

# Comparing Means of Payment: What Role for a Central Bank Digital Currency

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# Overview

## **Research Question**

- How does general-purpose CBDC compare with existing central bank payment services? Phrased another way, what is the potential benefit of a CBDC as a means of payment?

## **Framework for Comparing Means of Payment**

- Measure cash, RTGS, RTGS+, and CBDC along seven broad categories

## **Results**

- Though a CBDC will never be able to fully replicate all characteristics of existing services simultaneously, in certain circumstances, it has the potential to be an improvement over existing modes of payment

# Central Bank Payment Services

- Central banks typically issue money in the form of banknotes and bank deposits
- Financial institutions are able to move these funds from one institution to another through central bank-operated payment services
  - The Federal Reserve maintains several services to facilitate wholesale and retail payments, include a check-processing service; FedACH<sup>®</sup>; and the Fedwire<sup>®</sup> Funds and National Settlement Services
  - In August 2019, the Federal Reserve announced that it would develop the FedNow<sup>sm</sup> Service, a new interbank 24x7x365 real-time gross settlement (RTGS) service with integrated clearing functionality to support instant payments in the United States

# Central Bank Digital Currency

CBDC would be a new type of central bank money

- “digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank”

Because no clear consensus exists on the key design characteristics of a CBDC, proponents of CBDC tend to envision a CBDC that can provide a long list of benefits

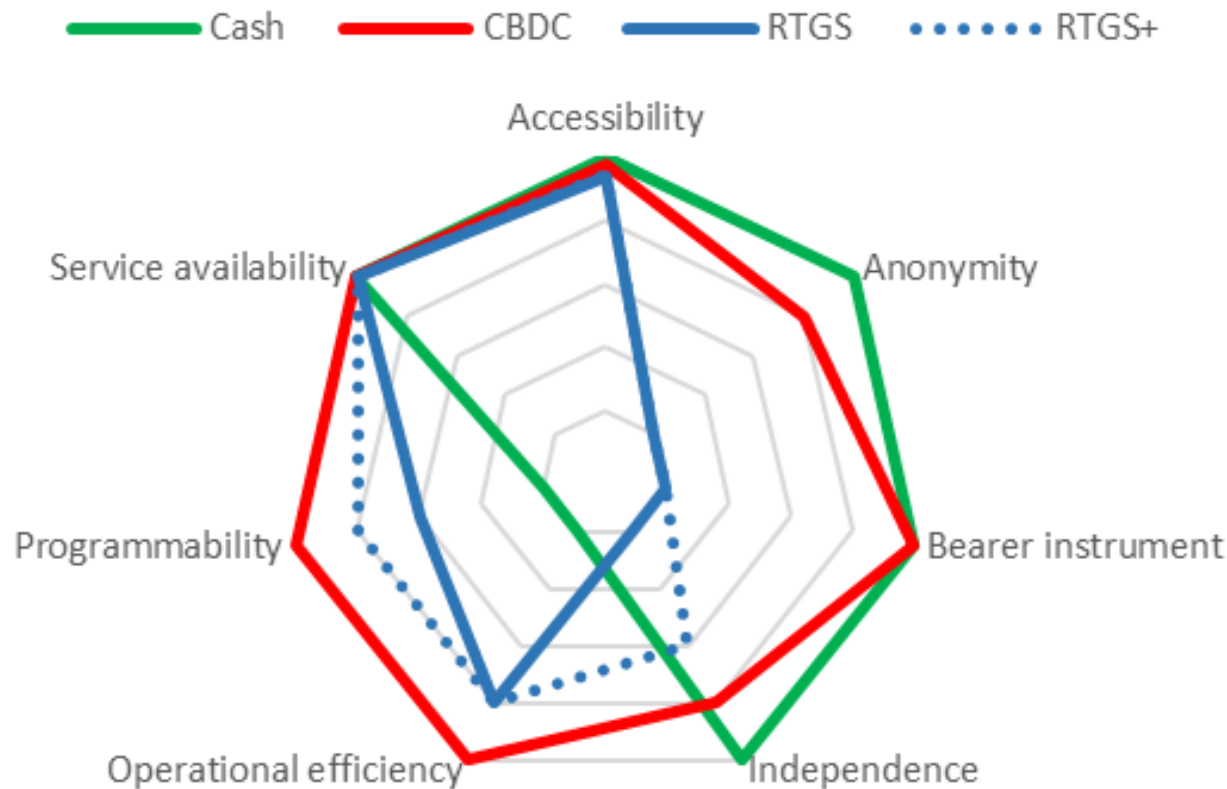
Our analysis limits these potential benefits to those directly related to a payments system

# Framework for Comparing Means of Payment

Measure payment mechanisms along seven broad categories:

- *Accessibility* (consumer access to payment mechanism)
- *Anonymity* (private identity for transactions)
- *Bearer instrumentality* (instrument payable to anyone in possession of it)
- *Independence* (degree of intermediation)
- *Operational efficiency* (for scoring: central bank costs)
- *Programmability* (automatic execution of operations as part of core platform)
- *Service availability* (available 24/7/365)

# Comparison of Central Bank Payment Mechanisms



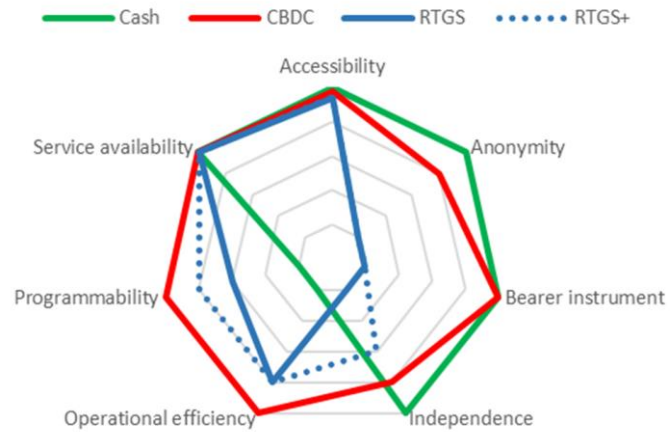
Incorporating all possible design features, CBDC scores:

- higher than cash and RTGS on programmability and potential operational efficiency
- lower than cash on anonymity and independence
- close to RTGS and cash on service availability and accessibility
- equal to cash on bearer instrumentality

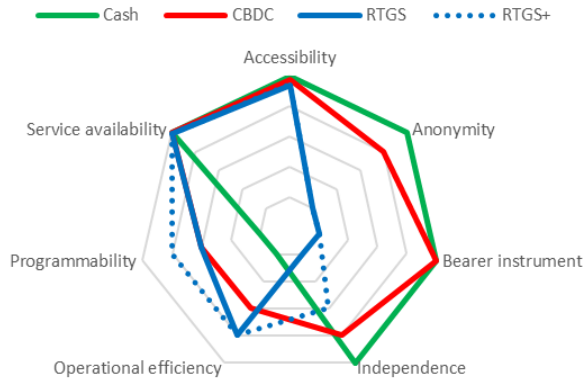
The points, however, do not consider tradeoffs between categories. A single CBDC design would not be able to receive all these scores simultaneously

# CBDC Design Choices Matter

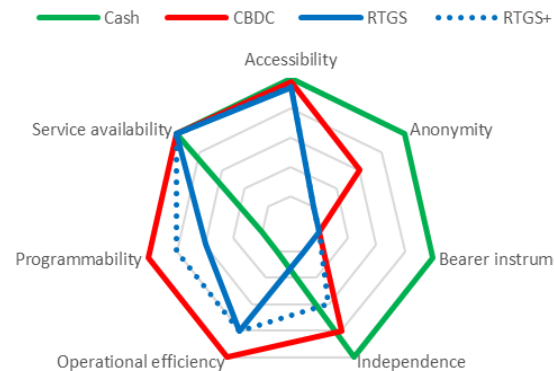
## Design Agnostic CBDC



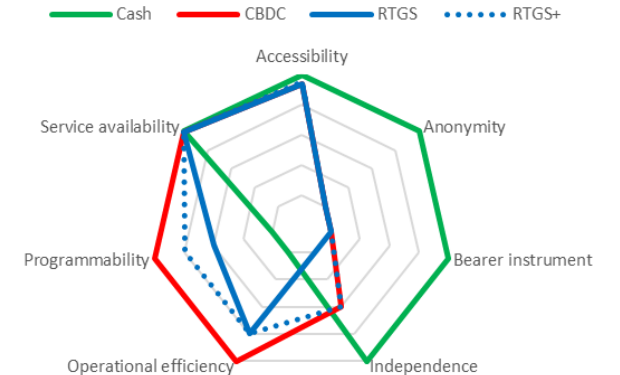
## Cash equivalent CBDC



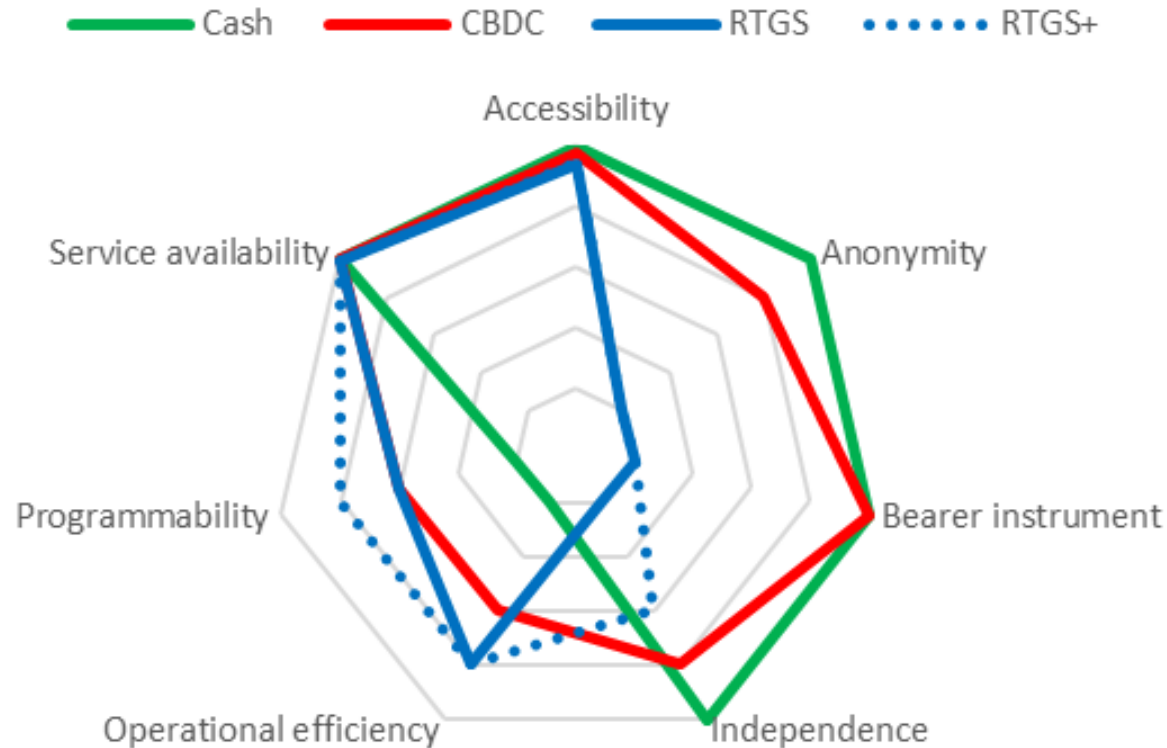
## Account-based CBDC



## Hybrid CBDC



# Cash equivalent CBDC



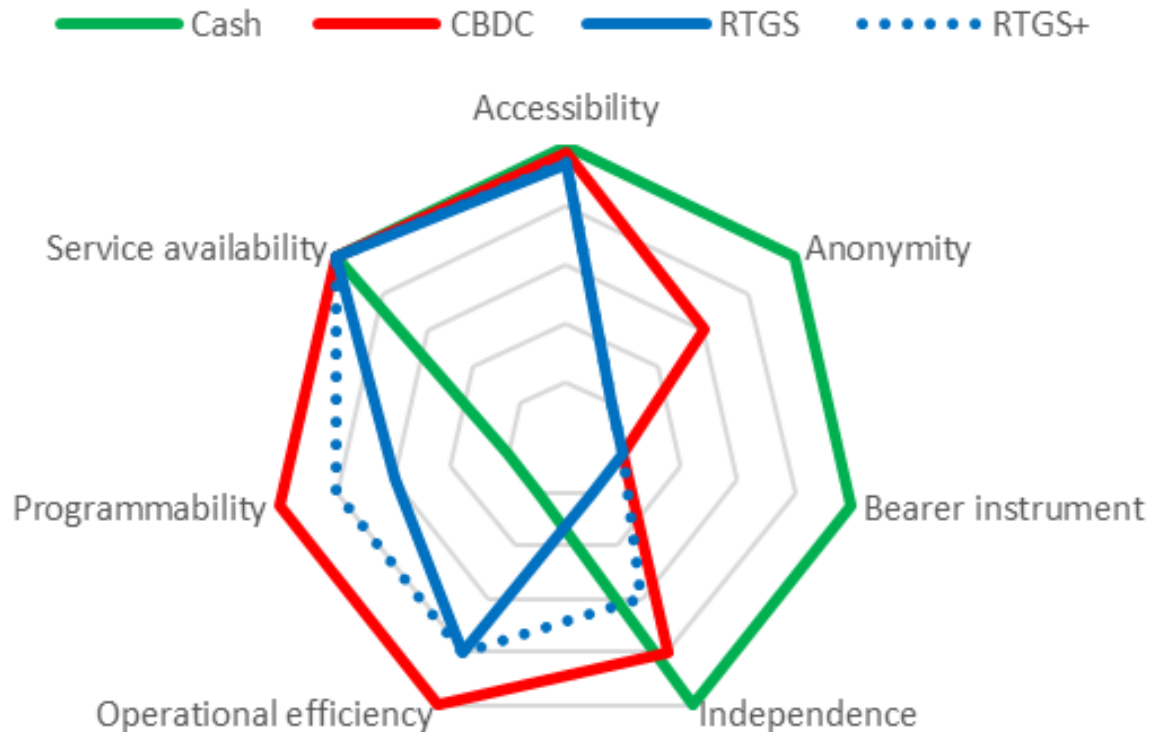
A cash equivalent CBDC is one in which the CBDC is designed as a bearer instrument with offline capability

Cash equivalent CBDC scores:

- lower than cash, but higher than RTGS, on anonymity and independence
- Higher than cash, but lower than RTGS, on operational efficiency
- A CBDC cash equivalent could potentially have the same level of programmability as an RTGS system that allows for external APIs



# Account-based CBDC

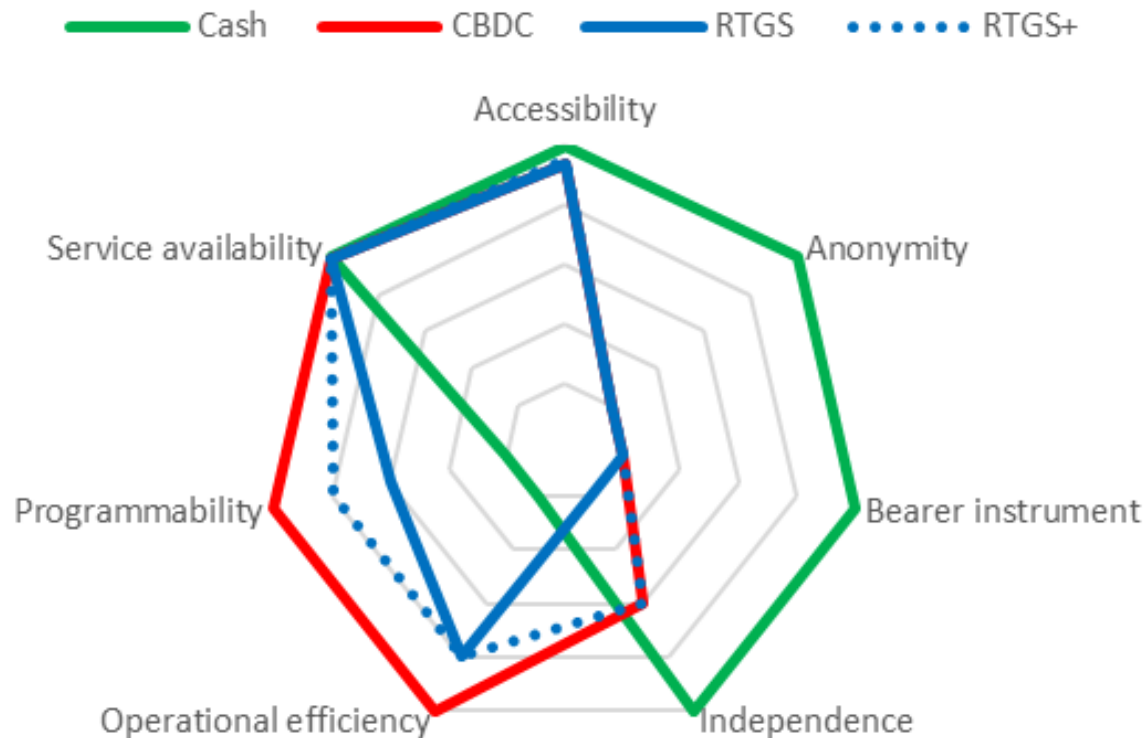


An account-based CBDC is the effective equivalent of providing the public with direct access to central bank accounts (could be built on a new platform)

Account-based CBDC scores:

- lower than cash, but higher than RTGS, on anonymity and degree of independence
- higher than RTGS on programmability and operational efficiency (assuming new platform)

# Hybrid CBDC



A hybrid CBDC is one in which CBDC is issued by the central bank and intermediaries handle payments

Hybrid CBDC scores:

- higher than cash and RTGS on programmability and operational efficiency
- lower than cash, and equal to RTGS, on independence and anonymity

# Conclusion

- CBDC will never be able to fully replicate all characteristics of cash and RTGS simultaneously
- In certain circumstances, CBDC has the potential to be an improvement over both existing modes of payment
- Because there are tradeoffs, central banks will need to decide which features a CBDC should improve upon and choose the archetype that can best achieve these goals