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After Bitcoin: Central Bank-Linked Cryptocurrencies and their impact on development

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Dr Anton Didenko
Research Fellow, Law Faculty, UNSW Sydney

Presentation outline

1. CBDC and central bank mandates
2. Different approaches
3. Potential benefits
4. Design questions
5. Implementation
6. Challenges

Limitations of payment systems

- Operators of the payment systems:
 - are a source of counterparty risk
 - require discipline
 - can be a source of systemic risk
- Decreasing use of cash in some countries
- Limited instruments of monetary policy
- Immediate settlement with finality – high value payments only
- Cross-border retail payments inefficient
- Ageing infrastructure
- Cash is anonymous and can be used for criminal activities
- Rise of digital alternative currencies (eg Bitcoin)
- Digitisation leads to increased cybersecurity risks for all operators

Central Bank mandates: payment systems

- Article 127(2) of the *TFEU*: “The basic tasks to be carried out through the ESCB shall be: ... to promote the **smooth operation of payment systems**”
- Article 2(5) of the *Organic Law of the Central Bank of Luxembourg*: “... the Central Bank shall **ensure the efficiency and safety of payment systems...**”
- Section 3 of the *Federal Law On the Central Bank of the Russian Federation (Bank of Russia)*: “The objectives of the Bank of Russia are: ... **ensuring stability and development of the national payment system...**”
- Section 10B(2) of the *Reserve Bank Act 1959*: “It is the duty of the Payments System Board to ensure ... the powers of the Bank ... are exercised in a way that ... will best contribute to:
 - (...)
 - (ii) **promoting the efficiency of the payments system**; and
 - (iii) **promoting competition** in the market for **payment services...**”

Central Bank mandates: other

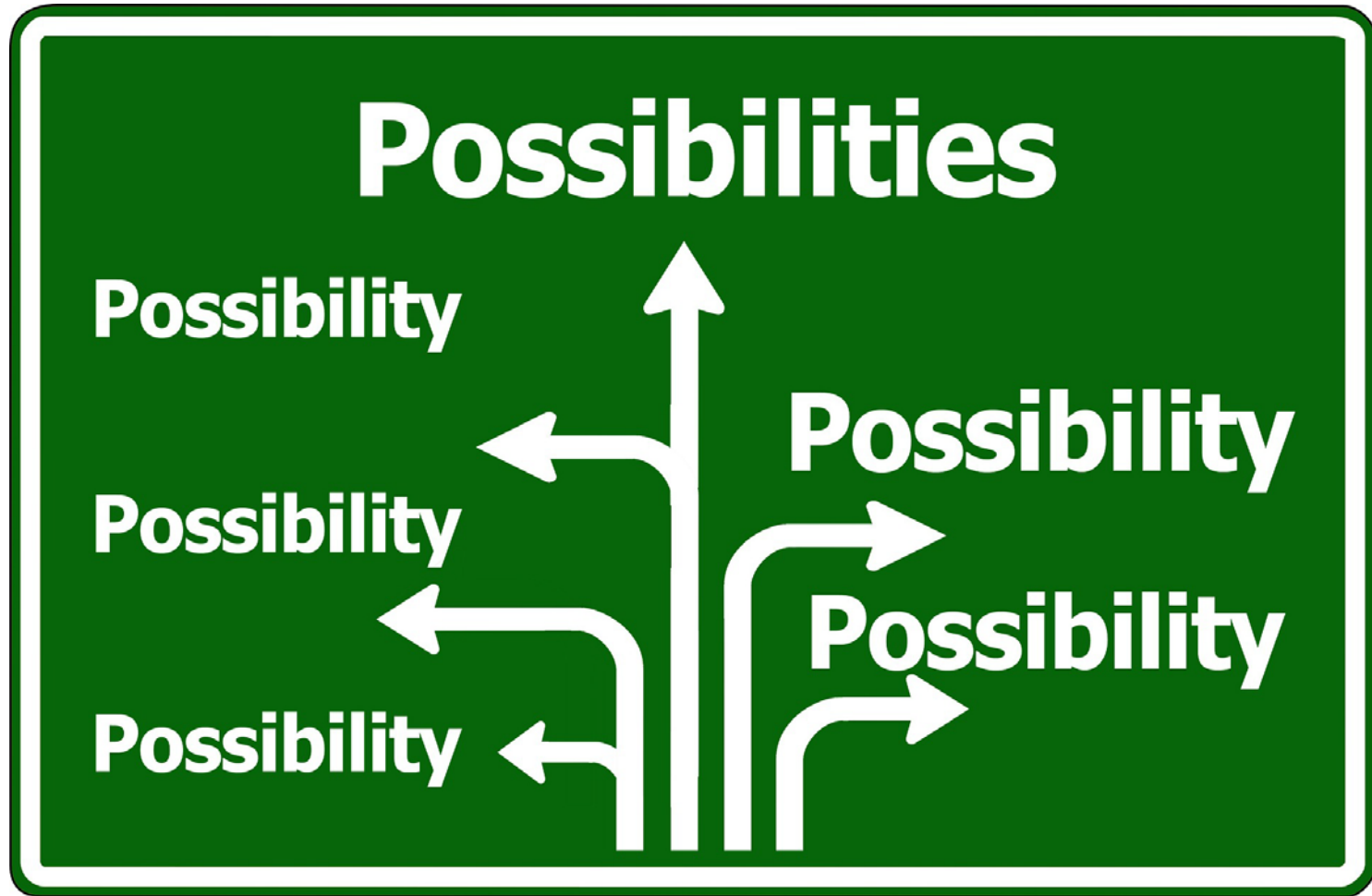
- Article 127(2) of the *TFEU*: “The basic tasks to be carried out through the ESCB shall be: to define and **implement the monetary policy** of the Union ...”
- Section 3 of the *Federal Law On the Central Bank of the Russian Federation (Bank of Russia)*: “The objectives of the Bank of Russia are: **protection and ensuring the stability of the Ruble**; developing and **strengthening the banking system...**”
- Section 10(2) of the *Reserve Bank Act 1959*: “It is the duty of the Reserve Bank Board, within the limits of its powers, to ensure that the **monetary and banking policy** of the Bank is directed **to the greatest advantage of the people** of Australia...”
- Section 10B(2) of the *Reserve Bank Act 1959*: “It is the duty of the Payments System Board to ensure ... the powers of the Bank ... are exercised in a way that ... will best contribute to:
 - (i) **controlling risk in the financial system...**

A new Central Bank Digital Currency?

- “[V]irtual currencies’ means a digital representation of value that is **not issued or guaranteed by a central bank** or a public authority, is not necessarily attached to a legally established currency and does not possess a legal status of currency or money...” (Article 1(2)(d) of the 5th AML Directive)
- Definitions:
 - “CBDC, at the most basic level, is simply **monetary value stored electronically** (digitally, or as an electronic token) that represents a **liability of the central bank** and can be used to make payments.” (Bank of Canada staff discussion paper)
 - “By CBDC, we refer to a central bank granting universal, electronic, 24x7, national-currency-denominated and interest-bearing **access to its balance sheet**.” (Bank of England staff working paper)
 - “[A] CBDC is a **digital form of central bank money** that is **different from balances** in traditional reserve or settlement accounts.” (CPMI 2018)

BUT: the term ‘CBDC’ can be confusing

Different approaches



Different approaches

- Direct CB accounts
- Intermediated CB accounts
- Digital tokens representing rights to fiat currency stored with the CB
- ‘Native’ digital tokens that themselves have the status of fiat

Potential benefits

- Alternative MoE/SoV issued directly by the CB
- Alternative to cash in countries with declining use of cash
- Improved resilience of the payment system
- Improved technical efficiency of settlement systems
- Better monitoring and supervision by central banks
- More diverse monetary policy
- Better pass-through of monetary policy
- Improved levels of financial inclusion
- Platform for future innovation

Key design questions

- Wholesale or retail?
- Token or account based?
- Level of centralisation?
- Availability – 24/7 or not?
- Level of privacy/anonymity?
- Interest payable or not?
- Limits/caps on CBDC use?
- Best underlying technology?

Implementation: wholesale CBDC

- Canada
 - “Securities and cash were brought on-ledger through the issuance of Digital Depository Receipts (DDRs) by CDS and the Bank of Canada, respectively, allowing POC participants to **settle securities against central bank cash on the distributed ledger.**” *October 2018 report*
- Thailand
 - “The BOT and the participating banks will collaboratively design and develop a proof-of-concept prototype for wholesale funds transfer by issuing **wholesale Central Bank Digital Currency.**” *August 2018 announcement*
- Singapore
 - “A **DLT-based RTGS system** reduces the costs and resources for the day-to-day operations and eliminates the risk of the central bank being the single-point-of-failure of the entire financial ecosystem.” *November 2017 report*
- South Africa – Project Khokha
- ECB + BoJ – Project Stella

Implementation: retail CBDC

- Theoretical research (Bank of Canada, Bank of England, Norges Bank, Reserve Bank of New Zealand, Sveriges Riksbank, BIS)
- Ecuador – “**Dinero Electronico**” (2014 – 2018)
 - E-money system operated by the central bank
 - Terminated due to lack of demand
- Venezuela – “**Petro**” (2018 – ongoing)
 - Exchange rate: 1 Petro = 360mln bolivars = 60 USD
 - Sold in an ICO, based on blockchain
 - According to the white paper, given official status
- Marshall Islands – “**Sovereign**” (TBD)
 - Exchange rate: unclear
 - Issued in an ICO, based on blockchain
 - Initial supply – 24mln SOV, but 50% goes to the software developer

Challenges: *ex ante* impact assessment

- Projects in early stages
 - ECB + BoJ (27 March 2018): “However, given that discussions on applying DLT to DvP arrangements are **still at an early stage**, further analysis ... is warranted.”
- Economic benefits are not obvious
 - Bank of Canada: “Finally, the project scope **was not sufficiently broad to determine whether DLT would yield significant cost savings or efficiency gains**. We expect that an expansion of scope across a number of possible dimensions ... would provide such insight.”
 - Bank of England (2018): “This is still an **open question** for many central banks, with the answer likely to vary across countries.”

Challenges: the role of central banks

- Role of the central operator of payment infrastructure
 - Greater involvement in the operation of the payment system
 - Financial intermediation
 - Questionable efficiency in credit allocation
- MAS: “With the potential of operating a DLT-based RTGS system, the **conventional role of a central bank** or payment system operator as the centralised infrastructure operator in the ecosystem **will be obsolete.**”
 - Overall liquidity manager
 - System governance
 - Service Level Agreement governor
 - System auditor and mediator

Challenges: competition

- Competition with **commercial banks**
 - make 'digital runs' much easier on even strong commercial banks
 - reduced income stream for commercial banks
 - outflow of commercial bank deposits
 - commercial banks may have to change their business models
 - BoE recommendations
- Competition with **central counterparties**
 - CCPs may be unnecessary in case of synchronised DLT ledgers
- Competition with **other forms of currency**

Challenges: other

- Economic sovereignty
- Technological sovereignty – ‘black box’ problem
- Legal: application of existing rules, status of legal tender, law reform
- Cybersecurity
- Unclear robustness/reliability of new technologies
- Unexplored consequences for monetary policy
 - increased demand for government securities in case of very high demand for CBDC
 - narrow banking: ‘safer’ banks may choose to engage in riskier lending to maintain profitability
 - seigniorage shift towards CB

Conclusion

- CBDC projects still largely theoretical
- Several ongoing pilot projects and very few retail applications
- Benefits are not clear
- Whichever option is chosen by central banks, cyber risks are becoming ever more relevant
- Potential for CBDC 'battle royale'

Thank you

Dr Anton Didenko

anton.didenko@unsw.edu.au

