



Central Bank Digital Currencies: From design to implementation

Charles M. Kahn

Professor Emeritus

Department of Finance, Gies College of Business
University of Illinois, Urbana-Champaign

IV Fintech Forum Meeting
CEMLA, March 23, 2021

A hot topic:

Central banks issuing their own electronic alternatives to cash.

- A decade ago, not on the radar
- A few years ago: the preserve of starry-eyed academics and techies
- Now the subject of serious policy work by regulators



A Revolution in Payments?

We've been here before (see e.g. *Time Magazine* "The Future of Money" April 27, 1998)

What is new this time: consequences for central banks

Jurisdictions Where Retail CBDC Is Being Explored (as of March 17, 2021)

Where central banks have launched or piloted (or soon will)

- Bahamas (fully launched), Ecuador (pilot done & project discontinued), China (pilot launched), Uruguay (pilot completed), **Eastern Caribbean (pilot launch now)**

Where central banks have done proofs of concepts (or soon will)

- Jamaica, Sweden, Korea, Ukraine

Where central banks are in advanced stages of research and development

- **Canada**, United Kingdom, **Euro Area**, United States, Japan

Where central banks are still in the exploratory stages

Australia	Brazil	Chile	Curaçao en Sint Maarten	Denmark	Eswatini	Finland
Ghana	Hong Kong SAR	Iceland	India	Indonesia	Israel	Kenya
Madagascar	Malaysia	Mauritius	Morocco	New Zealand	Norway	Philippines
South Africa	Switzerland	Thailand	Trinidad and Tobago	Tunisia	Turkey	Russia

(also according to reputable news sources Bahrain Lebanon Egypt Pakistan Haiti Palestine Iran Rwanda Kazakhstan)

Source: John Kiff

<https://kiffmeister.blogspot.com/2019/12/countries-where-retail-cbdc-is-being.html>

Many potential reasons for central banks to be interested in digital currencies

- Innovation in retail payments
- Replacing cash
- Improving monetary policy at zero-lower-bound
- Financial inclusion
- Simplifying wholesale transactions
- Improving payment from government to citizens



A key political reason: Fear of Irrelevancy

Will the central bank lose connection to the payment system?

(And possibly its link to monetary policy/unit of account?)

Note difference in Central Banks' Response
to Bitcoin and to Libra

CBDC: the shiny new toy

Issues facing central banks

- **Is CBDC the right tool for particular problems?**
- **What are the prerequisites?**
- **What issues need to be considered in CBDC design?**



Particular objectives for Emerging Market and Developing Economies

- **Financial inclusion**
- **Reducing costs and risks of physical cash**
- **Reducing dollarization**



Protection against dollarization

- Yes, someday, if transaction convenience is the driver
- No, if costs of inflation are the driver



Desirable features of cash (Fed consumer survey)

- Low Cost to User
- Ease of Acquisition and Setup
- Widespread Acceptance
- Convenience (speed, ease of use)

- (Privacy)
- (Reliability)



Thus cash likely to remain in the mix

- Reducing the savings from introducing CBDC



- Other alternatives
- Faster payments
- Mobile operators
- Antitrust policies and payments operator supervision



- Prerequisites for launching a CBDC
- Technical resources to devote to decision making and evaluation
- Governance, regulatory and supervisory frameworks
 - Privacy protection
 - Wallet and third party provider framework
- Technological infrastructure
- Cybersecurity capabilities



- A Modest Proposal
- Focus on
 - interoperability
 - system stability (offline facilities, cyber defense)
 - privacy/payment integrity tradeoff
- Let private sector develop use cases
 - except, *perhaps*, the most basic ones



Interaction with Private Payment Service Providers

- Competition stimulation
- Standardization
- Maintain flexibility for potential new features
 - smart contracts
 - interest and direct payment
 - cross-border



- The Australian Analogy
- Australian Fast Payments Strategy: Provide the rails, let the private sector provide the value-added services
- Suggestion for CBDC: provide the medium (and possibly the most basic services), let the private sector provide the value-added rails



- Clear advantages:
- Encouraging innovation
- Keeping the central bank in the game



- Interoperability
- What standards for a payments provider to move customer funds onto or off of its system (into/out of a bank account or to/from another payments provider)



- Stability
- What are the provisions for offline usage?
What are the provisions for recovery of funds from operational problems? Who bears fraud risk?



- Privacy/Payment Integrity

Paying your taxes is a good thing.

Privacy is *also* a good thing.

“Money Is Privacy” (2005) Kahn, McAndrews, and Roberds,
International Economic Review

A role for a variety of payments systems to accommodate different mixes

“Payment Systems and Privacy” (2018) Kahn, *St Louis Federal Reserve Bank Quarterly Review*,

- Relation to Synthetic CBDC
- Distinction between CBDC and s-CBDC (Adrian et al) is minor if payments regulation and deposit insurance adequate
- Common focus on relation of central bank to other payment service providers



- Central bank roles
- Interoperability
- Privacy
- Payments integrity
- Network stability

The same considerations are central to designing CBDC



- Conclusion
- CBDC *can* be the solution to a variety of payments issues, but alternatives should be considered, such as faster payment initiatives and encouragement of private innovations
- Adequacy of technical, security and legal structures a prerequisite to CBDC adoption.



- Conclusion

The design considerations for CBDC parallel those of retail payments system networks: stability, interoperability, and payment integrity

Thus, whether they issue CBDC or not, central banks key role remains standard-setting for the use of central bank money in digital applications





COLLEGE *of*
BUSINESS
at ILLINOIS