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Central bank digital currency: Motivations and Implications

Bank Negara Malaysia Monetary Policy Conference

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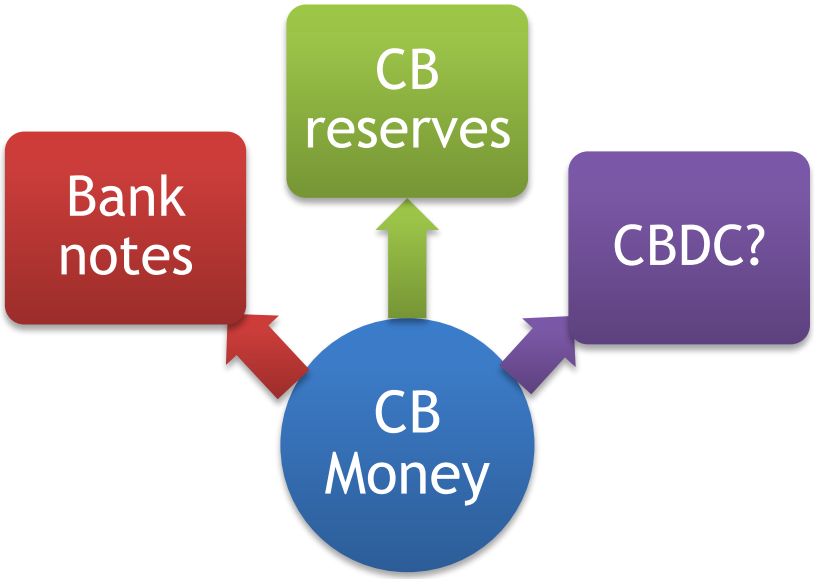
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The views expressed here are solely those of the authors

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What is CBDC?

- CBDC: monetary value stored electronically (digitally, an electronic token) that
  - represents a liability of the central bank
  - can be used to make payments.
- We consider a CBDC that is widely available to the general public to make all kinds of payments
  - CBDC for interbank (wholesale) payments as a special case.
- Important attributes of CBDC need to be determined.



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Outline of presentation: “the devil is in the details”

- Discuss and assess the motivations that a central bank might consider to issue a CBDC.
- Describe the features of a benchmark CBDC modelled on cash.
- Discuss the implications of this particular design.
- Vary some of the features of the benchmark CBDC and re-examine the implications of such a revised design for CBDC.

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Motivations for issuing CBDC



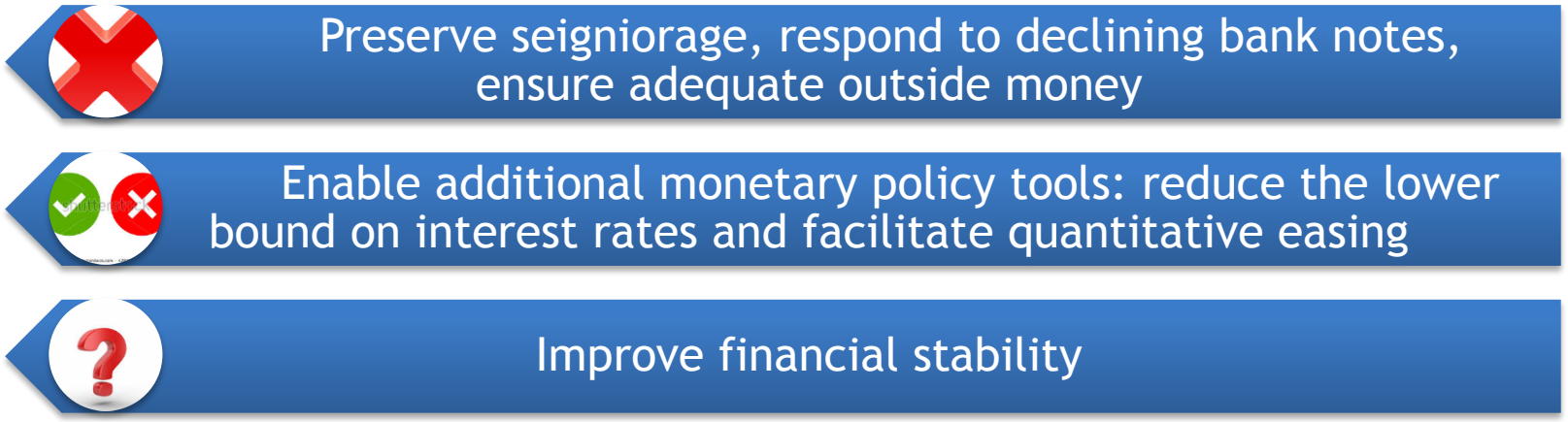
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Possible motivations for issuing CBDC

- Improve efficiency of currency provision
- Preserve seigniorage, respond to declining bank notes, ensure adequate outside money
- Enable additional monetary policy tools: reduce the lower bound on interest rates and facilitate quantitative easing
- Improve financial stability
- Improve efficiency and contestability in payments
- Promote financial inclusion
- Inhibit criminal activity

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Possible motivations for issuing CBDC



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A benchmark CBDC: Like cash



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Why a benchmark CBDC?

- The effects of CBDC
  - depend on the specific design or attributes of CBDC
  - could be significant
  - are difficult to predict
  - the significance of effects and uncertainty increase with the extent of innovation
- The benchmark CBDC is designed to minimize disruption and facilitate learning by having properties similar to cash – a familiar environment.
- This CBDC complements, and does not replace, physical cash.

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The benchmark CBDC: like cash

Attribute	Benchmark CBDC	Bank notes
Denomination	CAD	CAD
Legal tender	Yes	Yes
Convertibility: Exchange between bank notes, reserves, and CBDC	Par	Par
Interest bearing	No	No
Fees	None	None
Access/use	Non-exclusive; anyone who has access to related technology could use	Non-exclusive; anyone can use CBDC; no specific technology required
Availability	24/7	24/7

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The benchmark CBDC: like cash

Attribute	Benchmark CBDC	Bank notes
Confidentiality	Anonymous, or pseudonymous, but subject to AML/KYC	Anonymous, but subject to AML/KYC
Supply by central bank	Perfectly elastic; demand determined	Perfectly elastic; demand determined
Distribution channel used by central bank	Through regulated FIs that have accounts at the CB	Through regulated FIs that have accounts at the CB
Finality/ irrevocability	Timing of irrevocability depends on technology solution	Immediate, at time of transaction
CBDC payment network structure	Distributed, bilateral; not tiered	Distributed, bilateral; not tiered

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Implications of the benchmark CBDC: CB seigniorage, monetary policy, banking and financial system, contestability in payments



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Implications of the benchmark CBDC for seigniorage

- Seiginiorage = assets held by CB (CBDC+cash) *R – CB costs
- Will there be demand for CBDC?
  - CBDC may be used to make payments but demand depends on merchant acceptance and consumer adoption.
  - CBDC may be held as a store of value but it earns no interest.
  - CBDC may also be used in the underground economy and criminal activity, similar or even superior to cash.
- But the demand for cash is likely to decrease because of substitution from cash to CBDC.
- And providing two types of CB money will result in higher costs because of smaller economies of scale.

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Implications for monetary policy

- Like cash, CBDC is supplied passively and is not likely to affect monetary policy
- Also the demand for CBDC is not likely to be significant – pays no interest but anonymous
- The CB is the ultimate supplier of CB reserves, bank notes and CBDC, and so the CB can set related terms and conditions to implement monetary policy
- May facilitate “helicopter drop” type of quantitative easing.
  - But since CBDC is anonymous and could be held by non-residents, the effect on the domestic economy may be substantially smaller if it is held in large amount by foreigners.

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Implications for the banking system

- Will there be a significant shift to CBDC from bank deposits?
  - Unlikely since the benchmark CBDC does not pay interest and is, like cash, subject to loss and theft (anonymous).
- If there were a material impact on deposits,
  - banks would respond by increasing interest rates on deposits or by bundling superior services on such accounts to sustain their funding.
  - More on banking system response later.

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Implications of benchmark CBDC: Summary

- Unlikely to have any significant implications for seigniorage, monetary policy, the banking/financial system and payments
- Would promote financial inclusion
- Likely to facilitate the underground economy and criminal activity, since it is anonymous and easy to transfer in large amounts

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Interest-bearing CBDC and its implications



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Features of interest-bearing CBDC (I-CBDC)

- Paying interest on CBDC will affect other attributes of the benchmark CBDC
  - Can an interest bearing CBDC be anonymous or pseudonymous?
  - Paying interest is not compatible with anonymity or pseudonymity because of income tax requirements.
  - Paying interest may require non-par convertibility or restricting the supply of bank notes under certain conditions.
  - Other attributes are similar to the benchmark CBDC.

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I-CBDC and monetary policy

- Effects on seigniorage unclear
  - Paying interest would reduce seigniorage
  - The demand for CBDC relative to bank notes (pays interest, not anonymous)
- I-CBDC gives the CB ability to directly influence interest rates affecting consumers and businesses
- Historically, CB has been able to exert significant and predictable influence on interest rates through the setting of the policy rate
- When policy rates are at negative levels and banks are not passing on negative rates to their customers, the CB can exert more direct influence on interest rates generally through I-CBDC (only if bank notes were eliminated)
- Direct control of consumer rates might not be desirable
  - Seen as directly reducing income of certain segments of the population
  - Could invite political interference and affect operational independence

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I-CBDC, and Banking and the financial system

- Will there be significant shift from deposits to CBDC?
  - I-CBDC is like bank deposits: safe-keeping of wealth, earn interest income, and make payments
  - I-CBDC is also risk free

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I-CBDC, and Banking and the financial system

- In response to shifts from deposits to CBDC, banks would respond by
  - raising interest rates on deposits to offer a spread over I-CBDC to reflect the marginal credit risk
  - bundle banking and financial services with deposits to retain customers
- To maintain profit margins, banks
  - would have to become more efficient
  - would raise fees and interest costs for customers, especially those who have the lowest price elasticity of demand
  - could also go up the asset risk curve to increase returns
  - could suppress intermediation
- Likely scenario:
  - In normal times, agents would hold bank deposits (for rates and services)
  - But when under stress, large shifts into I-CBDC, thus increasing volatility

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Conclusions

- Some attributes of the benchmark CBDC are problematic, most notably anonymity – which would facilitate criminal activity.
- CBDC (whether interest-bearing or not)
  - is neither necessary nor sufficient to reduce the ELB.
  - would motivate endogenous responses by financial intermediaries to compete effectively with such CBDC.
- Overall, motivations for issuing CBDC are not compelling, except increasing contestability and efficiency in payments.
- This analysis does not consider the technological challenges and the costs of issuing CBDC (setup and operating costs, cyberattacks, and reputational risks).
- As a practical matter, given the complexity and uncertainty associated with introducing CBDC, central banks inclined to issue CBDC should proceed cautiously and incrementally.

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Our Three Lines of Engagement on Fintech and DLT



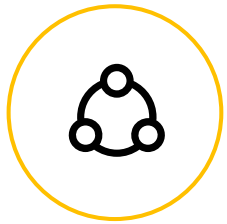
ECONOMIC RESEARCH

Researching private and central bank digital currencies and other uses of Distributed Ledger Technology (DLT)



EXPERIMENTS AND PROJECTS

Working with academics and the private sector and using test cases to deepen our understanding of DLT



COLLABORATION ON THE REGULATORY AGENDA

Contributing to the regulatory agenda through collaboration with national and global regulators