localization requirements.** The review should comprehensively consider the efficiency, effectiveness, and risks considerations for the financial sector in Namibia.

Cybersecurity Readiness

112. **The BoN should take further measures and review relevant regulations to ensure effective cyber risk management.** While there have been notable initiatives and a sound progress to address cyber risks in the financial sector, there remains scope for implementing additional measures to further enhance cybersecurity. For example, the BoN can collaborate with potential stakeholders such as NAMFISA to ensure effective cyber risks supervision and oversight in the entire financial sector, and to incorporate cyber risks management for the nonbanks. Similarly, during the establishment of the Cyber Council, the BoN should ensure effective cyber risks management for PSPs that are not currently covered by the cyber regulations. Furthermore, the BoN should collaborate with the government to ensure that there are provisions in the law to combat cybercrimes activities, as well as privacy and data protection requirements in data protection laws to address the privacy concerns introduced by digital payment systems such as rCBDC.

113. **The BoN should establish and promote the cyber information sharing platform for the financial sector.** The financial sector needs to be monitored around the clock. This requires building a strong 24/7/365 cyber' SOC to monitor the financial sector infrastructure, identify threats, and respond to or recover from successful cybersecurity attacks. Implementing the cyber threat information sharing platform will assist the financial institutions to learn and manage incidents happening in the financial sector proactively or reactively.

Legal Foundations

114. **The BoN's mandate would need to be amended to enable it to issue rCBDC, if there were a policy decision to issue rCBDC:**

- The definition of currency in the BoN Act would need to be modified to additionally cover currency in digital form. All other applicable provisions relative to currency that exclusively refer to banknotes and coins, should also be amended.
- If BoN decides to issue account-based rCBDC, the BoN Act should authorize the BoN to open current deposit accounts to the general public and NBFIs in case the latter is also envisaged under the specific CBDC design.

115. **Monetary law provisions in the BoN Act would require amendments for rCBDC issuance:**

- *Legal tender status*—if it is decided to grant legal tender status to a rCBDC, the BoN Act would need to clarify that the Namibia Dollar is not only represented by currency in material form, but also in immaterial, including digital, form. Also, in line with the CMA, the BoN should consider whether legal tender status should also be granted to currency in digital form issued by the South African Reserve Bank, should that be the case.
- *Monopoly of issuance and Cours forcé*— The BoN Act would need to be amended to give BoN the monopoly of issuance of all forms of currency, including currency in digital form. For the issuance of rCBDC, the provision establishing that banknotes and coins must be accepted at their face value would need to cover all forms of currency as well.
- *Protection under criminal law*—These provisions would need to encompass all forms of currency and not only currency in physical form. Moreover, the BoN should review whether crimes such as digital counterfeiting and hacking are under the scope of cybercrime offences.

116. **The BoN should assess the private law and payments law aspects of token-based rCBDC to provide this new form of money with the required legal certainty.** In case that the key private law aspects of token-based rCBDC need to be developed, legal reforms might be needed. Moreover, the BoN should review the agreements that the BoN may enter into with technology providers relating to the design and deployment of rCBDC. Further, the payments law and regulations should be closely reviewed to ensure that they allow for rCBDC operations.

117. **The BoN should address central bank governance issues arising from the issuance of rCBDC.** Considering that the issuance of rCBDC impacts central bank policy formulation, executive management and internal oversight, the authorities are encouraged to identify any additional reforms that might be required to the BoN Act and BoN's internal policies and procedures to adapt its governance structures, internal organization, and risk management function to the additional responsibilities and operational and reputational risks associated with rCBDC issuance (BIS 2020).

118. **The BoN should review the CMA and additional relevant legislation if there is a decision to develop a cross-border rCBDC.** The BoN should examine with CMA contracting parties its authorization to issue rCBDC and whether a digital rand would have legal tender status in Namibia and other contracting parties. Moreover, *inter alia*, the BoN would need to assess whether it is legally authorized to enter into multilateral CBDC agreements and the provisions on payment system finality rules, data sharing and/or data privacy constrains, which would need to be converged with those of the countries involved in the multilateral CBDC agreement for the interlinking of payment systems. Legislation on exchange control, capital flow management, and conflict of laws issues should also be reviewed and converged, if needed.[60]

[60] Any amendments of FX regulations should be aligned with the IMF's Institutional View on the Liberalization and Management of Capital Flows.

VI. CBDC Project Management and Roadmap

119. **The BoN has recently made significant steps towards modernizing the payment and financial systems.** Along with other several initiatives discussed in Namibia National Payment System (NPS) Vision and Strategy 2021-2025, the rCBDC exploration constitutes as one of the strategic efforts to assess opportunities from new technologies to further foster digital payments in Namibia.[61]

120. **The BoN published a consultation paper on rCBDC in October 2022 with key objectives to provide initial policy considerations and gather public opinions.** To date, nine respondents have expressed varied perspectives on rCBDC. Some acknowledge its potential to provide more cost-effective and inclusive digital payment tools, while others raise concerns about its implications on monetary policy and the possibility of banking disintermediation.

121. **In addition to the mission's engagement in feasibility assessment for rCBDC, the BoN is seeking to develop a roadmap as a guideline for determining appropriate actions and milestones for rCBDC exploration.** The roadmap development will be based on the findings and recommendations from the feasibility assessment to ensure that the key milestones identified in the roadmap are well aligned with the identified value propositions of rCBDC.

122. **As undertaking a rCBDC project would inevitably require engagements from multiple stakeholders internally and externally, onboarding the stakeholders in the process of drafting the CBDC roadmap is crucial.** Given the BoN's early stage of CBDC exploration, internal discussions, and agreements on next steps among the BoN's relevant staff, both from the working and the management levels, should be arranged before any communication and engagements with external stakeholders. Continuous knowledge sharing and support from key departments would help ensure all relevant opinions and factors are appropriately incorporated into the roadmap.

A. Approach

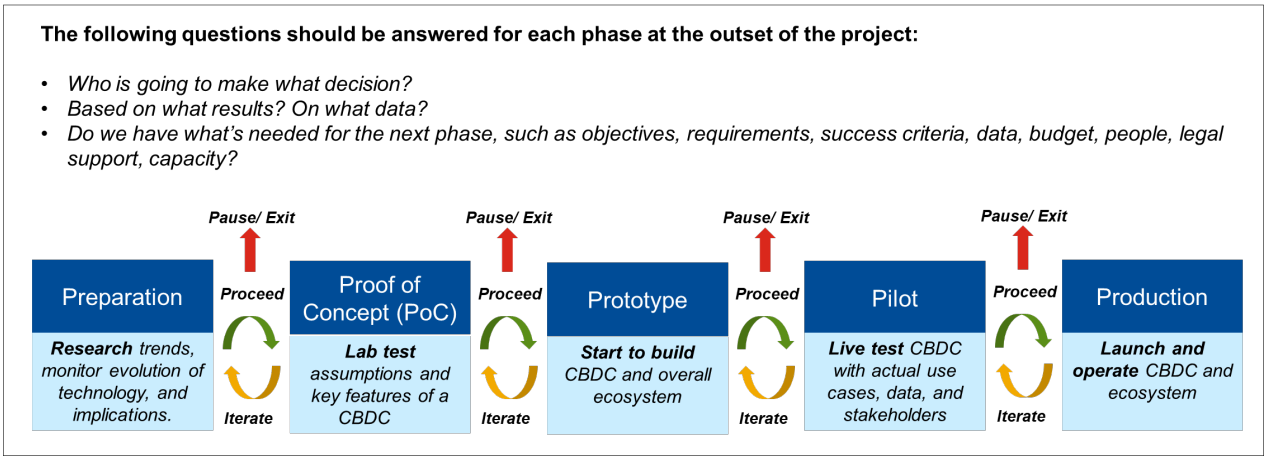
5P Methodology

123. **The IMF has developed the '5P' methodology as a framework to help central banks manage CBDC research, experimentation, development, and operations.** The framework offers iterative, phased approach in managing highly experimental digital projects such as CBDCs to ensure the product development is well aligned with the policy objectives and business use cases. The 5P consists of five phases: Preparation, Proof-of-concept, Prototypes, Pilots, and Production. All phases need predetermined go/no go governance to decide whether to iterate to the same phase, proceed fully to the next phase, proceed partially, or stop the project (Figure 11). [62]

[61] Namibia National Payment System Vision and Strategy 2021 - 2025

[62] For more details on the 5P methodology, please refer to the IMF's Fintech Note: A Guide to Central Bank Digital Currency Product Development.

Figure 11. The 5P Methodology



124. **Since the BoN is at an early stage, the draft of the roadmap will focus on Preparation phase, which emphasizes identifying key questions related to CBDC such as policy goals, potential use cases, cost and benefits, capacity assessment, etc.** Key steps identified in the Preparation phase have been already taken by the BoN such as organizing the working team and conducting initial research with the publish of the consultation paper. Therefore, the roadmap will involve addressing remaining key questions and milestones to ensure the BoN can make a well-informed decision on rCBDC's direction, such as moving forward to a more advanced phase of the exploration if deemed suitable.

Design Thinking Workshop

125. **The mission team conducted a design thinking workshop which adopts a Human-Centered Design (HCD) approach to draft a rCBDC exploration roadmap**.[63] As rCBDC project will be driven by BoN's internal motivations as well as the external stakeholders' demand, the HCD approach can support the BoN to collectively gain better understanding of the root causes of existing challenges faced by different stakeholders and how rCBDC could potentially serve as a valuable and appropriate solution. The approach also aims to support a collaborative decision-making among different departments and empower the working team to formulate the roadmap suitable for the BoN's priorities and resources.

126. **The workshop was structured to consider the mission's recommendations.** The workshop was set up for two days with each session running for 3 hours. There were 12 participants from the BoN's CBDC working group. The structure of the design thinking workshop started with an opening discussion on the identified challenges and key potential use cases of rCBDC, followed by brainstorming on areas of exploration, action plan, and key required resources needed in short and medium terms.

127. **The roadmap development is a collaborative work which rests on the policy objectives agreed by the working and the management levels in the BoN**. Built on a problem-driven principle from HCD approach, the design thinking workshop serves as an effective tool to help ideate and reach a collective consensus from people across disciplines. The participants jointly explored and developed an actionable plan for the next stage of CBDC explorations, specifying key

[63] For more details about the workshop process, please refer to Appendix I.

activities and tangible output for each phase, and identifying relevant resources. The key activities were then assigned priorities and timelines and incorporated into a roadmap.

B. Draft Roadmap for rCBDC Exploration

128. **The draft of the roadmap developed during the workshop serves as an initial guide for the BoN, offering a foundational input for subsequent refinements aligned with its specific priorities and timelines.** Emphasizing an iterative process, the roadmap is designed to evolve and adapt, ensuring it receives support and approval from both management and working levels. This approach allows for flexibility and responsiveness of the rCBDC exploration to changing circumstances while maintaining alignment with organizational goals.

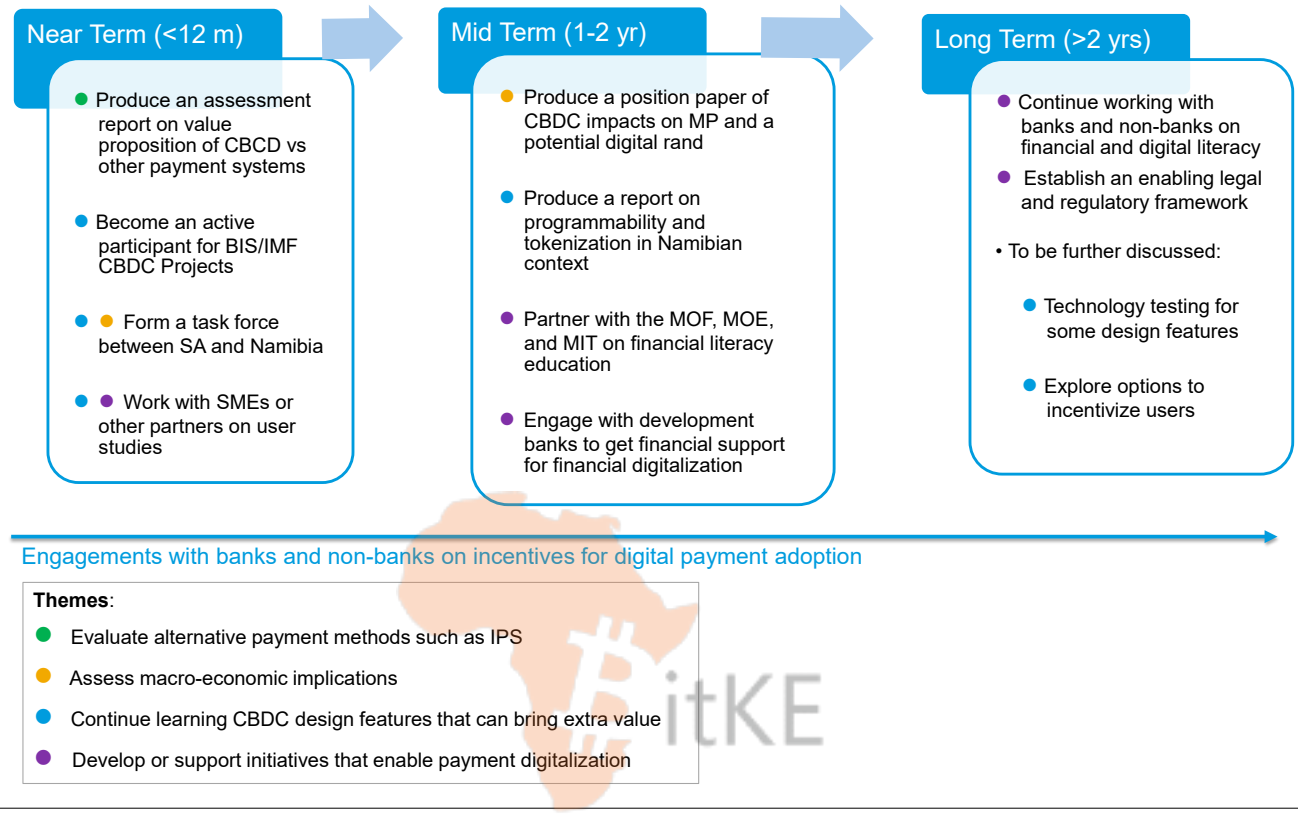
129. **Building on the mission's initial assessments and recommendations, the working group defined key actions and milestones.** They were grouped into four themes: (1) evaluate alternative payment methods such as IPS; (2) assess macro-economic implications; (3) continue learning CBDC design features that can bring extra values; and (4) develop or support initiatives that enable payment digitalization. The prioritization of identified actions and milestones is determined through a collaborative consensus within the team, considering the perceived values and efforts associated with each of these elements.

130. **As an outcome from two-day roadmap workshop, the draft roadmap incorporates three general phases of the BoN's rCBDC exploration and their respective key activities/output (see Figure 12):**

- **Short term (within 12 months)**: after the IPS is launched, the BoN aims to assess its impact from various aspects with success metrics as well as other implications such as legal, fee structure, cross-border payments, and opportunity cost of not issuing a rCBDC. The assessment report will also develop success metrics and factors for a modernized financial system in Namibia and map the items to evaluate payment systems and rCBDC. Meanwhile, the working group also seeks to participate more actively in rCBDC projects or learning communities led by the IMF and the Bank for International Settlements (BIS). Given the close interconnection between South Africa and Namibia, the working group also proposes to establish a task force between the two countries to get timely information on South Africa's plan on digital rand and its potential impact on Namibia. Meanwhile, the BoN will begin to leverage partners (for example, SMEs and Chamber of Commerce) on user studies (for example, research, roadshow) to gauge public interests' in rCBDC.
- **Medium term (within 12 to 24 months)**: the BoN will focus on tackling more advanced topics related to CBDC. The BoN considers developing two reports on: (1) the impact of CBDC on Namibia's monetary policy, which also covers impact from the introduction of a potential digital rand; and (2) how to leverage rCBDC's programmability and explore tokenization use cases in the Namibia context. Public consultation of these reports will be also conducted. During this stage, the BoN will also engage domestic (for example, Ministry of Finance, Ministry of Education) and international partners (for example, the World Bank) to address some of the root causes for financial inclusion such as improving financial literacy education and digitalization. Some examples discussed by the team included incorporating financial knowledge into high school curriculum, launching targeted education campaigns in rural areas, or getting financial assistance for digital infrastructure building.
- **Long term (over 24 months)**: the BoN will continue working with banks and nonbanks to improve Namibians' financial and digital literacy. However, the timing and priority of conducting technology tests and exploring incentive options for rCBDC are yet to be determined and will depend on the findings and conclusions from studies in earlier phases.

During each of the phases, the team also agreed to engage with the private sector players (for example, banks, e-money issuers) on identifying their incentives to participate in the rCBDC system.

Figure 12.The BoN's Draft Roadmap for rCBDC Exploration



C. Recommendation

131. **The BoN should continue refine the draft of the roadmap and engage with other BoN's internal departments and external stakeholders to ensure consistencies in policies, resource allocation and timeline.** As digital payments and technologies are rapidly evolving, it is imperative that the CBDC roadmap stays flexible and adaptive to the changing environments. To foster a cohesive and coordinated approach, the BoN should engage in ongoing collaboration with internal departments and external stakeholders identified during relevant workshops. To do so, the BoN should actively seek input and feedback for the CBDC roadmap. This inclusive approach would ensure buy-in from all relevant parties as well as a collective understanding and endorsement of the roadmap. This collaborative effort will serve to eliminate inconsistencies in resource allocation and timelines, promoting a unified front in the pursuit of CBDC objectives with other BoN's projects and policies.

VII. Conclusion

132. **The mission assisted the BoN in laying groundworks for the feasibility study of rCBDC and drafting the roadmap of rCBDC exploration in Namibia.** It provided a holistic evaluation by analyzing potential value propositions of rCBDC to enhance payment systems and financial inclusion while also assessing alternative non-CBDC solutions. In addition, the mission examined the implications of rCBDC for monetary policy and financial stability. In addition, the mission evaluated foundational requirements needed if the BoN decided to issue rCBDC. This assessment factored in the implications of Namibia's membership in the CMA for rCBDC issuance.

133. **The mission did not find a compelling case for rCBDC issuance at this juncture.** rCBDC offers promising benefits for payments and financial inclusion mainly through the functions of instant and affordable payments with central bank money, offline payments, and innovative digital financial services. Nevertheless, a wide array of non-CBDC alternatives could serve as low-hanging fruit solutions and require less efforts to implement. In addition, there appears to be downsides from macro-financial implications in the case of Namibia. Thus, taken all together, the net benefits from rCBDC are likely to be marginal at the moment.

134. **Nevertheless, the mission recommended the BoN continue developing in-house expertise in CBDCs and digital payments.** While it was not recommended to immediately pursue a resource-intensive experiment on rCBDC, the case for rCBDC could emerge in the future when markets and technologies become sufficiently mature. Thus, the BoN should continue research and monitor the development of digital money while remain engaged with other CMA countries.

135. **Finally, should the BoN opt to issue rCBDC in the future, more efforts are needed to meet foundational requirements.** Resources must be sufficiently allocated without hindering urgent reforms. Addressing critical gaps in ICT infrastructure and cybersecurity is essential, along with amending the legal framework for comprehensive legal certainty across all relevant areas.

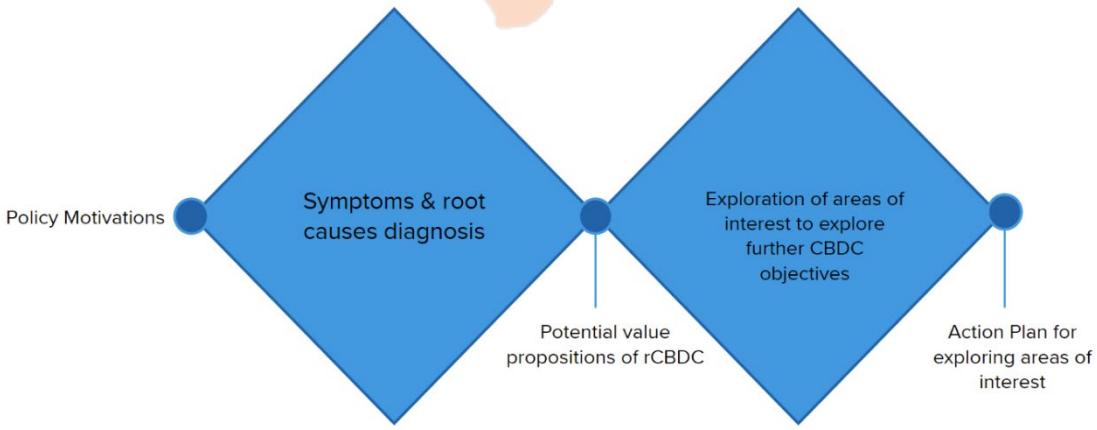
Annex: Description of Methodologies for the Roadmap Workshop

The mission involved conducting two workshops with the BoN's CBDC working group, aimed at collaboratively developing a high-level roadmap for exploring the foundational elements of their rCBDC. These workshops were meticulously designed in partnership with the mission team and with the IMF's Corporate Services and Facilities (CSF) Department's Creative Lab, responsible for promoting the adoption of Human-Centered Design (HCD) and design thinking methodologies within the IMF's scope of work.

Employing HCD and design thinking principles, the mission team orchestrated two days of collaborative workshops, actively involving the BoN staff. This strategic approach was chosen for its ability to mitigate adoption risks by deeply understanding user needs, identifying barriers, and fostering engagement within the ecosystem. In addition, the format of the design thinking workshops enabled an environment of collaborative consensus building in which participants were encouraged to broaden their thinking and welcome differing opinions. Participants included staff from across the central bank to ensure a diverse and multi-disciplinary perspective.

Adhering to the HCD approach, the team utilized a Double-Diamond model as the guiding framework for the design process, tailored specifically for the country's rCBDC exploration. The mission's outcome was a draft of the roadmap with integral high-level action plan consisting of three phases and 12 key milestones.

Figure 13. The Double-Diamon Model of Design Thinking



These outcomes stemmed from a process of divergence and convergence, as delineated by the double-diamond model (Figure 13). Initially, the mission team delved into understanding the myriad root causes and symptoms within the Namibian payment ecosystem. This comprehensive analysis enabled them to identify the potential value propositions where rCBDC could play a pivotal role.

Overall, the workshops fostered a collaborative spirit among the various departments of the bon, emphasizing the collection of inputs from diverse perspectives in an open and horizontal manner. simultaneously, the workshop methodology aimed to provide hands-on capacity building, equipping the

BoN team with tools and methodologies to enhance their utilization of HCD and design thinking. These approaches are invaluable for subsequent stages of the rCBDC exploration, design, and pilot, facilitating a more multidisciplinary and holistic process.

Day 1: Identify Areas of Exploration (Tuesday January 30, 2024)

Figure 14. High-Level Agenda for Day 1 Workshop

Section	Workshop Intro	Findings Presentation + Discussion	Workshop: Areas of Exploration
Goals	Introduce the nature of workshops	• Present the summary and findings of Phase I • Validate if the proposed Potential value propositions of rCBDC that are relevant for the CB team	• Identify the areas or elements to be better understood for the Potential value propositions of rCBDC.
Output	Alignment on expectations	• List of value propositions to be explored iterated with the Central Bank team.	• Clusters of areas of interest or elements to be better understood.
Suggested Duration	15m	60 minutes	60 minutes

Framework: Structured Brainstorming

Aim: This reflective exercise aimed to cultivate creative collaboration by leading participants through a systematic and organized ideation process. It focused on surfacing the essential elements and unanswered questions the Central Bank needs to explore for a comprehensive understanding of how CBDC could benefit the country. The framework guided individuals in generating diverse ideas, promoting thoughtful exploration of specific rCBDC's value propositions, and facilitating the identification of common themes among team members' ideas.

Method and Results: Following a Discovery Findings Presentation by the mission team, which introduced and discussed the potential rCBDC value propositions, participants engaged in a reflective exercise. Everyone was prompted to ponder the question: "*What are the key questions we need to explore / understand about the potential areas of rCBDC exploration?*" To foster a robust discussion, the mission team encouraged participants to broaden their thinking and consider questions of varying complexity and focus.

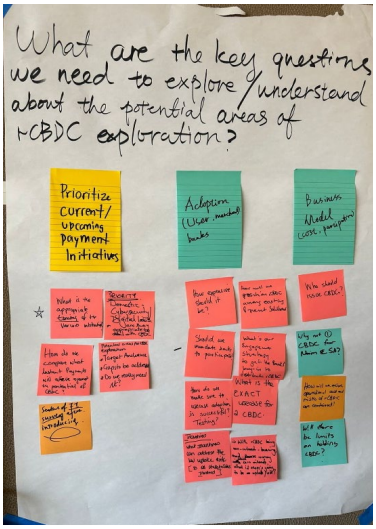
Upon the conclusion of the allocated time, participants shared their areas of interest or questions areas of interest. The mission team adeptly grouped akin ideas as participants contributed, pinpointing emerging topics pertinent to Namibia's context. This iterative process facilitated the organic emergence of thematic clusters, enriching the discussion and providing a comprehensive exploration of the areas to be explored associated with the potential rCBDC value propositions.

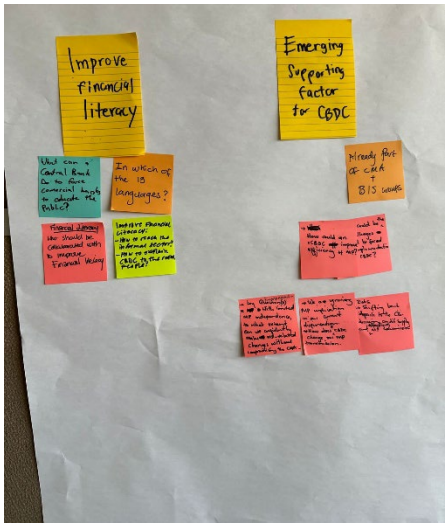
As a result, four main areas of interest were identified: 1) evaluating alternative payment solutions such as IPS, TCIB; 2) continue learning on CBDC design features especially the ones that could potentially bring *extra* values; 3) evaluate and assess the macro-economic implications; and 4) Develop/ provide initiatives that could help on supporting payment digitalization including CBDC. The workshop dynamic enabled the team to develop a comprehensive perspective on the areas and angles that need exploration for the

rCBDC. This holistic approach allowed the BoN to gain a broader understanding of the project's scope and implications across various domains. Moreover, throughout the workshops, the team proactively engaged with the IMF, seeking valuable insights from country references and case studies to leverage the experiences of other jurisdictions in addressing similar areas of interest.

Figure 15. Day 1 Workshop

Figure 16. Day 1 Workshop





Day 2: Brainstorming Activities and Building the Roadmap (Wednesday January 31, 2024)

Figure 17. High-Level Agenda for Day 2 Workshop

Section	Recapitulation	Workshop: Brainstorming Activities	Break	Workshop: Building the roadmap
Goals	• Present a summary of the previous Day and the final clusters	• Outline the set of activities across the Central Bank to be developed to achieve areas of discovery.		• Establishing the appropriate sequence of activities on a timeline necessitates prioritizing tasks across short, medium, and long-term horizons, factoring in dependencies and effort levels to ensure optimal order
Output		• List of activities that will serve as starting point to build the roadmap.		• Visual representation of the activities grouped by Phases where responsibilities and resources across the different teams are identified.
Suggested Duration	20 minutes	70 minutes	15 minutes	60 minutes

Framework: Developing a Roadmap

Aim: Having understood from the previous day which areas and elements of CBDC the BoN considered to be most crucial to explore, the aim of the second day was to determine their path forward. The participants sought out to identify what set of activities would need to move in a structured manner through their exploration of those areas, while at the same time, determining what dependencies and workstreams are linked to those activities. This resulted in a map of next steps enabling the BoN to move toward the implementation phase.

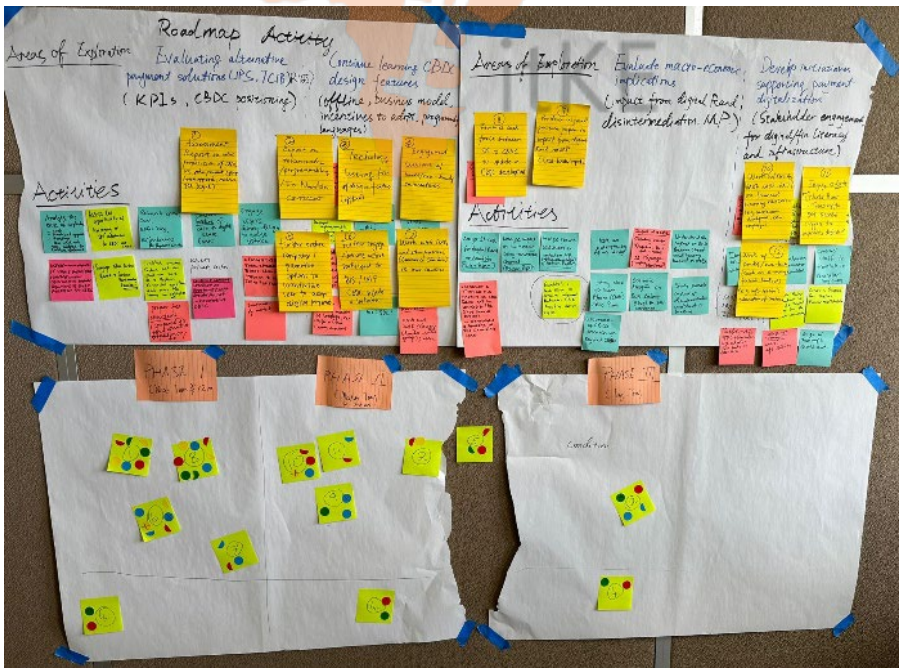
Method and Result: Following a recap of the previous day's discussions and an overview of the four main clusters of areas to be explored, participants engaged in a brainstorming session to delineate the various activities necessary for a comprehensive understanding of the topic or area at hand. These activities were required to be tangible, paving a clear path for actionable steps by the Central Bank.

Subsequently, the team meticulously organized and prioritized these activities into a matrix where Level of Effort and Impact were assessed for each activity, focusing on those most pertinent for the initial stages and those with dependencies for later phases. To ensure the roadmaps were comprehensive of the different areas and roles of the BoN, the group tagged each activity according to the nature of the task: legal, design, technology, risk management, and stakeholder engagement.

Following completion, the team crafted a roadmap comprising three distinct timelines: Phase I for short-term objectives, Phase II for medium-term goals, and Phase III for long-term aspirations. This collaborative effort not only assigned activities but also empowered team members to voluntarily undertake roles and responsibilities, nurturing a profound sense of ownership and commitment crucial for the endeavor's success.

Figure 18. Day 2 Workshop

Figure 19. Day 2 Workshop



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