



**Standing Committee  
for Economic and Commercial Cooperation  
of the Organization of Islamic Cooperation (COMCEC)**

*20th Meeting of the COMCEC Financial Cooperation Working Group*

*10th October 2023*

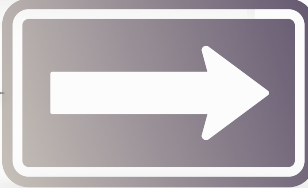
# **Improving Cooperation among Central Banks in terms of Digital Currencies: Challenges and Prospects for OIC Member Countries**

**Session 2:  
Case Studies**

Presented by: Dr.Adam (Ruslan Nagayev)

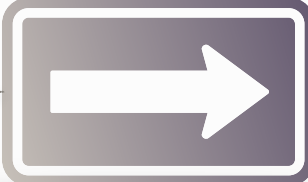
# TABLE OF CONTENTS

## Country Cases Overview



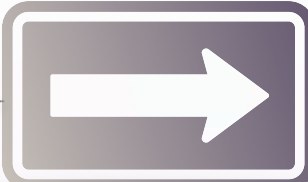
### Case 1: Indonesia

- ❖ Group: **Asian**. OIC Membership: **Yes**
- ❖ Legal System: **Mixed (Shariáh & English Common Law)**



### Case 2: Nigeria

- ❖ Group: **African**. OIC Membership: **Yes**
- ❖ Legal System: **Civil Law**



### Case 3: Pakistan

- ❖ Group: **Asian**. OIC Membership: **Yes**
- ❖ Legal System: **Mixed (Shariáh & Civil Law)**



### Case 4: Qatar

- ❖ Group: **Arab**. OIC Membership: **Yes**
- ❖ Legal System: **Mixed (Shariáh & Anglo-Saxon Law)**



### Case 5: Singapore

- ❖ Group: **Asian**, OIC Membership: **No**
- ❖ Legal System: **Common Law**

## Survey Results Review

## Concluding Remarks



# CASE 1: INDONESIA



# CASE 1: INDONESIA

## KEY FACTS

❖ **Population: 270.2 mln**

Source: Indonesian Bureau of Statistics

❖ **Mobile phone ownership:**  
❖ **133%**

Source: Bank Indonesia

❖ **Internet penetration:**  
❖ **68% of population**

Source: Statista, 2021

❖ **Mobile internet users:**  
❖ **74% of population**

Source: Bank Indonesia, 2022

❖ **Internet subscribers:**  
❖ **67% of population**

Source: Kemp, 2022

❖ **Social media users: 69% of population**

Source: Bank Indonesia

- ❖ Fast-Growing Economy in the ASEAN region
- ❖ **Digital Rupiah:** A sign of dawning of a new financial era
  - ❖ BI issued white paper on 30 / 11 / 2022
  - ❖ Under the hood of “**Project Garuda**”
- ❖ The **Digital Rupiah** presents a compelling case study for national scale initiative that requires synergistic efforts in its formulation and implementation.



# CASE 1: INDONESIA

## KEY FACTS

◆ **GDP growth rate: 5.2%**

Source: Statista

◆ **Monetary policy rate: 7.5%**

Source: Bank Indonesia

◆ **Inflation: peaking at 9.3%  
as of March 2023**

Source: Indonesian Bureau of Statistics

## MONETARY SYSTEM

- The BI has been proactive in response to these multifaceted economic challenges.
- Key objective of BI's monetary policy: stabilizing the economy by neutralizing the impacts arising from volatilities in both the global and local economic milieus.
- This entails a dual approach: adjusting the monetary policy and revamping the payment systems in the context of the Digital Rupiah's impending implementation.



## CASE 1: INDONESIA

- ❖ BI has set its sights on broader payment system reforms aiming to enhance the technological backbone of electronic payments.
- ❖ BI embarked on the innovative journey of conceptualizing **Digital Rupiah**. This initiative parallels Indonesia's concerted efforts to strengthen its payment system infrastructure, deepen financial inclusion, and combat shadow banking challenges, thus promoting a holistic digital financial ecosystem.
- ❖ BI's "**Project Garuda**" symbolizes the country's aspirations in these transformative times.
- ❖ **Digital Rupiah** - as an official digital payment method in Indonesia, serving as a cornerstone tool for the Bank's contemporary mandates, being a conduit for financial inclusivity, technological innovation, and holistic efficiency.



# CASE 1: INDONESIA

## 3 Key Drivers

- 1 The necessity of BI as the sole authority in issuing local currency to respond to rapid development of digital economy and finance, in this case by issuing Rupiah currency in digital form.
- 2 The effort of BI to strengthen its role on the international stage. **Digital Rupiah** will put Indonesia on the world map of CBDC development, alongside other countries.
- 3 The need to accelerate integration of national digital economy and finance. That's to ensure effective and integrated money supply process between digital economy and finance ecosystem and the existing economic structures.

## FRAMEWORK OF DIGITAL RUPIAH

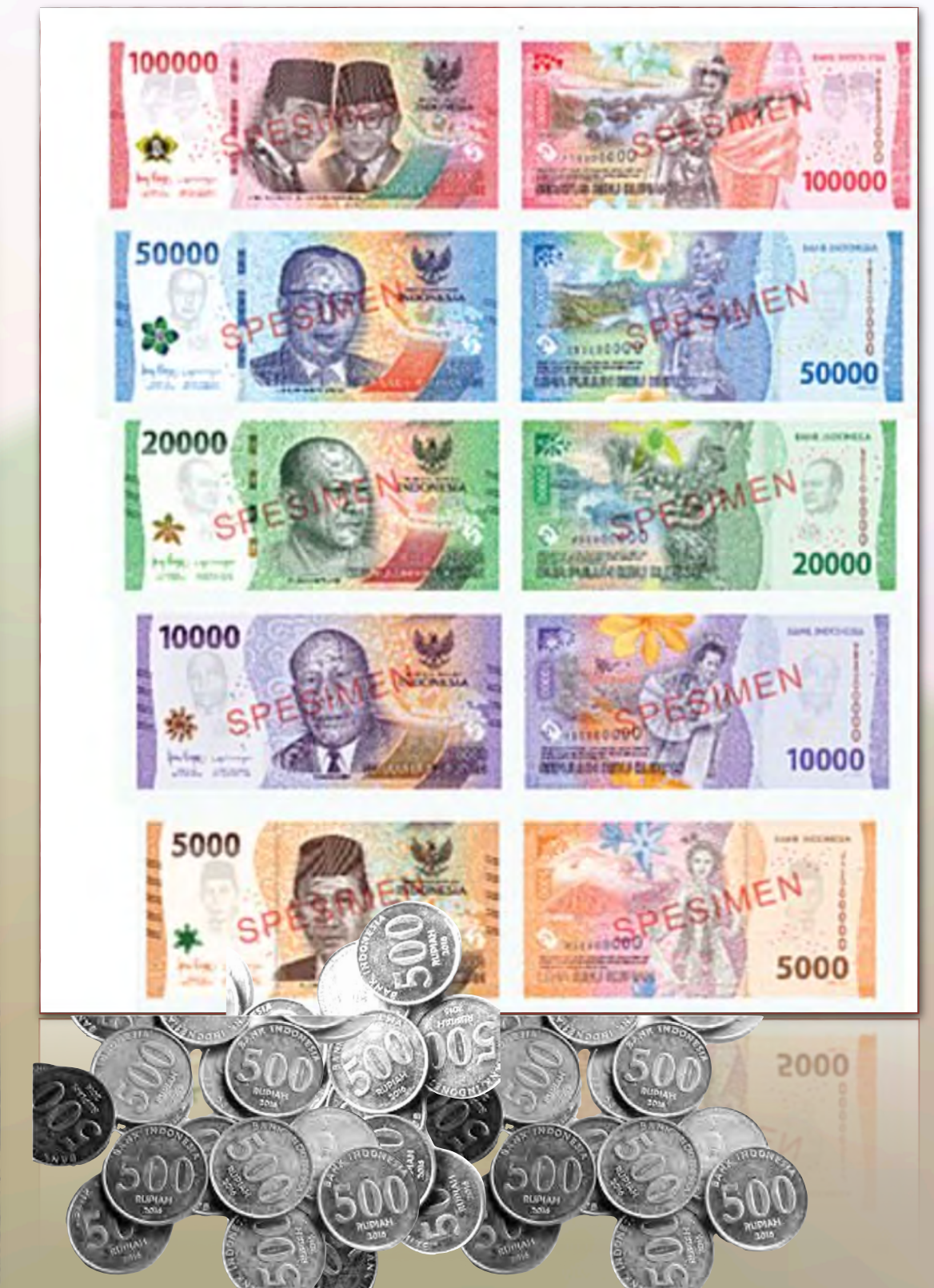




# CASE 1: INDONESIA

## LEGAL AND REGULATORY FRAMEWORK

- ❖ **Digital Rupiah**, supported by the overarching legal frameworks of Indonesia, is established as a digital legal tender regulated by BI.
- ❖ The BI's authority to issue such currencies is granted by Act No.23 of 1999 as amended by the Act No.6 of 2009
- ❖ In tandem with these legislative and operational guidelines, **Project Garuda** is a pioneering initiative that emphasizes **Digital Rupiah's** stature as a digital legal tender.
- ❖ Through **Project Garuda**, BI envisions **Digital Rupiah** as the premier digital payment method in Indonesia, allowing to fulfill the legal duties in this digital era.

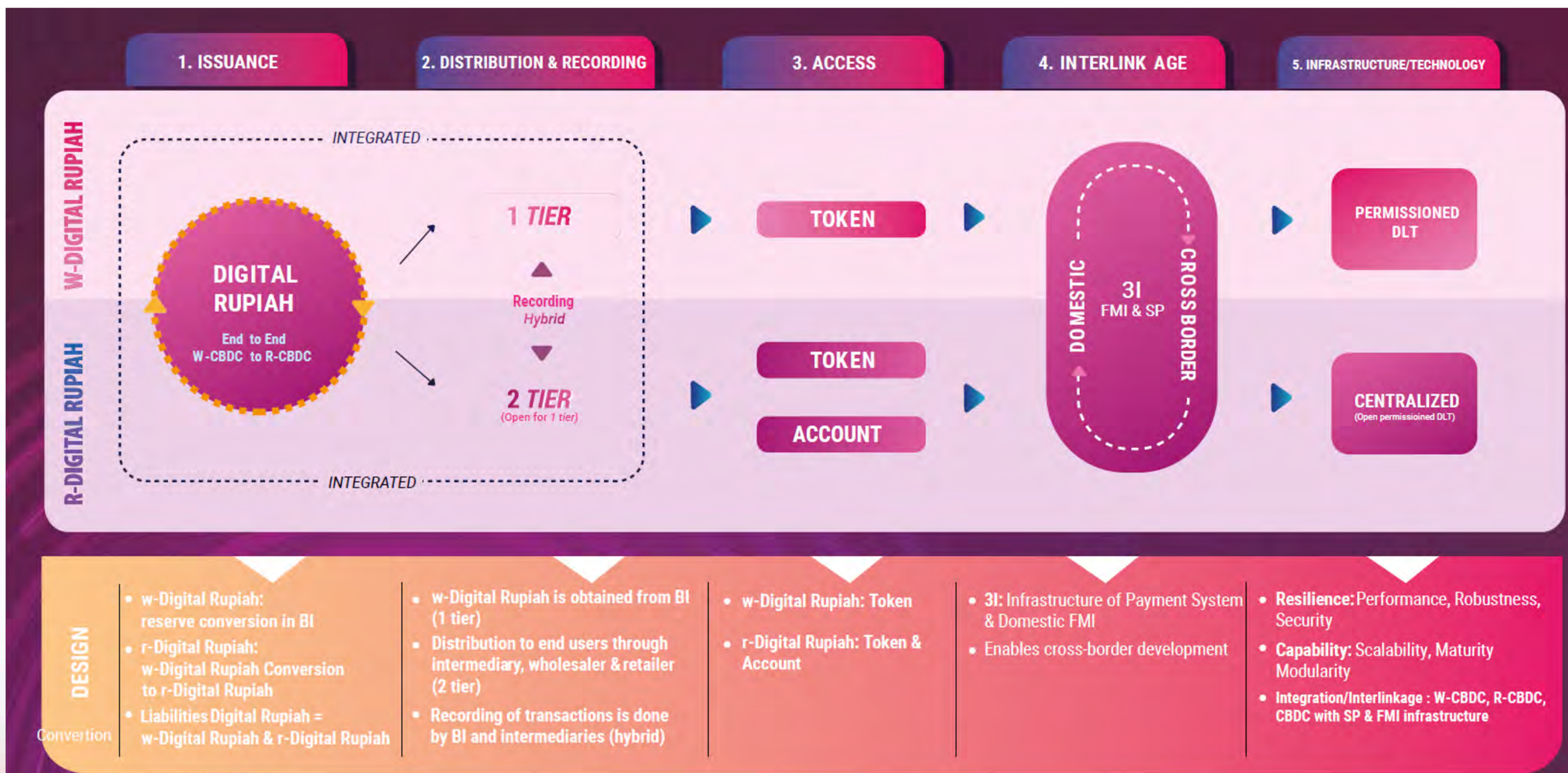






# CASE 1: INDONESIA

## DESIGN CONFIGURATION OF THE DIGITAL RUPIAH



❖ Determining appropriate design configuration is an essential part in **Digital Rupiah** issuance.

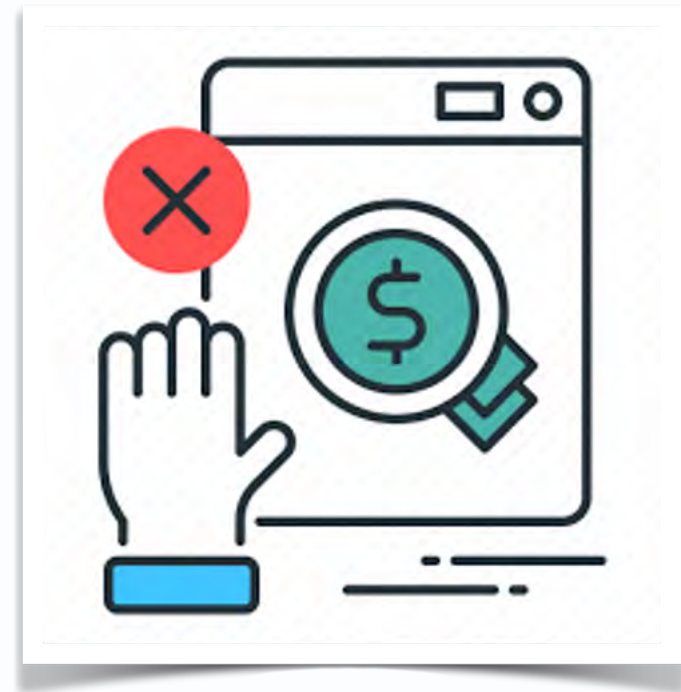
❖ **Digital Rupiah** design configuration consists of five main elements:

1. Issuance
2. Distribution and recording of transactions
3. Access
4. Use cases and interlinkage
5. Infrastructure and technology



## CASE 1: INDONESIA

### ANTI-MONEY LAUNDERING AND COMBATTING FINANCIAL TERRORISM (AML/CFT)



- ❖ The design and roll-out of **Digital Rupiah** emphasize unwavering compliance with AML / CFT guidelines.
- ❖ **Digital Rupiah** is bifurcated into two access models: account-based and token-based. The token-based variant offers granular data on transactions through information archived on the wallet addresses. This promotes a higher degree of oversight and ensures a more controlled and transparent transactional environment.
- ❖ The BI's layered approach to **Digital Rupiah**, emphasizing both token- and account-based models, seeks to address common AML / CFT concerns inherent in CBDCs.



## Rate of Adoption

- ◆ 2 primary formats of **Digital Rupiah**: wholesale (w-Digital Rupiah) and retail (r-Digital Rupiah).



### w-Digital Rupiah

- ◆ **w-Digital Rupiah** being prioritized at the outset to establish a foundational basis for the entire **Digital Rupiah** ecosystem
- ◆ Specifically, **w-Digital Rupiah**'s incorporation into the wholesale market is poised to catalyze the advancement of financial markets and seamless integration of the digital economy and financial systems

### r-Digital Rupiah

- ◆ **r-Digital Rupiah** is designed to cater to the broader public, serving a function akin to conventional banknotes and coins
- ◆ Importantly, the repercussions of the **r-Digital Rupiah** issuance on the financial ledgers of BI, commercial banks, and non-bank e-money issuers are anticipated to mirror the extant procedures governing the transition from bank deposits or e-money balances to physical currencies

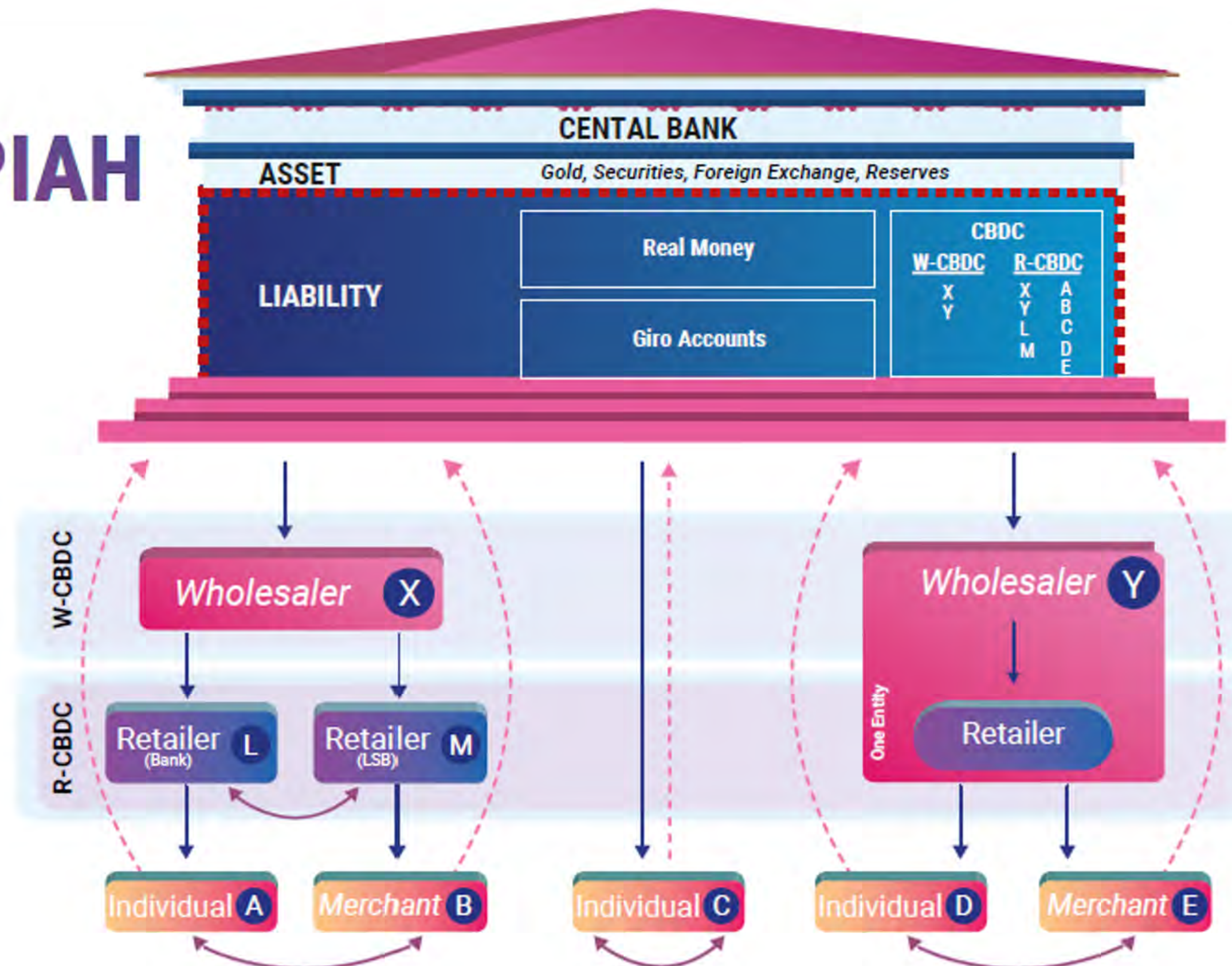


# CASE 1: INDONESIA

## DIGITAL RUPIAH DISTRIBUTION

### DIGITAL RUPIAH TIERING SYSTEM

Through wholesalers and retailers (open 1-tier)

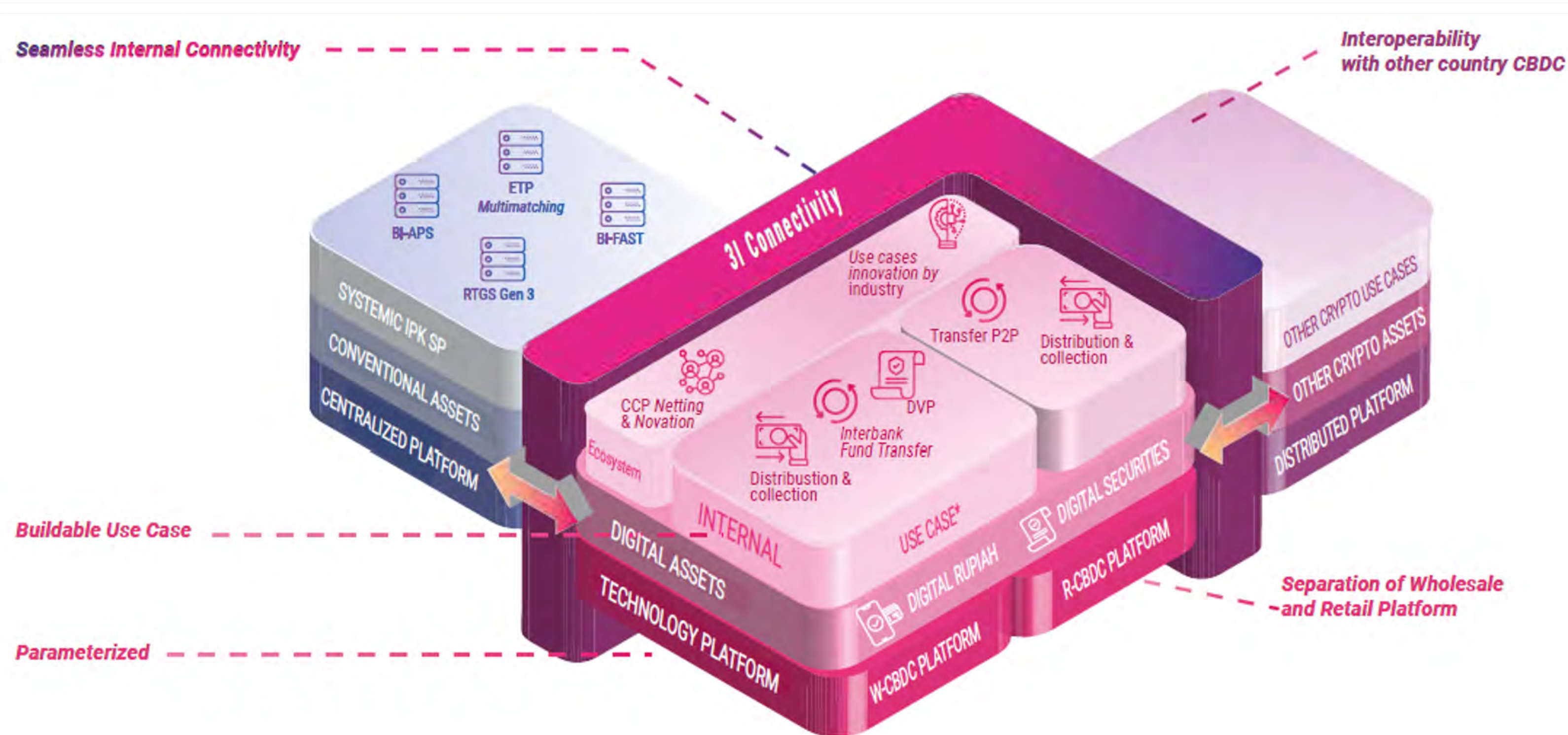


- ❖ Both wholesale and retail Digital Rupiah will be developed using an integrated end-to-end approach from wholesale to retail
- ❖ **Digital Rupiah** would be a complementary to banknotes, coins, and third-party reserves at BI
- ❖ **w-Digital Rupiah** would have limited accessibility to parties designated by BI
- ❖ **r-Digital Rupiah** could be used by general public just as banknotes and coins



# CASE 1: INDONESIA

## TECHNOLOGY ARCHITECTURE OF DIGITAL RUPIAH



### Basic components of Tech Platform



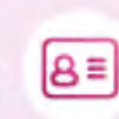
Sandbox



API



Smart Contract



Identity Service



Regulatory Service



Cryptography Secured

❖ The technology architecture of **Digital Rupiah** is divided into 3 layers: the technology platform, digital asset, and use cases based on the business process design:

1. **Technology platform layer.** This layer defines features that support **Digital Rupiah** as well as other types of existing and future BI's digital assets/liabilities.
2. **Digital asset layer.** This layer contains digital assets managed by BI and is built on top of the technology platform layer depending on use cases
3. **Use case layer.** It defines functions and services emerging from the use of digital asset layer. It contains use cases developed by BI and external parties.



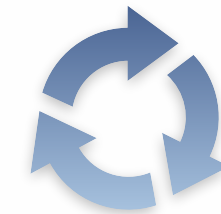
# CASE 1: INDONESIA

## LESSONS LEARNED



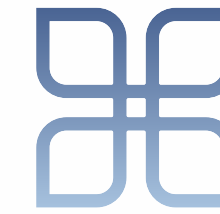
### Collaborative Approach

- ◆ Engaging with diverse stakeholders, both nationally and internationally, is pivotal for smooth adoption and addressing challenges.



### Phased Implementation

- ◆ Gradual rollouts allow for comprehensive testing and adjustments at each stage, thus minimizing risks.



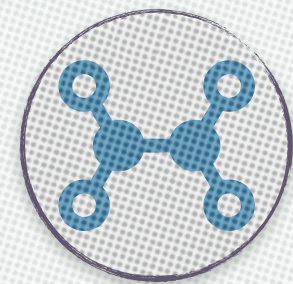
### Upholding Attributes

- ◆ Despite the digital transformation, maintaining such attributes as stability, safety, and efficiency by the Central Bank is paramount for public trust.



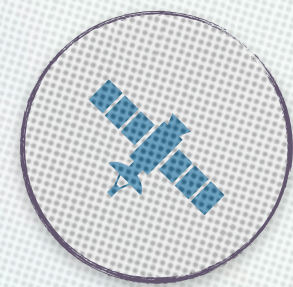
# CASE 1: INDONESIA

## COUNTRY-SPECIFIC POLICY RECOMMENDATIONS



### Holistic engagement

- ◆ Evolution of **Digital Rupiah** is a collaborative endeavor that spans beyond BI. This involves legal alignments that necessitate the participation of both government and parliament. Transparent communication tools such as consultative papers and focus group discussions are vital in this engagement.



### National priority areas

- ◆ **Project Garuda** has a sight set on multifaceted domains. From monetary systems, government transactions, and cyber resilience to integration with the Web 3.0 crypto ecosystem, each area is meticulously addressed.



### Interagency cohesion

- ◆ **Project Garuda's** objectives are met, necessitating seamless cooperation among financial bodies, relevant ministries, and industry stalwarts. Interagency forums are pivotal in enhancing these collaborations.



# CASE 1: INDONESIA



## POLICY RECOMMENDATIONS FOR OIC MEMBER COUNTRIES

### 1 International collaboration

- ◆ Collaborating with the international front is indispensable. OIC member countries can derive valuable lessons from Bank Indonesia's strategies, particularly their collaboration with international bodies such as the IMF, BIS, and World Bank, as they navigate their journeys towards CBDC implementation.

### 2 Cross-border integration

- ◆ Robusting blockchain infrastructure integrated across borders. Cross-border integration is pivotal because it underpins enhanced financial cooperation among OIC nations and serves as a bedrock for secure, transparent, and efficient transactions.

### 3 Regulatory architecture

- ◆ Crafting a regulatory architecture designed specifically for supervising cross-border transactions.
- ◆ OIC should contemplate that COMCEC, in partnership with BIS, can play a vital role in improving collaboration, sharing expertise, and facilitating CBDC implementation among OIC member countries.





# CASE 2: NIGERIA



# CASE 2: NIGERIA

## KEY FACTS

❖ **Population: 214 mln**

Source: World Population Prospects 2022

❖ **Mobile phone ownership:**  
❖ **80% of adults**

Source: Wezel & Ree, 2023

❖ **Internet penetration:**  
❖ **37% of population**

Source: Statista, 2022

❖ **Mobile internet users:**  
❖ **37.3% of population**

Source: Mirani & Quartz, 2022

❖ **Internet subscribers:**  
❖ **70% of population**

Source: Statista, 2022

❖ **66% of active lines are in dual SIM phone**

Source: GeoPol, 2021

- ❖ Leading Economy on the African Continent
- ❖ **eNaira: A Significant Learning Opportunity**
  - ❖ Launched on 25 / 10 / 2021
  - ❖ 2nd CBDC open to the public
- ❖ The **eNaira** presents a compelling case study for analyzing its implementation's key challenges and successes.





## CASE 2: NIGERIA

### KEY FACTS

◆ GDP growth rate: 3.1%

◆ Monetary policy rate: 18%

◆ Inflation: 17 year high at 21%

Source: Nigeria Bureau of Statistics

### MONETARY SYSTEM

- The Central Bank of Nigeria (CBN) has taken measures to mitigate the adverse effects of systemic shocks caused by high volatility in both global and domestic economic conditions
- Key objective of CBN's monetary policy: Maintaining internal and external balance of payments
- The objective is achieved through a variety of policies including monetary instruments



## CASE 2: NIGERIA

- ❖ Significant payment system reforms have been introduced in the country
- ❖ Designed to enhance the resilience of the technological infrastructure supporting electronic payment methods
- ❖ These reforms have significantly transformed the payment systems landscape and include:
  - The Real Time Gross Settlement System (RTGS),
  - Shared Agent Network Facility (SANEF),
  - Open Banking, Regulatory Sandbox, and
  - Bank Verification Number (BVN)
  - The national domestic card scheme aimed at expanding electronic payments nationwide to rival global payment cards such as Visa and Mastercard, integrating the economy's informal sector and promoting financial inclusion.



# CASE 2: NIGERIA

## BENEFITS TO FIN ECOSYSTEM



## eNaira and Financial Ecosystem

- ❖ A part of comprehensive set of reforms to enhance the payment system infrastructure and promote financial inclusion in Nigeria
- ❖ Expected to enhance the effectiveness of the CBN's monetary and fiscal policy and foster financial inclusion in the country.



## CASE 2: NIGERIA

### LEGAL AND REGULATORY FRAMEWORK

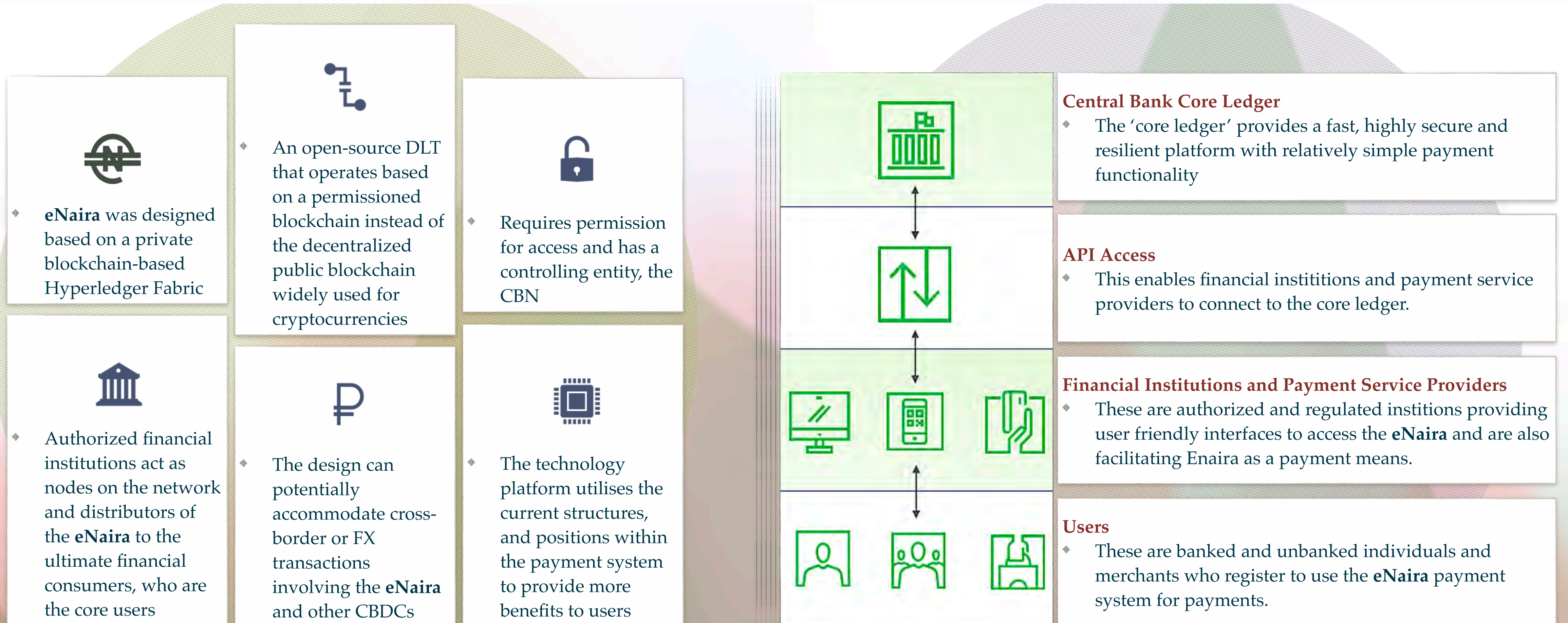
- ❖ The CBN Act and the Banks and Other Financial Institutions Act 2020 confer exclusive powers on the CBN to issue legal tender, ensure financial system stability and develop an electronic payments system.
- ❖ As a result, the **eNaira** is a digital legal tender backed by law, solely regulated by the CBN
- ❖ In legal terms, the **eNaira** is a direct liability of the CBN
- ❖ The Regulatory Guidelines on the **eNaira** issued by the CBN in October 2021 aim to simplify the operation of the **eNaira**, promote its adoption, engender financial inclusion, and promote low-cost transactions
- ❖ The guidelines apply to all financial institutions and consumers using the **eNaira**





# CASE 2: NIGERIA

## eNaira: Underlying Technology - Technical and Operational Standards



Source: Central Bank of Nigeria

Source: Central Bank of Nigeria



## CASE 2: NIGERIA

### ANTI-MONEY LAUNDERING AND COMBATTING FINANCIAL TERRORISM (AML/CFT)



- ❖ A key objective of the eNaira is to contribute to AML / CFT policies and promote transaction traceability
- ❖ CBN adopted the account-based CBDC for eNaira operations
- ❖ Users on the platform are identified using the traditional identity framework implemented by the CBN: the Bank Verification Number (BVN) and the National Identification Number (NIN)
- ❖ All financial institutions are required to conduct AML / CFT checks
- ❖ The CBN uses the layered platform model to ensure compliance with AML / CFT checks





## CASE 2: NIGERIA

### Rate of Adoption



#### Early Stage

- ◆ Successful launch followed by stagnated adoption rates
- ◆ 92% of wallets were inactive
- ◆ Average weekly transaction volume only N53,000 (~US\$120)



#### Cash Crunch

- ◆ Shortage of bank notes bolstered demand
- ◆ Out of 10 bln minted, 3.4 bln now in circulation
- ◆ Transactions increased by 63% to 22 bln **eNaira**



#### Prospects

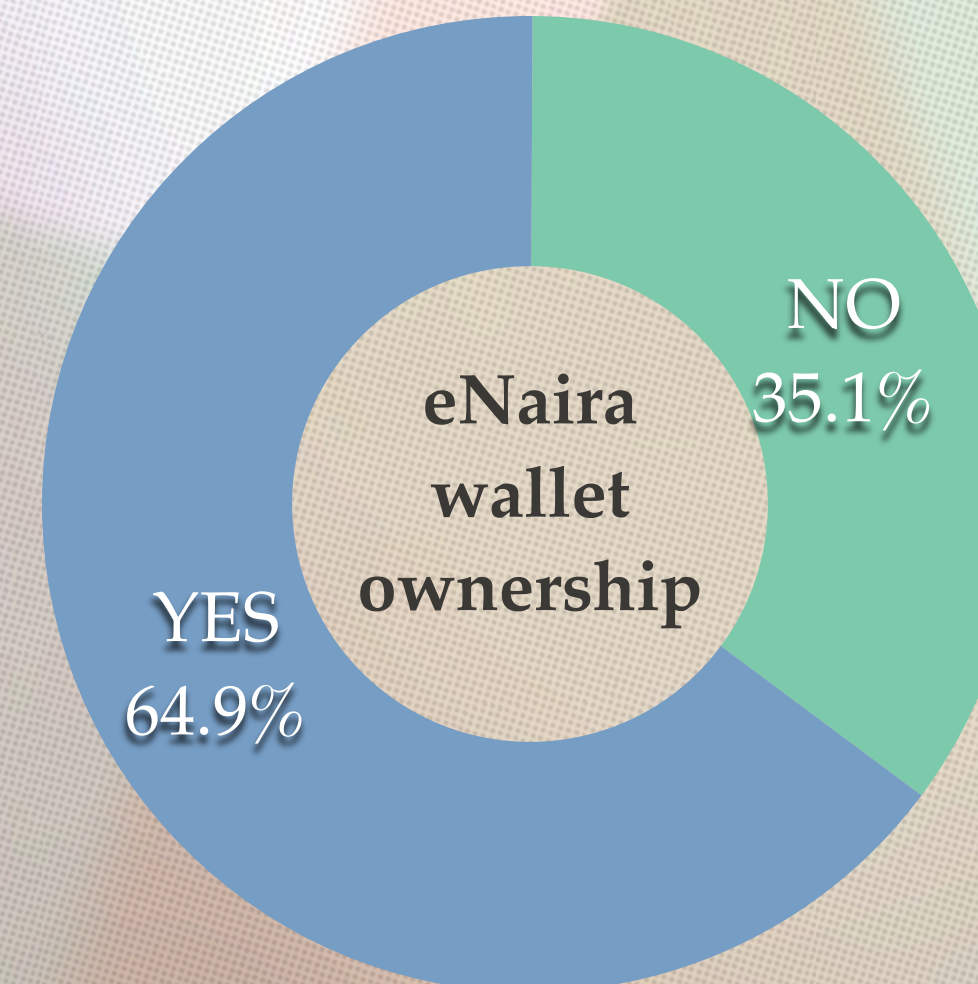
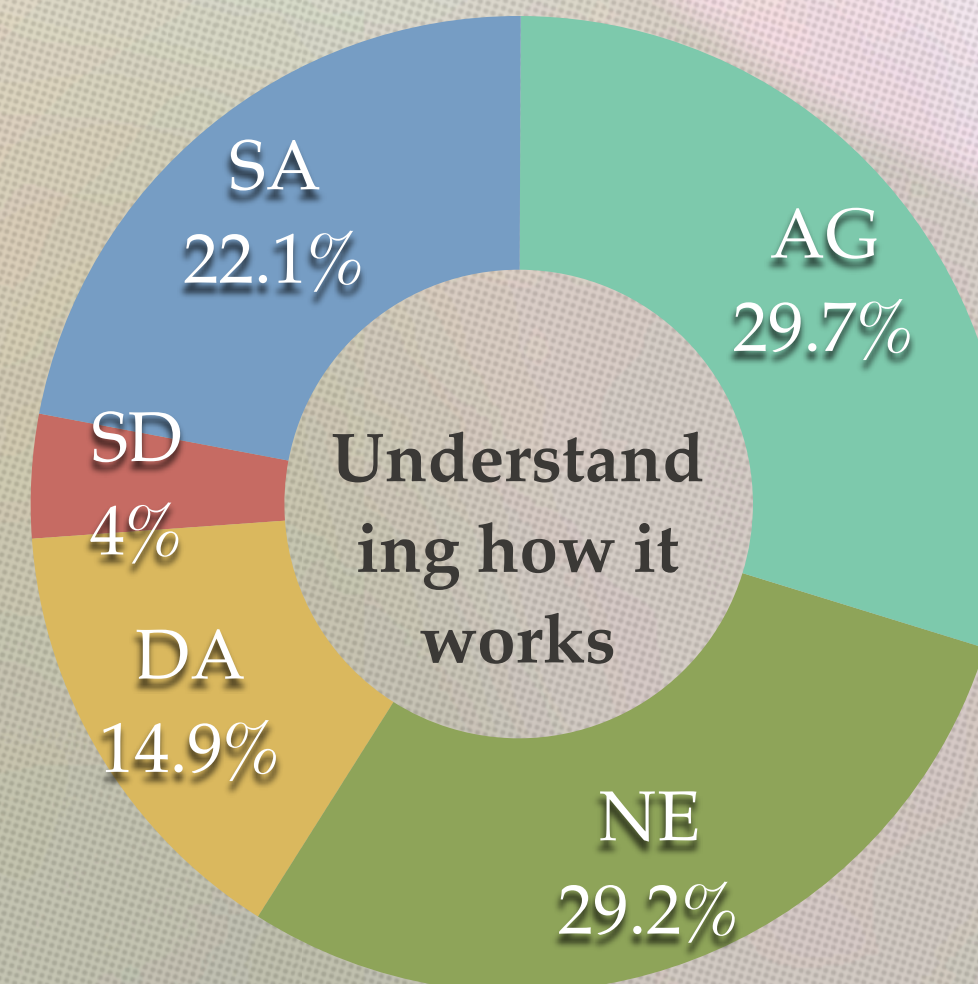
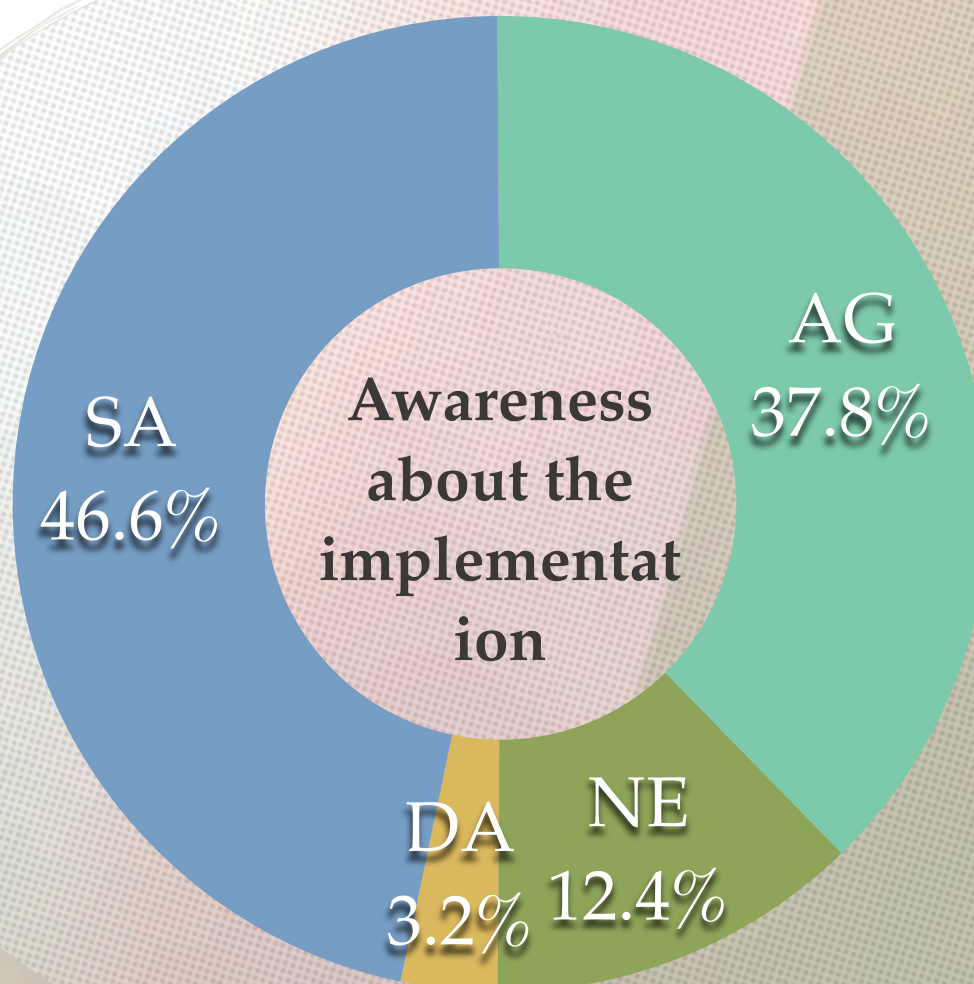
- ◆ Long way to go with wallet downloads at 5.9% of population
- ◆ Introduction of **USSD** to boost adoption amongst rural and unbanked populations
- ◆ Eliminating the need for a legacy bank account to lower entry barrier



# CASE 2: NIGERIA

## CHALLENGES

- ◆ The public survey corroborates earlier reports on the low adoption rate
- ◆ Perceptions about the **eNaira** and its subsequent adoption are significantly influenced by:
  - ◆ Lack of awareness and supportive policies
  - ◆ IT infrastructure limitations, especially in areas with limited internet and unstable energy access.



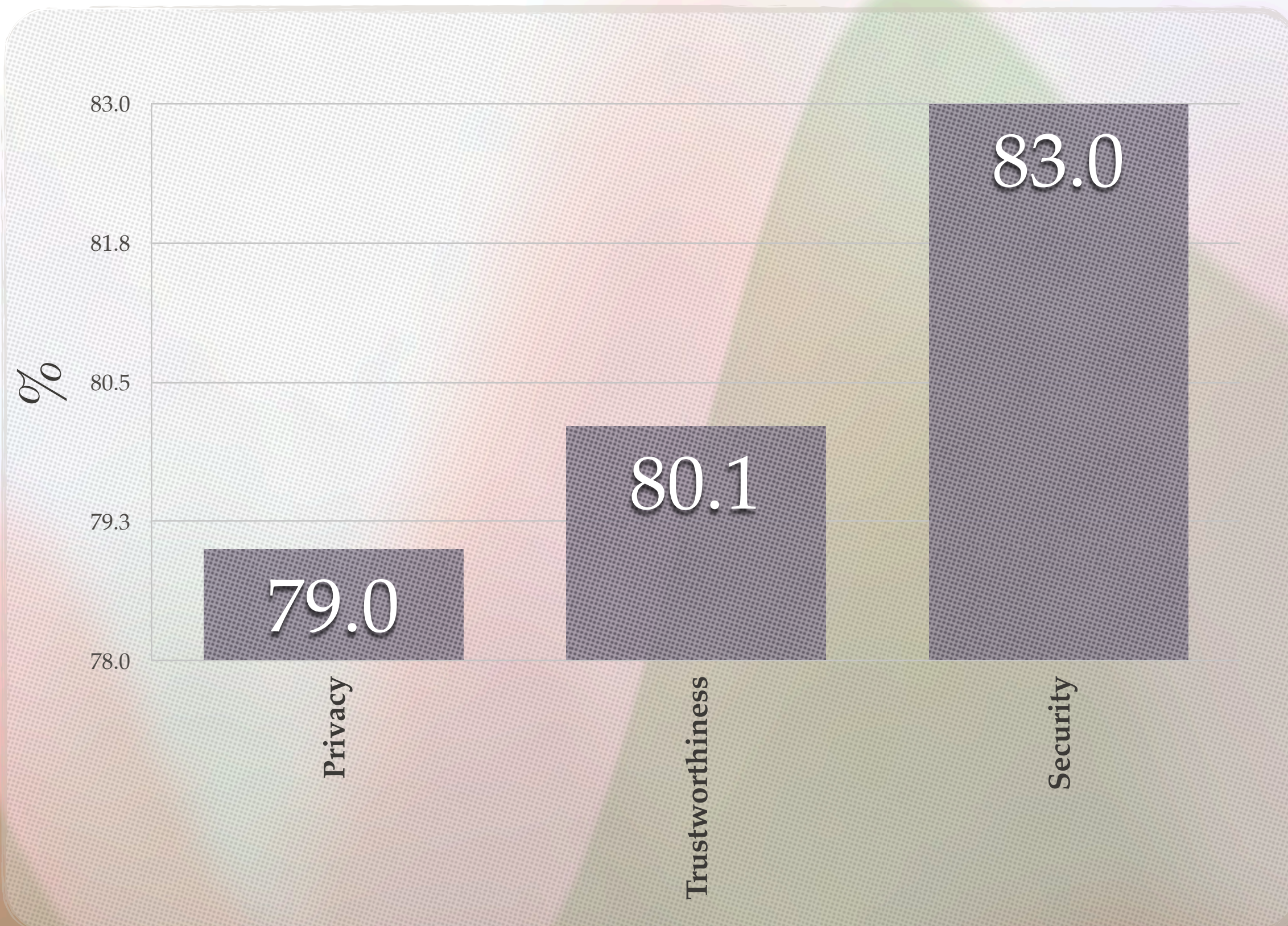
SA: Strongly Agree  
AG: Agree  
NE: Neutral  
DA: Disagree  
SD: Strongly Disagree



# CASE 2: NIGERIA

## CHALLENGES

- ◆ Concerns relating to security, reliability, and privacy were raised as critical considerations in adopting the CBDC:



- ◆ These concerns lead to a willingness to only use the CBDC for less significant transactions:





## CASE 2: NIGERIA

### TRENDS

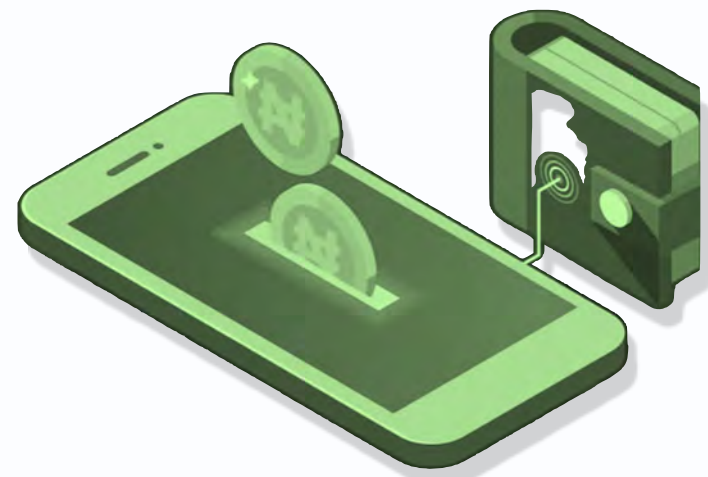
- ❖ Despite the challenges faced in the implementation of the **eNaira**, respondents are optimistic about its potential:
  - ❖ **62.5%** of respondents expressed a desire for the new government to continue the implementation of the **eNaira**.
  - ❖ **75%** are willing to engage with the **eNaira** provided that existing technical challenges are effectively resolved.
  - ❖ **70.7%** of respondents favour **eNaira** over unregulated digital currencies such as Ethereum or Bitcoin.
  - ❖ Over **50%** anticipate its use for cross-border payments.





## CASE 2: NIGERIA

### TRENDS



- ❖ The **eNaira** is expected to dynamically change the financial system and conventional financial service offerings, prompting traditional institutions to devise innovative strategies to remain relevant.
- ❖ With the layered payment system model adopted by the CBN, experts believe that banks cannot be excluded from the entire ecosystem since the central bank requires them to help distribute the **eNaira** and enable payment services for financial consumers.
- ❖ Experts and regulators anticipate financial inclusion as one of the most significant advantages of implementing the **eNaira**.



# CASE 2: NIGERIA

## LESSONS LEARNED

### Prerequisites for CBDC implementation:

- 1 A comprehensive evaluation of institutional frameworks, stakeholders, and the political, social, and economic landscape is a prerequisite for CBDC implementation.
- 2 New regulations and legal frameworks are required, which require ample time to develop and implement.
- 3 Financial literacy campaign to create awareness
- 4 A sound and resilient technology architecture

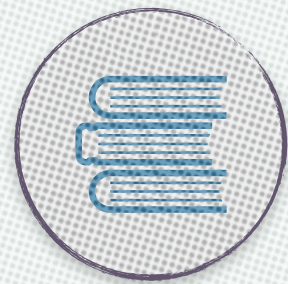
### Other lessons:

- 5 A large population may not necessarily result in the successful adoption of CBDC.
- 6 CBDCs should be designed to replicate the paper currency and not yield interest.
- 7 Unlike cryptocurrencies underpinned by fully decentralised ledger technology, CBDCs should be relatively stable in their values and not be subject to high market volatility.



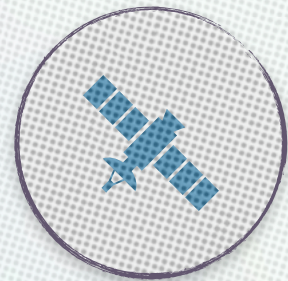
# CASE 2: NIGERIA

## COUNTRY-SPECIFIC POLICY RECOMMENDATIONS



### Financial Literacy and Education

- ◆ There is a need to embark on massive financial literacy programmes and ensure that people are well educated about the benefits of eNaira.



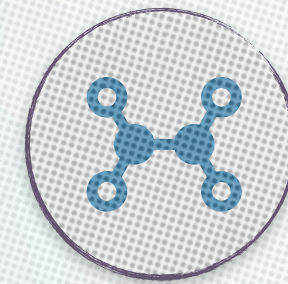
### Enhancing the resilience of the underlying technology

- ◆ There is a need to ensure that the underlying technology is resilient to cater to the large volume of transactions anticipated when more users are onboarded.



### Incentivising the usage of eNaira

- ◆ The government should consider introducing financial incentives such as pre-funding e-wallets for users who download the wallet during a certain period.



### Piloting the e-Naira

- ◆ CBN should treat the current implementation stage as a pilot to identify and resolve teething issues.

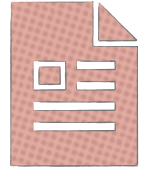


### Government levies should be paid through eNaira

- ◆ In the next phase of implementation, following the resolution of technological and operations issues, the government could channel all government levies and payments through the eNaira



# CASE 2: NIGERIA



## POLICY RECOMMENDATIONS FOR OIC MEMBER COUNTRIES

1

- ◆ Develop a template framework for implementing CBDCs in OIC member countries to foster trade and cross-border transactions.

2

- ◆ Consider establishing a cross-border regulatory framework to regulate cross-border transactions through a Convention or multilateral treaty framework among member countries.

3

- ◆ Provide a high-level adaptable legal framework in the form of model legislation for member countries' adoption or adaptation.

4

- ◆ The OIC Arbitration Centre could play a role in developing standardized dispute management protocols to address issues emanating from CBDC payments and transactions.

5

- ◆ Learn from the eNaira design to promote Shari'ah-compliant monetary and payment systems and ensure that the CBDCs within member countries are subject to the rules of Ribā and Gharar.





# CASE 3: PAKISTAN



## CASE 3: PAKISTAN

### KEY FACTS

◆ **Population: 238.1 mln**

◆ **Mobile phone ownership:**  
◆ **80.5% of adults**

◆ **Internet penetration:**  
◆ **55% of population**

◆ **Mobile internet users:**  
◆ **53.1% of population**

◆ **Internet subscribers:**  
◆ **54.5% of population**

- ❖ Major Economy in South Asia
- ❖ CBDC development is at the research stage
- ❖ An interesting case study with a well-established central banking mechanism and a large part of the youth population.



## CASE 3: PAKISTAN

### KEY FACTS

◆ **GDP growth rate (2023):  
0.29%**

◆ **Monetary policy rate: 22%**

◆ **Inflation: 31.4%**

### MONETARY SYSTEM

- The State Bank of Pakistan (SBP) is responsible for formulating and implementing monetary policies to control inflation, stabilize the exchange rate, and foster economic growth.
- The SBP regulates and supervises banks in Pakistan to ensure their stability and compliance with financial regulations.
- The SBP issues and manages the currency in Pakistan, overseeing the design, printing, distribution, and security of currency notes and coins.



## CASE 3: PAKISTAN

### PAYMENT SYSTEM

- ❖ The payment landscape in Pakistan continues to evolve, with an increasing shift toward digital payment methods and financial inclusion efforts aimed at providing access to financial services for all segments of the population.
- ❖ Large value real time fund transfers system known as PRISM (Pakistan Real-time Inter-bank Settlement Mechanism) and Real-Time Gross Settlement (RTGS)
- ❖ Real time retail payment system operated by 1Link
- ❖ Mobile payment solutions, including mobile wallets and banking apps
- ❖ Digital payment platforms like JazzCash and Easypaisa offer diverse financial services, including mobile wallets
- ❖ Launched domestic payment scheme known as PayPak for providing low-cost payment solution to consumers and financial institutions.
- ❖ SBP has developed Pakistan's first Instant payment system, called *Raast*, to offer instant, reliable and zero-cost digital payment services to the people of Pakistan with the objective of promoting the adoption of digital financial services in the country.



## CASE 3: PAKISTAN

### BENEFITS TO FIN ECOSYSTEM

Resilience of the payment ecosystem

Financial inclusion

Reducing transaction costs

Cross-border transactions efficiency

Increasing revenue and tax collection

Enabling direct welfare disbursements to citizens

- ❖ Modernization and reform of the payment system in Pakistan by introducing a CBDC
- ❖ To promote financial inclusion
- ❖ Enabling the SBP to exercise greater regulatory oversight and transparency in the financial system



## CASE 3: PAKISTAN

### LEGAL AND REGULATORY FRAMEWORK

- ❖ **1962:** The Banking Companies Ordinance governs the establishment and operation of banks in Pakistan.
- ❖ **2015:** The SBP introduced regulations for Electronic Money Institutions (EMIs), allowing non-banking entities to offer electronic money services.
- ❖ The roles and responsibilities of the SBP in payment systems are mainly governed by the Payment Systems & Electronic Fund Transfer Act 2007.
- ❖ The SBP has issued cybersecurity and data protection guidelines to safeguard the integrity and confidentiality of digital financial transactions and customer data.
- ❖ Regulations and standards related to the security of payment card transactions, including EMV (Europay, Mastercard, and Visa) standards, have been implemented to protect cardholders and promote secure digital payments.
- ❖ Introduced regulatory sandboxes that allow fintech startups to test innovative financial products and services under controlled conditions, enabling innovation while maintaining regulatory oversight.
- ❖ Established regulations for cross-border remittances.



## CASE 3: PAKISTAN

- ❖ The SBP is exploring the possibility of issuing a CBDC in Pakistan. The SBP has set up a working group to study the feasibility of CBDC and to develop a roadmap for its implementation.
- ❖ Digital Innovation and Settlements Department (DI&SD) was created in SBP on June 25, 2021, as a result of restructuring within SBP under which a Digital Financial Services Group (DFSG) was created comprising of the following two departments:
  - A. Digital Innovation & Settlements Department
  - B. Payment Systems Policy & Oversight Department
- ❖ Considering SBP's vision for digitization of banking and payments in Pakistan, the DI&SD strives for undertaking innovative projects in the sphere of digital financial services and innovations including but not limited to: Open Banking, CBDC, Distributed Ledger Technology (DLT) and other evolving technological advancements.
- ❖ The SBP has announced to issuance of CBDC in 2025 in Pakistan. SBP officials claim to start a feasibility study to explore the possibility and of developing a CBDC that is safe, secure, and beneficial for the Pakistani economy.



## CASE 3: PAKISTAN

### Crypto Adoption Trends

Pakistan exhibits notable standings across various categories:

- ❖ **Overall Index Ranking:** # **6** in the global ranking, indicating a substantial adoption of cryptocurrencies within the country.
- ❖ **Centralized Service Value Reception:** # **10**, signifying a significant utilization of cryptocurrencies on centralized platforms.
- ❖ **Retail Centralized Service Value Reception:** # **10**, indicating a strong presence of cryptocurrency use in regular commercial transactions.
- ❖ **P2P Exchange Trade Volume:** # **50**, implying a moderate involvement in direct peer-to-peer cryptocurrency trading.
- ❖ **DeFi Value Reception:** # **22**, suggesting a growing engagement with decentralized financial protocols.
- ❖ **Retail DeFi Value Reception:** # **16**, indicating a noteworthy adoption of DeFi services among everyday users.





## CASE 3: PAKISTAN

### ISSUES AND TRENDS

#### Issues:

- ❖ **Technical challenges.** The development of a CBDC requires a high level of technical expertise and resources. The SBP is working to build up its technical capacity in this area.
- ❖ **Legal and regulatory challenges.** The issuance of CBDC would require new laws and regulations. The SBP is working with the government to develop these laws and regulations.
- ❖ **Public acceptance.** The success of CBDC will depend on public acceptance. The SBP is working to educate the public about CBDC and to build trust in this new technology.
- ❖ **Financial stability risks.** The issuance of CBDC could pose risks to financial stability. The SBP is working to mitigate these risks.

#### Trends:

- ❖ **Increasing interest from the SBP:** The SBP is increasingly interested in the potential benefits of CBDC.
- ❖ **Growing international cooperation:** The SBP is working with other central banks and international organizations to share knowledge and experience on CBDC.
- ❖ **Technological advancement:** The development of new technologies, such as blockchain, is making CBDC more feasible.



## CASE 3: PAKISTAN

### COUNTRY-SPECIFIC POLICY RECOMMENDATIONS

- 1 Digital Infrastructure Investment**  
Prioritize investments in digital infrastructure, including widespread internet access and mobile connectivity, to ensure that a CBDC can be accessed and used by a significant portion of the population.
- 2 Robust Regulatory Framework**  
Develop a comprehensive regulatory framework that addresses issues related to CBDC issuance, circulation, and usage.
- 3 Financial Literacy Programs**  
Launch financial literacy and awareness campaigns to educate the public about the benefits and responsible use of CBDCs.
- 4 Collaboration with Financial Institutions**  
Work closely with commercial banks and other financial institutions to ensure a smooth integration of CBDC into the existing financial ecosystem.
- 5 Research and Pilot Programs**  
Continue with thorough research and development stages, including pilot programs, to test the CBDC's feasibility, scalability, and usability in Pakistan's unique economic environment.



# CASE 3: PAKISTAN



## POLICY RECOMMENDATIONS FOR OIC MEMBER COUNTRIES

### Collaborative Learning Networks

- ◆ Establish collaborative learning networks within the OIC to share knowledge and expertise related to CBDC implementation.

1

### Digital Infrastructure Development

- ◆ Prioritize investment in digital infrastructure across OIC countries, especially in regions with limited access to technology.

2

### Flexible Regulatory Frameworks

- ◆ Encourage countries to establish baseline regulatory requirements while providing flexibility for further refinement as their CBDC projects progress.

3

### Inclusive Financial Education

- ◆ Implement comprehensive financial education programs that target underserved populations, focusing on digital literacy and CBDC awareness.

4

### Collaborative Research Initiatives

- ◆ Foster collaborative research initiatives among OIC countries to explore innovative use cases and potential benefits of CBDCs in regional contexts.

5



# CASE 4: QATAR



# CASE 4: QATAR

## KEY FACTS

◆ **Population: 2.71 mln**

◆ **Mobile phone ownership:**  
◆ **180.9%**

◆ **Internet penetration:**  
◆ **99% of population**

◆ **Internet subscribers:**  
◆ **96.8% of population**

◆ **Median Mobile Internet connection speed via cellular networks:**  
◆ **176.18 MBps**

## Background

- ◆ Ranking 5th in the top countries by Islamic finance assets
- ◆ #8 in the top countries by Takaful Assets
- ◆ #4 in emerging market indicator
- ◆ #2 in emerging markets optimism indicator



## CASE 4: QATAR

### KEY FACTS

◆ **GDP growth rate:**  
◆ 2.4%

◆ **Monetary policy rate:**  
◆ 6.25%

◆ **Inflation: 3%**

- ❖ It is inconceivable to think of a financial system without a legal system to support it
  - Legal system: civil law that is primarily influenced by Islamic law (Shari'ah)
  - Independent judiciary with specialized courts to handle specific legal matters
  - Qatar updated its legal system in order to attract FDI while safeguarding its cultural and religious heritage
  - Monetary and payment systems are operated by Qatar Central Bank (QCB)
  - QCB is responsible for issuing the Qatari Riyal (QAR)



## CASE 4: QATAR

- ❖ **Qatar Payment System (QPS):** Real time gross settlement system to settle interbank payments in real time. Used by all Qatari banks to transfer and receive payments.
- ❖ **Qatar Mobile Payment (QMP):** Instant mobile payment system that allows users to make payments and transfer funds using their smartphones. Operated by Qatar Central Bank and licensed payment service providers (10 banks + 2 telecom companies).
- ❖ **3rd Party Payment Services:** Allowing users to make payments for goods and services online, over the phone and in person (i.e. SADAD – FATORA)



## CASE 4: QATAR

### CBDC Status

- ❖ Qatar is still in the early stages of developing CBDC
- ❖ Expert interviews: executives, directors, managers, and division heads from a diverse array of financial institutions
- ❖ The interview questions: the CBDC's possible future introduction to the corresponding elements of SWOT. CBDC's impact on cross-border transactions, the impact on the financial sector and international collaboration, and the requirement for a regulatory framework





# CASE 4: QATAR

## LESSONS LEARNED

### Strengths

- ◆ Lower transaction cost and accessibility
- ◆ Immediate settlement finality
- ◆ Effective monetary policy
- ◆ Bringing clarity to the market
- ◆ The key features: “the Central Bank behind it” and traceability

### Weaknesses

- ◆ High cost of infrastructure required for CBDC implementation
- ◆ Readiness of Qatar’s market and learning curve
- ◆ Cybersecurity sensitivity
- ◆ Emerging technology risks
- ◆ Required operational resilience
- ◆ System to handle a large number of users
- ◆ Energy consumption



# CASE 4: QATAR

## LESSONS LEARNED

### Opportunities

- ◆ Transactions improvement
- ◆ Creation of a faster payment environment for individual and banking sector
- ◆ Improvement of monetary policy due to real-time data
- ◆ Participation of the unbanked in the economy leading to economic growth
- ◆ Effective opportunity for new AML / CFT standards

### Threats

- ◆ Privacy concern
- ◆ Cybersecurity threats
- ◆ Emerging technology risks



## Considerations

### Cross-Border Transactions

- ◆ Reduces time and cost
- ◆ GCC may have an opportunity for currency conversion projects
- ◆ A possible challenge is the different legal frameworks in each jurisdiction
- ◆ Different governance requirements by central banks

### Impact on Financial Sector

- ◆ Possible negative impact on the banking sector
- ◆ Forcing banks to innovate alternate sources of funding
- ◆ Impact on the banking sector may be minimal if CBDC was wholesale

### International Cooperation

- ◆ A standard CBDC model will harmonize the interoperability of CBDC
- ◆ Regional blocks, international organizations, and oil-producing countries may have separate collaborations for CBDC
- ◆ International cooperation would be practical on CBDC standards that incorporate AML / CFT, and fraud-prevention agreed standards

### Regulatory Framework

- ◆ Requirement for a clear regulatory framework to ease technology usage
- ◆ The need to involve all different regulators within each jurisdiction (i.e., banking, securities, insurance, privacy... etc.)
- ◆ Link between digital identification and actual governmental-issued identification
- ◆ Concern for privacy must be translated into transparent regulations



# CASE 4: QATAR

## COUNTRY-SPECIFIC POLICY RECOMMENDATIONS



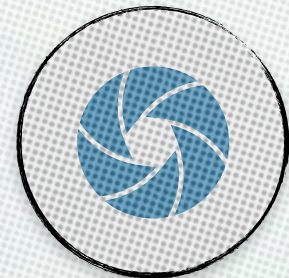
### Regulatory Review

- ◆ Regulatory review before launching the CBDC



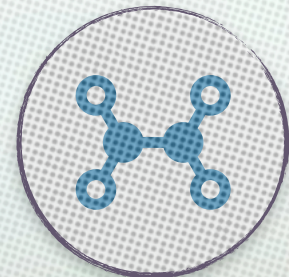
### Priority

- ◆ Start with CBDC wholesale first



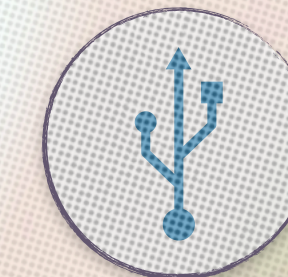
### Implementation

- ◆ Gradual CBDC introduction



### Privacy

- ◆ Privacy consideration design



### Cybersecurity

- ◆ Design CBDC considering cybersecurity threats coming from emerging technologies such as artificial intelligence and quantum computing



# CASE 4: QATAR



## POLICY RECOMMENDATIONS FOR OIC MEMBER COUNTRIES

1

### Harmonization / standardization

- ◆ To mitigate cross-border transaction delays and enhance interoperability

2

### Sustainable CBDC design

- ◆ To have a sustainable solution, the design should aim to reduce carbon emissions and energy consumption by utilizing green technology and lowering environmental footprint

3

### Sharing experiences on CBDC cybersecurity threats by members

- ◆ To eliminate possible similar threats to another country

4

### OIC currency conversion project

- ◆ To allow the exchange of one country's CBDC with another using a real-time digital exchange rate platform

5

### OIC CBDC forum

- ◆ To create a specialized platform for sharing knowledge and lessons learned on CBDC design and development



# CASE 5: SINGAPORE



# CASE 5: SINGAPORE

## KEY FACTS

◆ Population: 5.5 mln

◆ Mobile phone ownership:  
◆ 153.8%

◆ Internet penetration:  
◆ 96.9% of population

◆ Mobile internet users:  
◆ 85.7% of population

◆ Internet subscribers:  
◆ 96% of population

◆ Active lines in dual SIM:  
◆ 59%

- ❖ Major Economy is South East Asia Pacific Region
- ❖ As a leading financial center in Asia, Singapore embarked on its journey of CBDCs in 2016 with a project named "Ubin" and for w-CBDC in 2016 and for r-CBDC in 2021.
- ❖ An in-depth examination of Singapore's journey promises to provide valuable insights and best practices for other countries.



## KEY FACTS

◆ **GDP growth rate (2023): 1.5%**

◆ **Monetary policy rate: 3.6%**

◆ **Inflation: 5.5%**

### ❖ **Monetary System:**

- The Monetary Authority Singapore (MAS) serves as the CB and regulatory authority responsible for overseeing and governing the financial sector.
- MAS regulates and supervises banks in the country to ensure their stability and compliance with financial regulations.
- MAS issues and manages the currency in the country, overseeing the design, printing, distribution, and security of currency notes and coins.





## CASE 5: SINGAPORE

- ❖ Singapore's electronic payment systems are renowned for their efficiency, enabling seamless fund transfers and transactions.
- ❖ Notable systems include:
  - FAST (Fast and Secure Transfers), PayNow, and SGQR, a national QR code standard simplifying payments.
  - Payment cards, including credit and debit cards from major networks like Visa and MasterCard, are widely accepted.
  - Mobile payment solutions like Apple Pay, Google Pay, and Samsung Pay are also commonplace.
- ❖ Singapore has also established itself as a cryptocurrency-friendly jurisdiction.



## BENEFITS TO FIN ECOSYSTEM

Resilience of the payment ecosystem

Financial inclusion

Reducing transaction costs

Cross-border transactions efficiency

Increasing revenue and tax collection

Enabling direct welfare disbursements to citizens

## Ubin and Financial Ecosystem

- ❖ MAS has predominantly directed its experimental efforts towards wholesale cross-border transactions involving financial institutions.
- ❖ On the front of r-CBDC, MAS has conducted a comprehensive initial appraisal of the economic rationale underpinning its potential issuance in Singapore.
- ❖ This preliminary assessment encompasses a deep-seated examination of its implications for financial stability and the tenets of monetary policy.
- ❖ MAS is quick to acknowledge the prospect of future scenarios wherein a r-CBDC might produce benefits, ranging from augmenting financial inclusion and empowering programmable money to mitigating systemic vulnerabilities.



# CASE 5: SINGAPORE

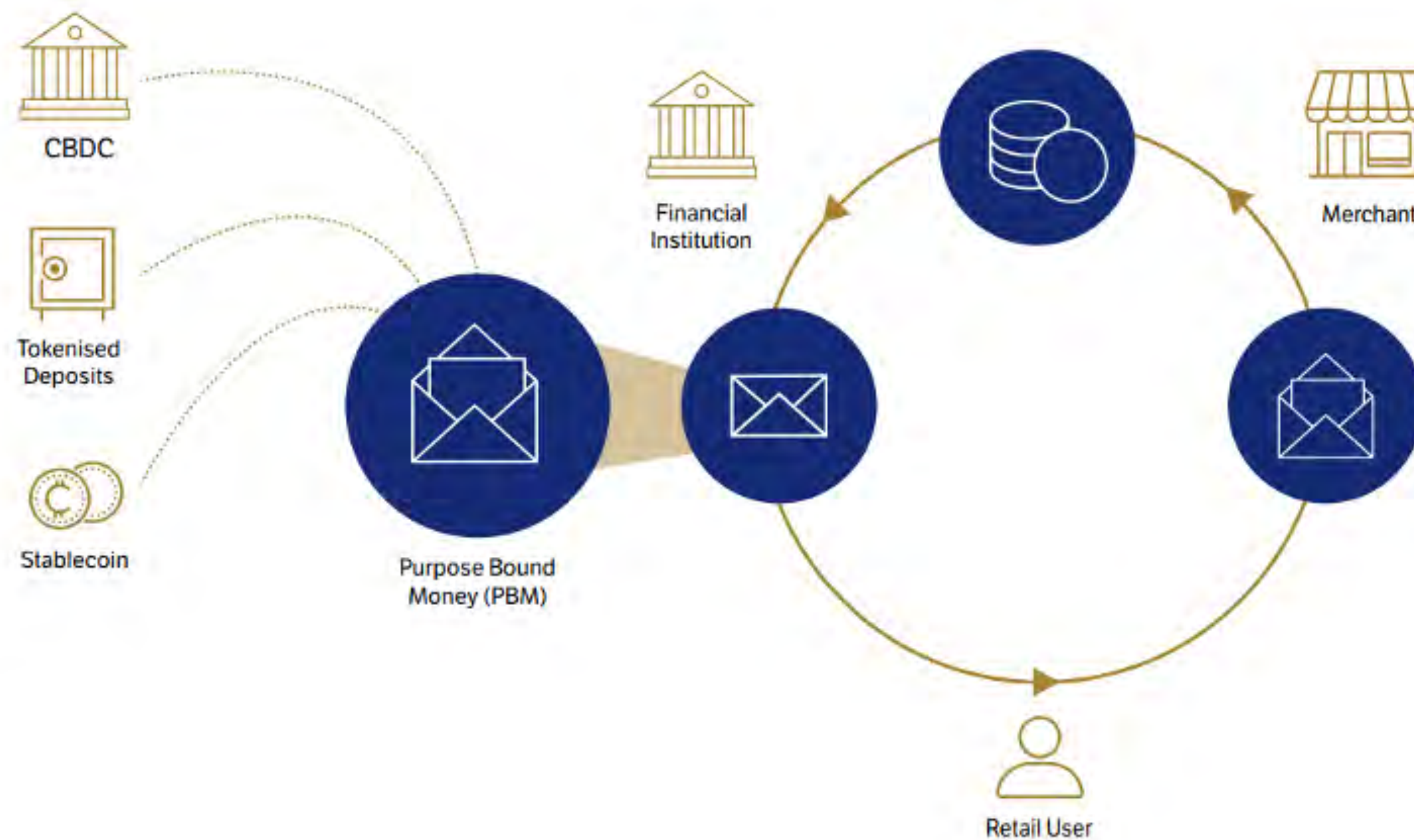
## LEGAL AND REGULATORY FRAMEWORK

- ❖ **Prior to 1970:** Various monetary functions associated with a CB were performed by several government departments and agencies.
- ❖ **1970:** Parliament passed the Monetary Authority of Singapore Act leading to the formation of MAS on 1 January 1971. The passing of the MAS Act gave MAS the authority to regulate the financial services sector in Singapore.
- ❖ **1977:** Government decided to bring the regulation of the insurance industry under MAS.
- ❖ **1984:** The regulatory functions under the Securities Industry Act (1973) were also transferred to MAS. MAS now administers the various statutes pertaining to money, banking, insurance, securities and the financial sector.
- ❖ **2002:** Following its merger with the Board of Commissioners of Currency on 1 October 2002, MAS also assumed the function of currency issuance.
- ❖ **2020:** The Payment Services Act regulates cryptocurrency service providers and aims to provide a framework for licensing and supervision.
- ❖ **2023:** MAS expressed its commitment to overseeing stablecoin-related operations through the implementation of a novel framework known as 'the single-currency stablecoin (SCS) framework'.



# CASE 5: SINGAPORE

## DIGITAL CURRENCIES BACKING PBM



## r-CBDC: A Journey Towards Digital SGD

- ❖ After the initial assessment, MAS embarked its journey towards digital SGD by launching a project called “Orchid” at the Singapore Fintech Festival (SFF) 2021.
- ❖ The Purpose Bound Money (PBM) model, which is being investigated in the initial stage of Project Orchid, is to enhance the existing concept and functionalities of programmable payment and programmable money.
- ❖ It denotes a set of guidelines and specifications that outline the criteria under which a digital currency can be utilized.



# CASE 5: SINGAPORE

## SYSTEM ARCHITECTURE OVERVIEW

The network components can be classified into 4 distinct layers: **access layer, service layer, asset layer, and platform layer.**



## PBM Technological Infrastructure

- ❖ The PBM solution has been specifically developed to be compatible with both DLT and non-DLT based ledger infrastructure.
- ❖ The initial phase of Project Orchid involved conducting experiments to investigate the interoperability of Permissioned Blockchain Model across various types of ledgers.
- ❖ These ledgers included both public and permissioned, as well as centralized and decentralized systems.
- ❖ The PBM protocol utilizes a 4-layered paradigm to delineate the technological framework employed in a digital asset-centric network.



## Adoption | Use Cases of r-CBDC

- ◆ At the initial stage, the concept has been subjected to several testing by MAS, in collaboration with government agencies and industry stakeholders.
- 1. **Government Vouchers.** During the 2022 Singapore FinTech Festival (SFF 2022), DBS Bank Ltd (DBS) and GovTech's Open Government Products Division conducted a trial to assess the feasibility of utilizing PBM technology for the purpose of disbursing funds to a specific group of individuals. Participants in the trial have the ability to utilize RedeemSG coupons at designated food and beverage establishments. Upon redemption of these certificates, the merchants will directly receive the digital SGD equivalent associated with the vouchers.
- 2. **Commercial Vouchers.** Temasek, Fazz Financial Group Pte. Ltd (FAZZ) and Grab Holdings Ltd (Grab) tested the issuance of PBM as commercial digital vouchers at SFF 2022 participants on 2nd to 4th November 2022. Trial participants can utilise these vouchers through their preferred wallet applications to make purchases at

- 3. **Government Payouts.** The utilization of PBM for the delivery of payments from government agencies, specifically by OCBC Ltd (OCBC) and the Central Provident Fund Board (CPF Board), is set to be examined. This method aims to facilitate the distribution of government payouts to individuals, eliminating the need for recipients to own a bank account. The experiment will be carried out utilizing a test distribution scheme within a controlled setting, including a specific group of volunteers.
- 4. **Managing Learning Accounts.** United Overseas Bank Ltd (UOB) and SkillsFuture Singapore (SSG) have initiated a trial to assess the effectiveness PBM in augmenting the existing SSG Credit disbursement process. This initiative aims to facilitate the automatic release of SkillsFuture grants to training providers that meet the eligibility criteria.



# CASE 5: SINGAPORE

## SUMMARY OF W-CBDC PROJECTS

Project	Announcement/ Completion Date	Objective	Connected countries/ organizations
Ubin	2016	To explore the use of Blockchain and DLT for clearing and settlement of payments and securities	Monetary Authority of Singapore (MAS) in collaboration with J.P. Morgan and Temasek
Dunbar	09/2021	To explore the use of CBDCs for international settlements	Bank for International Settlements (BIS) Innovation Hub Singapore Centre, the Reserve Bank of Australia (RBA), the Bank Negara Malaysia (BNM), MAS and the South African Reserve Bank (SARB)
Mariana	11/2022	Improving the effectiveness, safety and transparency of FX trading and settlement	Banque de France, MAS and the Swiss National Bank in partnership with the Eurosystem BIS Innovation Hub
Onyx	06/2021	To explore the use of CBDCs for cross-border payments	Banque de France and MAS
Cedar x Ubin+	11/2021	To explore the use of DLT for cross-border multi-currency transactions	Federal Reserve Bank of New York's New York Innovation Center (NYIC) and MAS



## CASE 5: SINGAPORE

### TRENDS

- ❖ CBDC offers the MAS additional monetary policy tools. Real-time transaction data can provide insights into economic activity, helping in making more informed policy decisions.
- ❖ DeFi (Decentralized Finance) integration with CBDC is a notable trend. Singapore could explore DeFi applications built on the CBDC infrastructure.
- ❖ Integrating digital identity with CBDC is becoming common. Singapore might adopt digital identity solutions to enhance security and user verification.
- ❖ Sustainability is a growing trend. Singapore may explore green CBDC solutions that are more energy-efficient and align with global environmental goals.





# CASE 5: SINGAPORE

## LESSONS LEARNED

- 1 Contextualization is Key:** Rather than simply emulating models from other countries, nations should conduct a thorough assessment of their own strengths, weaknesses, and economic context. Singapore's decision to create a purpose-bound CBDC aligned with its specific requirements and financial ecosystem.
- 2 Leverage Existing Infrastructure:** Singapore wisely leveraged its advanced financial infrastructure to build a CBDC that seamlessly integrates with its existing systems.
- 3 Flexibility for Innovation:** Singapore's approach allows for flexibility in the use of the digital SGD for various purposes, such as business transactions or cross-border trade.
- 4 Avoid One-Size-Fits-All Approach:** Singapore's choice to develop a purpose-bound CBDC model underscores the importance of tailoring the digital currency's features and capabilities to align with a nation's economic goals and financial ecosystem.
- 5 Iterative Development:** The development of purpose-bound CBDCs should be an iterative process that allows for adjustments based on feedback and changing economic conditions.



# CASE 5: SINGAPORE

## COUNTRY-SPECIFIC POLICY RECOMMENDATIONS

- 1 Continue to promote fintech innovation.** Singapore has a strong track record of promoting fintech innovation, and this should continue to be a priority as the country explores the potential of CBDCs.
- 2 Develop a clear regulatory framework for CBDCs.** It is important to develop a clear regulatory framework for CBDCs before they are launched. This will help to ensure that CBDCs are used in a safe and responsible manner, and it will also help to protect consumers.
- 3 Partnerships and agreements with neighboring countries.** To maximize the benefits of a CBDC, Singapore should actively seek cross-border partnerships and agreements with neighboring countries and major trading partners.
- 4 Digital Identity Ecosystem Integration.** Seamlessly integrate CBDC with a comprehensive digital identity ecosystem. This integration can enhance security, reduce fraud, and enable efficient customer onboarding and authentication, improving the overall user experience.
- 5 Carbon-Neutral CBDC.** Explore the development of a carbon-neutral CBDC to align with global sustainability goals. Implementing blockchain technologies with lower energy consumption and promoting green practices in CBDC operations can contribute to Singapore's commitment to environmental responsibility.



# CASE 5: SINGAPORE



## POLICY RECOMMENDATIONS FOR OIC MEMBER COUNTRIES

### Investing in Digital Infrastructure

- ◆ Prioritize investments in digital infrastructure, including high-speed internet access and reliable mobile networks, to ensure that citizens have the necessary digital tools to access and use CBDCs.

1

### Fintech Ecosystem Development

- ◆ Encourage the growth of fintech ecosystems by supporting startups, innovation hubs, and accelerators. This can help build local expertise in digital technologies, including blockchain and DLT, which underpin CBDCs.

2

### Enhancing Cybersecurity Measures

- ◆ Prioritize investments in cybersecurity to safeguard CBDC systems against cyber threats and ensure the trust and security of digital currencies.

3

### Cross-Border Collaboration

- ◆ Collaborating with neighboring OIC member countries and international partners can facilitate cross-border payments and trade.

4

### Supporting Digital Literacy

- ◆ Implement educational initiatives to raise digital literacy levels among their populations, ensuring that citizens understand the benefits and risks associated with digital currencies.

5

### Monetary Policy Considerations

- ◆ Consider carefully the implications of CBDCs on their monetary policies, exchange rate regimes, and financial stability, taking into account lessons learned from Singapore's experience.

6

# SURVEY RESULTS

# SURVEY RESULTS

## DEMOGRAPHICS

**Participants: 89** (regulators, industry, academia)

**Countries: 19** (Belgium, Ecuador, Germany, Iraq, Indonesia, India, Malaysia, Morocco, Nigeria, Pakistan, Palestine, Qatar, Saudi Arabia, Thailand, Turkiye, UAE, Uruguay, UK, USA).

## SCOPE

**A:** CBDC's Potential Strengths (7 points)

**B:** CBDC's Potential Weaknesses (5 points)

**C:** CBDC's Potential Opportunities (4 points)

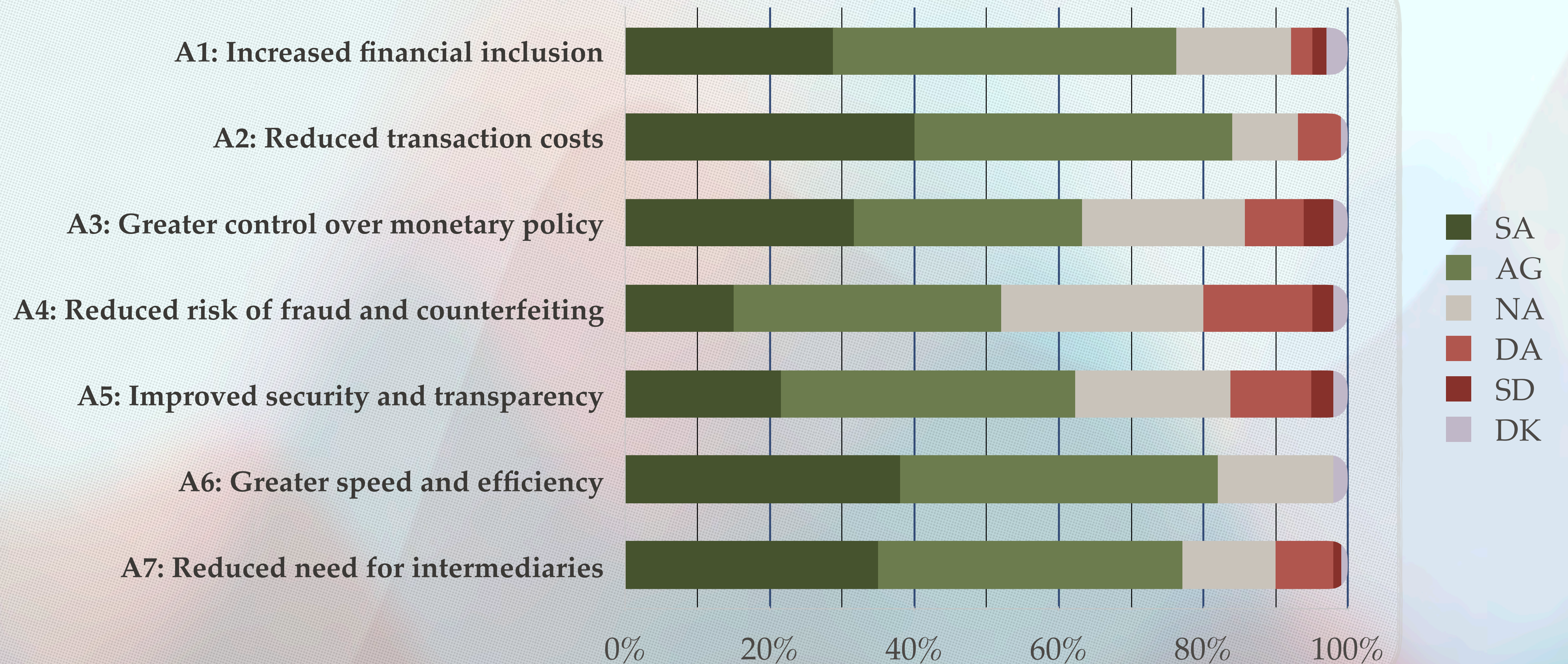
**D:** CBDC's Potential Threats (5 points)

**E:** CBDCs can potentially affect the banking industry (5 points)

**F:** Developing and implementing CBDCs in OIC countries require international collaboration and coordination in certain areas (6 points)

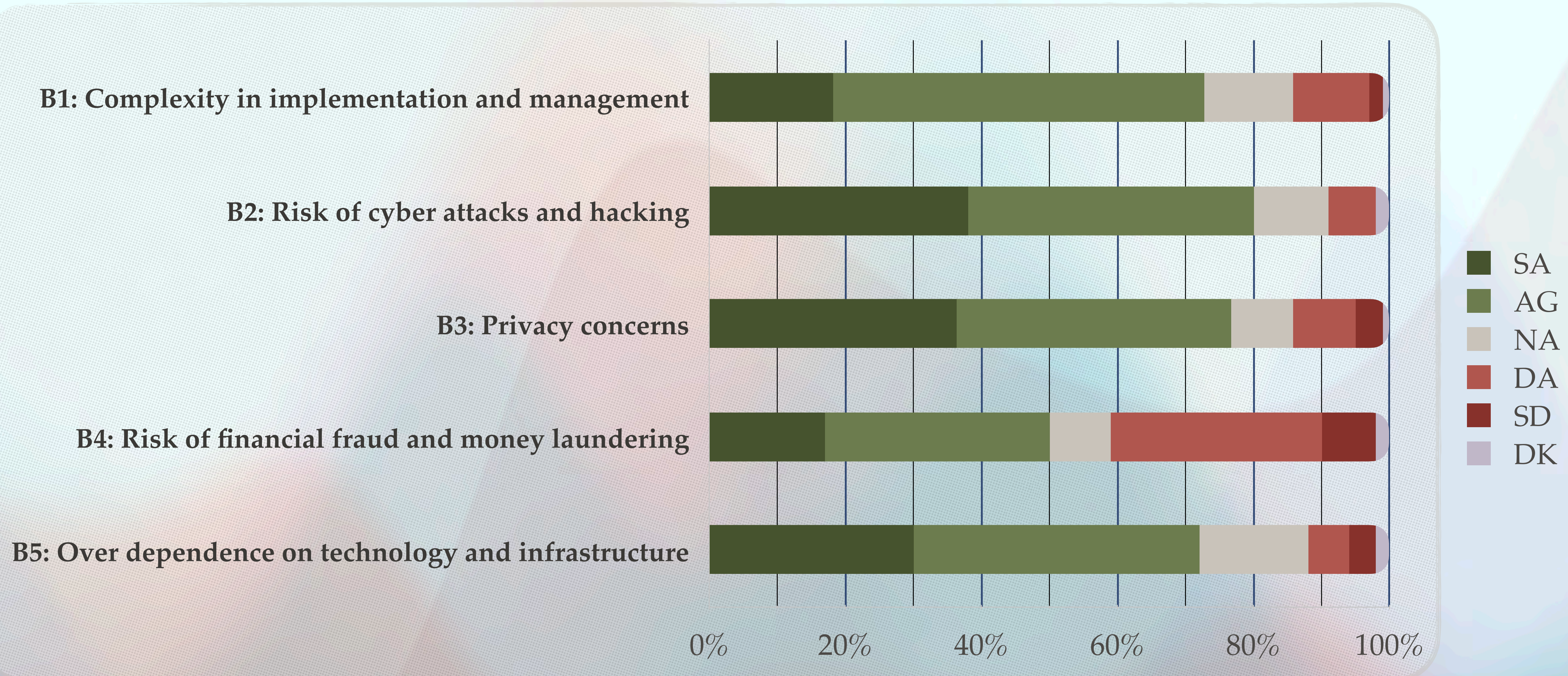
# SURVEY RESULTS

## A: CBDC'S POTENTIAL STRENGTHS



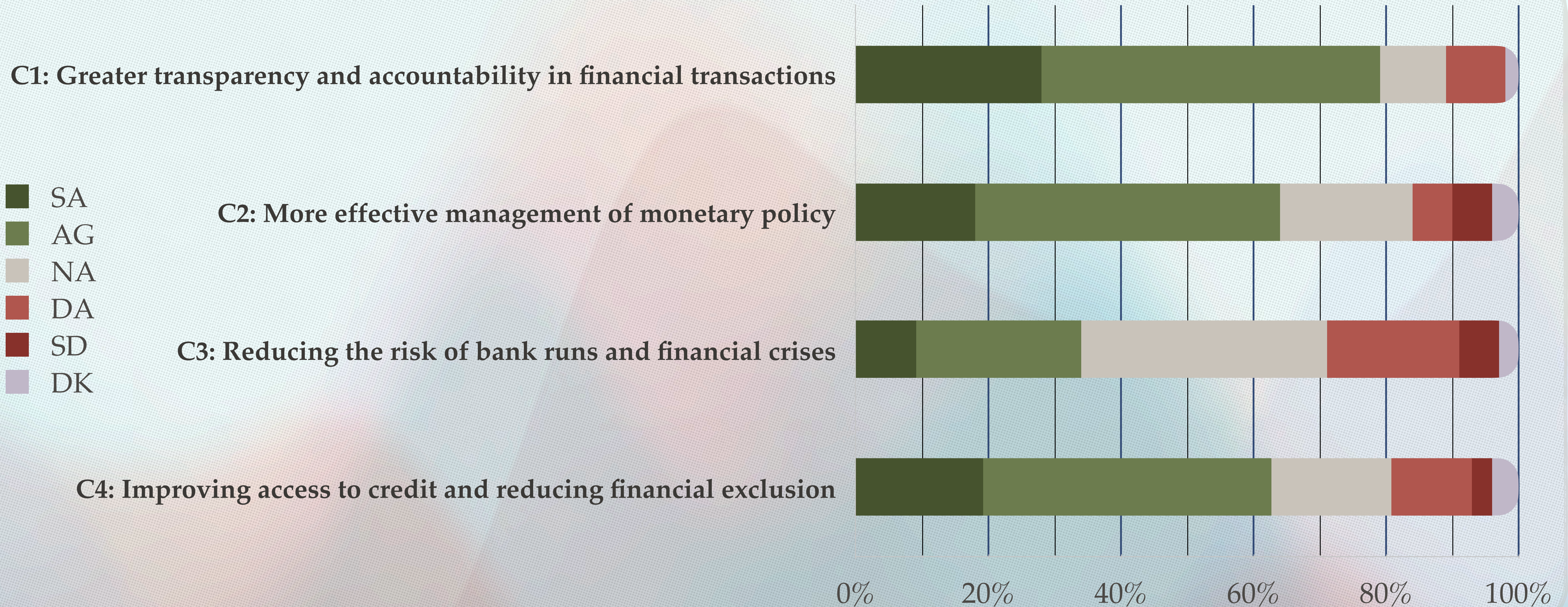
# SURVEY RESULTS

## B: CBDC'S POTENTIAL WEAKNESSES



# SURVEY RESULTS

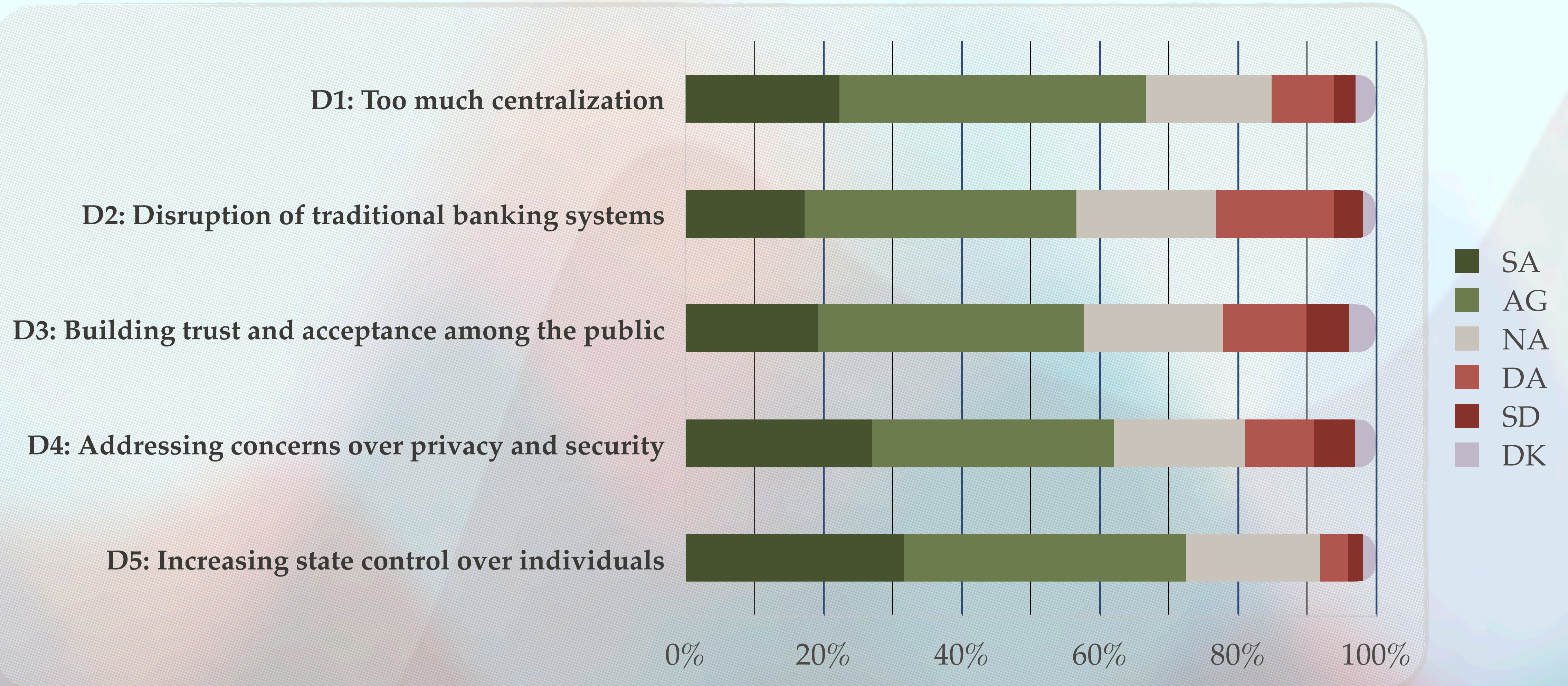
## C: CBDC'S POTENTIAL OPPORTUNITIES





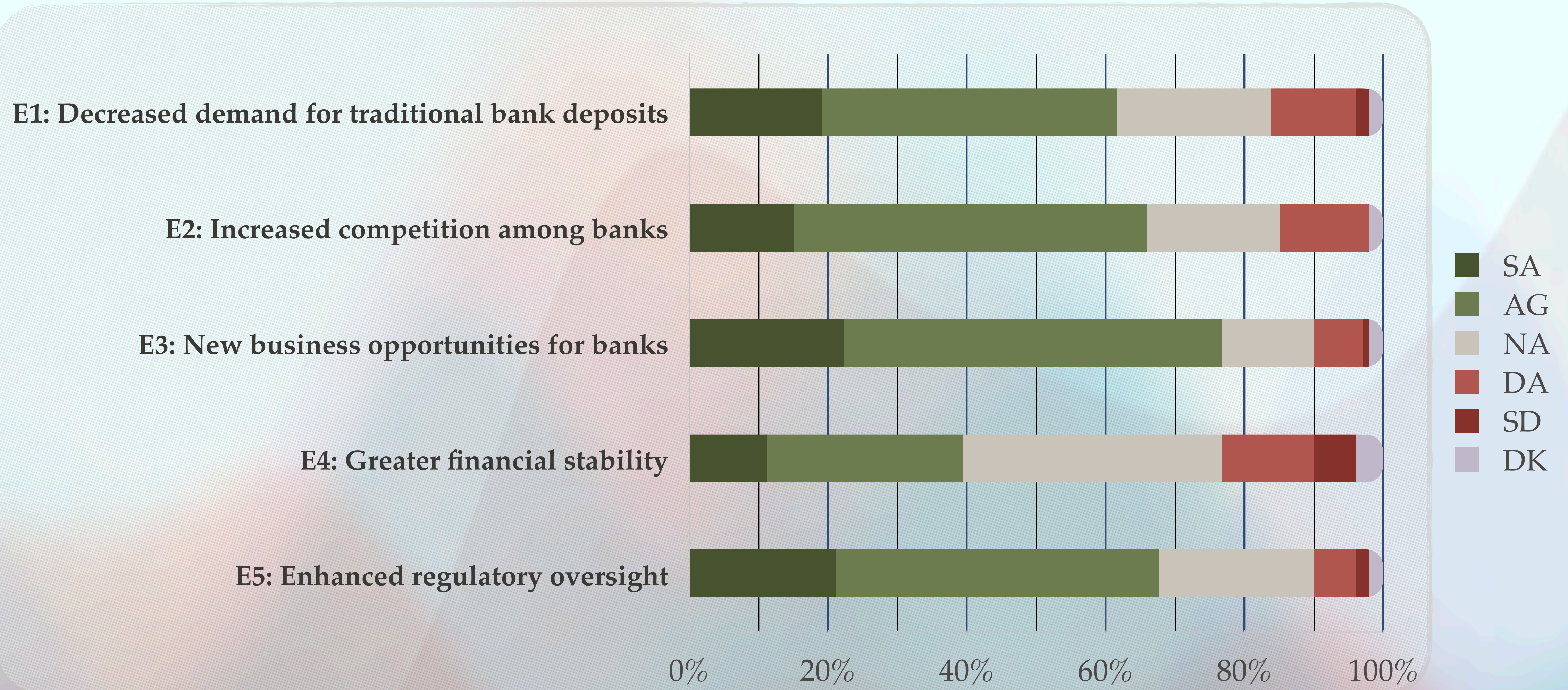
# SURVEY RESULTS

## D: CBDC'S POTENTIAL THREATS



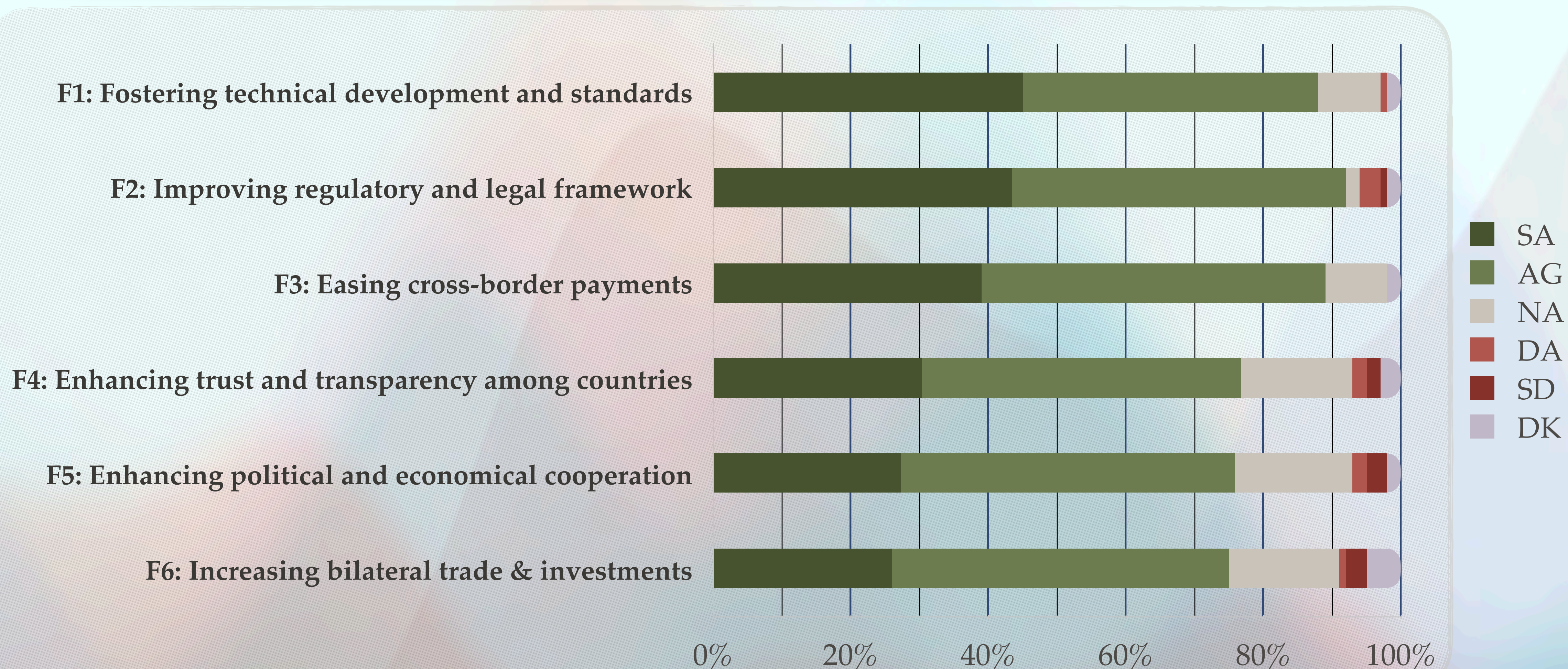
# SURVEY RESULTS

## E: CBDCS CAN POTENTIALLY AFFECT THE BANKING INDUSTRY



# SURVEY RESULTS

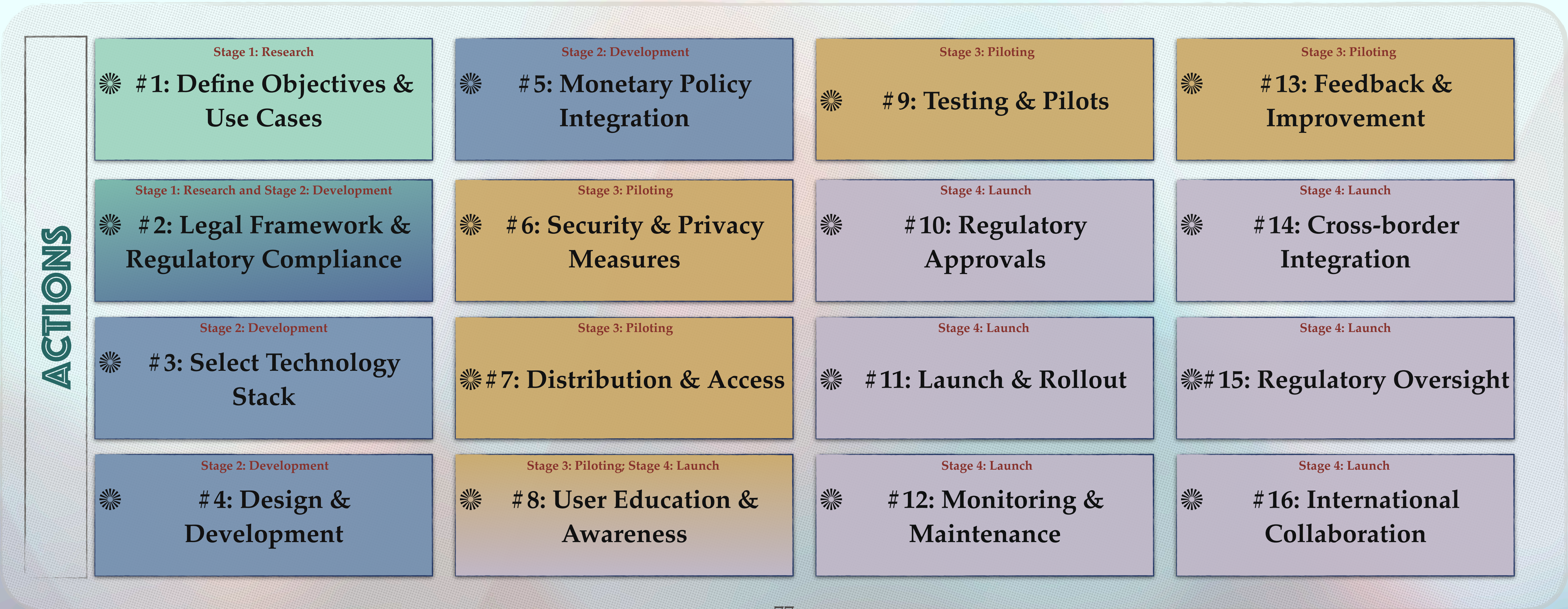
## F: DEVELOPING AND IMPLEMENTING CBDCS IN OIC COUNTRIES REQUIRE INTERNATIONAL COLLABORATION AND COORDINATION IN AREAS:



# CONCLUDING REMARKS

# CONCLUDING REMARKS

Developing and implementing CBDCs is a complex process that involves various stakeholders and considerations. Depending on the stage of CBDC development, the countries are recommended to develop the following steps:



**THANK YOU FOR YOUR KIND ATTENTION!**