Objectives for the Session

- Introduction – the Maldives FinTech/CBDC project
- Innovation facilitation - Role of Central Bank, banks and FinTechs
- Instruments – CBDC, Stablecoins, Tokenized Deposits
- Nature of a Sandbox - experimental vs regulatory
- Objectives and scope for a sandbox regime
- Guidance for policy and regulatory sandbox
- Implementation considerations
- Involving Bank and FinTech Participants in the CBDC Sandbox
- Conclusion and Next steps
Introduction – the Maldives FinTech/CBDC project

• 2022 - National Study on Central Bank Digital Currency and Stablecoin in The Maldives
• 2022 - Policy paper regulatory sandboxes Maldives
• 2023 - Guideline on CBDC and Fintech Sandbox for MMA
• 2023 - UN ESCAP Global Guidance Toolkit Document
• 2023-4 - Discussions with MMA regarding implementation plan
  • Proofs-of-concept, awareness events, FinTech festival plan
  • Set up of FinTech Regulatory Sandbox
  • Set up of CBDC Policy and Regulatory Sandbox
Innovation facilitation
The digital assets market is maturing – will change banking

Digitalization of economic activity worldwide:
- This century has seen a major shift to on-line business
- In finance, growth in FinTech is slanted towards digital assets
- But conventional markets, eg payments, embrace innovation too
- Digital payment has enabled financial inclusion / cash reduction
- Potential for great benefits in digital currencies and blockchain
- Tokenization of assets is a trend with great momentum
- Potential for digital asset markets in improving global liquidity
- We see a maturing market similar to ‘e-business’ in the 2000s

BUT:

Digitalization is a bumpy ride:
- Risks to financial stability and currencies
- Risk to investors and the public
- New kinds of Regulatory challenges

Value bubbles will happen as technologies take off

Dot.com bubble 1997-2002

Crypto bubble 2018-2023

Note the similarities in the curves – investment does not drop back to pre-boom levels

USD 3trn
USD 1.5trn
Current Global Status of CBDCs

In the last 4-5 years, 90% of Central Banks have been working on CBDC experimentation to prepare for future [Blockchain] architectures, protect monetary sovereignty, aid financial inclusion

Affluent/large nations

- China – DECP e-CNY
- India – wholesale and retail
- US – Fedcoin – 5 research studies
- European Central Bank (Stella)
- Brazil (DREX), Kazakhstan – Pilots
- Sweden (e-krona)
- Canada (Jasper)
- Singapore (Ubin)
- Switzerland (Jura, Helvetia)
- Australia (Research Pilot)
- Japan – PoC 1 and 2
- South Africa (Khokha)

Saudi Arabia and UAE (Aber)
- Canada and Singapore (Jasper-Ubin)
- Thailand and Hong Kong (Inthanon-LionRock)
- Australia, Thailand, Singapore, India (Dunbar)
- Thailand, Hong Kong, China, UAE (mBridge) and others

Technical success, but Regulartion and Settlement questions to be studied

Work towards Minimum Viable Product (MVP)

Wholesale Cross-Border Pilots

Most beneficial Use Cases for affluent nations – streamline trade

Early Public Implementations - targeting Financial Inclusion and cash reduction:
- Bahamas
- Cambodia
- China (limited area - Pilot)
- Eastern Caribbean
- Nigeria
- Jamaica – JAM-DEX

Technical success – Ready for the future but “No Pressing Need” to implement now

National Pilots
Roles and responsibilities

• Central Bank
  • Not usual for the Central Bank to be seen as the friend of innovation
  • But in such new areas, the CB must take a lead to explore technologies, risks and how to manage them – most central banks are experimenting
  • Can bring the industry together and provide facilities for experimentation
  • Sandbox concept

• Commercial Banks
  • Good at identifying where the commercial opportunities are
  • Nothing will progress unless someone gets a genuine benefit
  • Understand the cybersecurity issues as well as customer expectations

• FinTechs
  • Can be lighter on their feet than banks in innovation
  • But banks will buy or duplicate the best ideas
  • FinTechs have less experience of the security environment
Digital Instruments
Revolutions in Electronic Payment Systems

Electronic Era 1960s-2000s
- Commercial bank issued payment instruments, strongly backed, wholesale and retail use cases in mainstream markets with good security
- Card payment – credit cards, debit cards, store cards; with ATMs and EftPos
- Internet banking and payment
- Central Bank Financial market infrastructures – RTGS ACH, CSD
- Mobile payment and Instant payment systems

Digital Era 2010s FF
- Cryptocurrencies
  - Blockchain technology and (later) smart contracts
  - Privately issued, public blockchains, anonymous, volatile
- CBDCs
  - Central bank issued, private blockchains, stable, recourse to CB
- Stablecoins
  - Privately issued by third parties, weakly backed (in some cases), used mainly in crypto market, but mainstream banks now
- Tokenized Deposits
  - Tokenization of bank accounts in commercial bank money for payment and Treasury uses by licensed institutions

Regulators have to keep up with the changes and find ways to limit the risks
How are commercial banks using digital currencies?

Banks are wary of regulatory uncertainty - but big players are investing

US examples:

- **J.P. Morgan**

- **USDF consortium**
  - nine members, transfer value on blockchain using USD-pegged tokens

- **Wells Fargo**
  - stablecoin initiative from 2019 used for internal cross-entity book transfers
How are commercial banks using digital currencies?

Elsewhere, regulation has been more holistic:

**Australia** - issuers require an Australian Financial Services License

ANZ and NAB both issue ERC20 stablecoins, ANZ acts as a stablecoin custodian, trades in tokenized carbon credits; and uses them for sustainability metrics; NAB has a green stablecoin initiative

**Japan** –

Has a Stablecoin Law (2023) defining Stablecoins as digital money

MUFG plans to launch the Yen-denominated ‘Progmat Coin’, with multiple partners, focussed on global DvP NFT/crypto asset securities settlement and global treasury

**Europe** - commercial banks may soon use Stablecoins under EU MiCA rules. Already:

KBC in Belgium offers the programmable Kate Coin within the KBC bancassurance environment

Commerzbank in Germany has a stablecoin-based supply chain automation initiative
<table>
<thead>
<tr>
<th>Individual/Counterparty</th>
<th>DvP/Securities</th>
<th>Instant Payment</th>
<th>Treasury</th>
<th>Cross-border</th>
<th>Trade payment</th>
<th>AML/fraud prevention</th>
<th>Lending/ Credit management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual cases</strong></td>
<td>Explore tokenization of in-house and client securities</td>
<td>Intra-bank transfer of TDs, with conditional execution</td>
<td>Domestic Treasury for bank and clients, later expand to cross-border</td>
<td>N/A</td>
<td>Intra-bank Domestic Trade Payment with smart contracts</td>
<td>Smart contracts for AML/fraud detection, options for AI-enhanced smart contracts</td>
<td>Fast collateral mobilization</td>
</tr>
<tr>
<td><strong>Counterparty cases</strong></td>
<td>Programmed atomic domestic securities settlement, cross-border. PvP FX cases</td>
<td>Inter-bank transfer of TDs, with combined inter-bank settlement</td>
<td>Payments - awaits mBridge and Mariana MVP</td>
<td>Domestic Trade Payment with collateral, integrated supply chain M2M etc.</td>
<td>Centralized /shared assessment of suspicious transactions</td>
<td>Collateral mobilization for trade finance including cross-border</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repo/rrepo with smart contract control</td>
<td>Cross-border trade finance/payment without LCs, with integrated supply chain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Nature of a sandbox
Objectives and scope for a Sandbox regime

- “Our Policy is Policy Experimentation”
- Mohamed Shareef - former Minister of State at Maldives Ministry of Environment, Climate Change and Technology

- Looking beyond traditional models is a key element of change, and inclusion of stakeholders from the start of any CBDC project is a major contribution to its ultimate success as they know what customers think.
- Testing individual FinTech products in a traditional “regulatory Sandbox” environment is not the same as testing such products in a CBDC testing ecosystem set up by the Central Bank.
- We anticipate banks developing e-wallet products to contain CBDC for customers as a base product if general purpose CBDC use is envisaged.
- Many central banks prefer to work with wholesale Use Cases first, but e-wallet may still be a good base product for corporate users.

- Financial institutions (banks and FinTechs) can be encouraged to build overlay services on to basic e-wallet products and to integrate the CBDC with their existing financial services products and activities.
- To achieve this, Central Banks can invoke the “CBDC Sandbox” concept to describe its testing ecosystem. The experimental sandbox (or Innovation Hub) concept allows less mature ideas and products to be tested out.
- The participation of relevant Governmental Departments early on is also highly recommended as there may need to be legal changes and changes to government payment processes which can be incorporated into the CBDC scheme.
The UK FCA defined a Sandbox succinctly in 2016 as being “a ‘safe space’ in which businesses can test innovative products, services, business models and delivery mechanisms while ensuring that consumers are appropriately protected.”

- Sandboxes have different purposes
- An Experimental Sandbox / Innovation Hub is as FCA says a safe environment separate from production banking and payment infrastructure in which ideas as well as software can be trialled. This can be a place in which experimentation on Use Case ideas can be done
- A Regulatory Sandbox is a familiar idea from the trialling of FinTech products where current regulations may not apply in the normal way
- A regulatory Sandbox regime is not just to waive certain rules, but to engage in ‘regulatory discovery’ so that the CB and the Innovators can understand each other’s concerns about risk management and product functionality
- A Regulatory Sandbox is not necessarily a physical technical environment – it can be just an oversight regime. The set of regime rules may be re-used from Fintech sandbox
- A product needs to be nearing potential live launch to be eligible for Regulatory Sandbox participation - it must be able to be fully demonstrated, to have completed functional testing and be able to show security and performance characteristics appropriate for live launch
- The experimental Sandbox approach is more suitable for less mature products – may be run by the Central Bank to enable inter-bank collaboration
A Sandbox Pilot Program for a Commercial Bank

- An integrated Sandbox environment for digital currency experimentation, PoCs, Pilots, public trial

- Awareness Training – Multi-level
- Strategy and Use Case Analysis
- Wallet – SDK and standalone devices
- DvP settlement
- Cross-border
- Treasury
- Reconciliation
- Digital Wallets
- Loyalty

- Wholesale CBDC
- Retail CBDC
- Safe environment for PoCs

- Virtual Assets DC

- Remittance
- Cross-border trade payment
- Global treasury - ‘Stablecoin/Tokenized Deposits as a Service’

- Backend and API Enabl-ement

- And in the longer term
Guidance for policy and regulatory sandbox
Sandbox guidelines

• How policy experimentation can be conducted
  • Participation; eliminate 2-tier settlement policy by including non-banks in wCBDC settlement
  • Revise FinTech sandbox guidelines and devise new guidelines for CBDC experimentation
  • Avoid products that may disintermediate the banking system in a way that exposes customers to risks (DeFi problems)

• Fair treatment of institutions
  • There must be an equitable and objective set of rules for entry and exit to the Sandbox regime
  • Avoid creating misleading market signals by including or not including specific organizations
  • Level playing field for large and small banks and FinTechs at low risk

• Regulatory measures – in Sandbox – Regulatory discovery
  • What constraints could be lifted; what risks must be managed

• Pilot trials and public involvement
  • Selected Pilot trial participants from involved organisations, clear commitment to right any financial errors

• Central bank monitoring and control role
Implementation considerations
The Overall Implementation Plan

- Central Banks can implement a FinTech sandbox and evolve to a CDBC sandbox (This is MMA’s plan)
- There are some differences between a CBDC sandbox and a regulatory Sandbox for a broader range of FinTech products
- A CBDC Sandbox is likely owned and physically run by the Central Bank, built around a CBDC vendor product
- A FinTech Regulatory Sandbox may or may not involve a physical testing environment owned and run by Central Bank. The physical environment may be at the FinTechs’ premises, but Central Bank will monitor/supervise the experiments in a regulatory discovery context
- The Sandbox regime for FinTech products can run in parallel with the CBDC-focussed Sandbox.
- The same eligibility criteria and application processes would apply, and similar regulatory discovery opportunities would arise.
Progressing the Sandbox implementation - MMA example

MMA Oversight

Other FinTech products

FinTech Sandbox environment at MMA

FinTech firm internal testbed

FinTech firm internal testbed

FinTech firm internal testbed

CBDC Sandbox environment at MMA, with issuing system

CBDC related FinTech products

Bank CBDC wallets and overlays

Bank CBDC wallets and overlays
## Stages of the FinTech Sandbox Implementation Plan

*From Assylbek Davletov, UN ESCAP project*

<table>
<thead>
<tr>
<th>Actions</th>
<th>Q4 2023</th>
<th>Q1 2024</th>
<th>Q2 2024</th>
<th>Q3 2024</th>
<th>Q4 2024</th>
<th>Q1 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of Guidelines on FinTech sandbox</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identification of any necessary Amendments to the Laws and Regulations to support Sandbox activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Consultations and Stakeholder Engagement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approval of Legislation and Guidelines</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creation of a streamlined Application Process for firms to enter the Sandbox</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource allocation - Assign dedicated regulatory personnel to oversee and support firms within sandbox</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education and Training programs for regulatory personnel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establishing a dedicated committee within the Central Bank to assess applications for the Fintech Regulatory Sandbox</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Awareness for consumers and firms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Official launch of the Sandbox</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Green</strong></td>
</tr>
</tbody>
</table>
Stages of the CBDC Sandbox Plan

1. Preparation, policy, objectives and consultation
2. Sandbox Supplier assessment and Proof of Concept
3. Central Bank Sandbox set-up
4. Central CBDC testing, education and participation
5. Use Case analysis, definition and build by participants
6. Joint testing in the Sandbox
7. Regulatory discovery and alignment for each Use Case / product
8. Sandbox trials and Pilot projects with selected customers
9. Ongoing monitoring leading to broader launch programs
### Outline timing of CBDC Sandbox planned stages

<table>
<thead>
<tr>
<th>Actions</th>
<th>Q4</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation, policy, objectives and consultation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier Assessment and Proof of Concept</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central Bank CBDC Sandbox set-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central CBDC testing; education and participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Case analysis, definition – participants build</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint testing in the Sandbox</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulatory discovery and alignment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sandbox Trials, Pilot projects with real customers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ongoing monitoring, leading to broader launches</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some stages can be shortened or overlapped.
Involving Bank and FinTech Participants in the CBDC Sandbox
The involvement of banks and FinTechs as CBDC participants requires several steps – consultation, education, identification of profitable and worthwhile Use Cases, product build and Sandbox testing with Central Bank, leading to Pilot implementations, possible regulatory adjustments and eventual product releases.

- Policy White Paper and consultation
- Sandbox selection, set up and MMA initial testing of CBDC
- Training, and Analysis of potential Use Cases for Participants
- Participants build products for preferred Use Cases
- Participants test with MMA in the Sandbox environment
- Pilot projects with selected real customers
- Regulatory discovery, adjustment and products’ Sandbox exit

May involve CBDC, Tokenized deposits, other virtual assets
Sandbox Guidance and eligibility criteria apply
Conclusion and next steps
Conclusion

• Central Banks may choose very different approaches to experimenting with CBDCs and other digital currencies/assets
• Some will focus on internal experiments with technical aims
• Others will be keen to involve licensed banks and FinTechs in collaborative projects to develop viable products quickly and manage urgent problems of financial inclusion and cash reduction
• Costs and funding are a serious consideration, and risks are mainly concerned with participation and readiness for real world trials
• Very few countries have reached national launch so far, but some commercial banks using tokenized deposits have launched major products successfully
• PoCs, Sandboxes and Pilot trials as valuable tools for use in the experimental process towards launch of digital currency products
Next Steps for a Central Bank considering CBDC Sandbox experiments

i. Set up a project team including the relevant Central Bank departments and prepare a policies/principles concept paper -

ii. Talk to other central banks who have done similar projects to assess lessons learned

iii. Formulate policy objectives involving Central Bank and Government

iv. Write a consultation paper for the industry and the public (“White Paper”) explaining the scope and objectives

v. Talk to leading suppliers

vi. Write a functional, technical and implementation requirements paper

vii. Conduct supplier shortlisting

viii. Work out how Sandbox and Pilot projects will be hosted – onshore, offshore, outsourcing, cloud etc.

ix. Conduct full RFP exercise with the shortlisted suppliers, to include a PoC exercise and establish the Sandbox testing environment from the winning bidder’s product.
Thank You

Q&A