Central Bank Digital Currency and Quantitative Easing

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Research question:

- What are the effects of introducing a CBDC while conducting quantitative easing?

Methodology:

- We introduce an interest-bearing CBDC in a 2-period model, and we study how it changes the economic allocations.

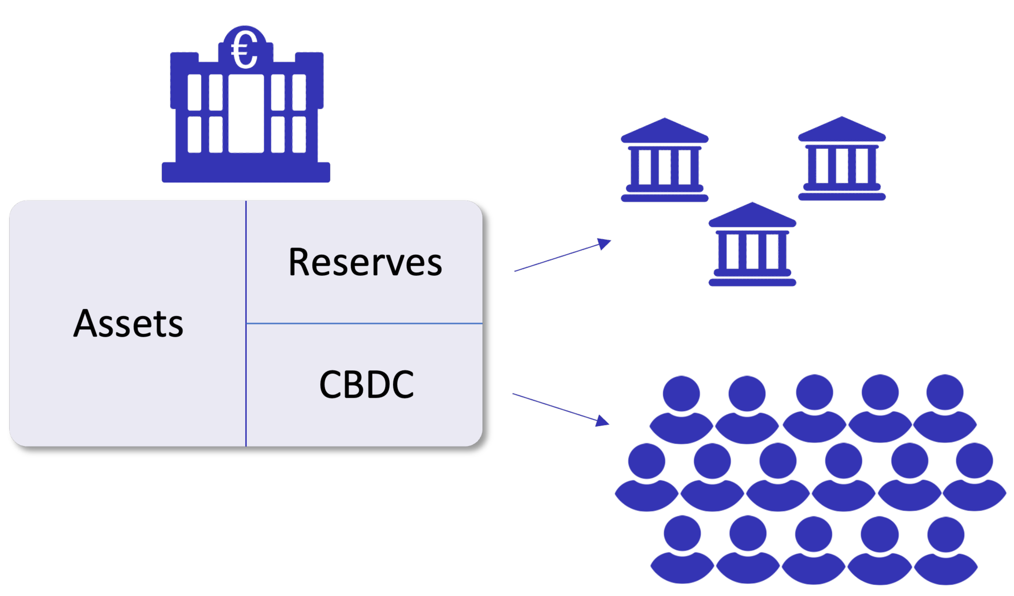
Results:

- Commercial banks optimally use their excess reserves to accommodate households' demand for a CBDC.
- If the demand for a CBDC is low, it is possible to introduce a CBDC neutral to the economy.
- If the demand for a CBDC is high, lending decreases.
- Introducing a CBDC is likely to render quantitative easing a quasi-permanent policy.

What is a Central Bank Digital Currency?

"[A CBDC is] a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank."

(BIS, 2020)



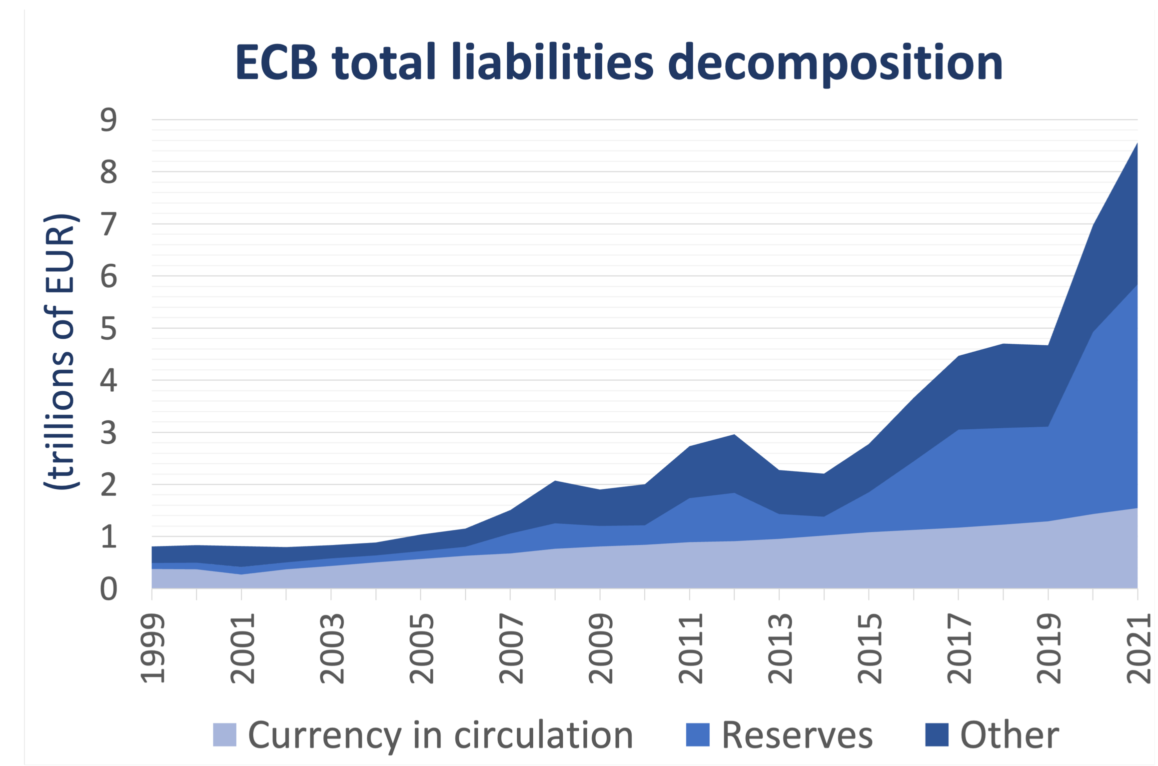
"The digital euro would be like euro banknotes, but digital. It would be an electronic form of money, issued by the Eurosystem, and would be accessible to all citizens and firms."

(ECB)

Motivation

When conducting quantitative easing, the central bank creates new reserves and uses them to purchase assets. This leads to a larger balance sheet and an abundance of reserves in the banking system.

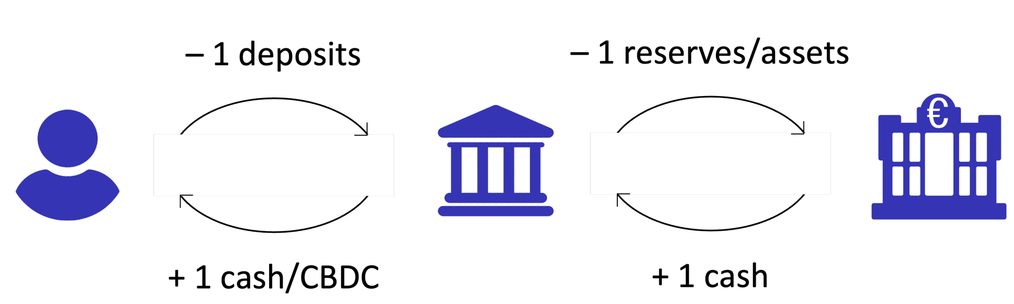
What happens if the central bank adds a CBDC to its liabilities?



Source: ECB website

CBDC introduction mechanism

Buying CBDC is like withdrawing cash.



When households want to transfer 1 unit of their savings from bank deposits into a CBDC, the commercial bank has to transfer 1 unit of resources to the central bank. How?

- Liquidate 1 unit of assets in favour of the central bank
- Swap 1 unit of excess reserves into 1 unit of CBDC

$$cost_{swap} < cost_{liquidation}$$

The commercial bank prefers to liquidate excess reserves to accommodate households' demand for a CBDC.

Reverting quantitative easing

Tapering: the central bank reverts its asset purchase programmes by selling assets back to the financial sector in exchange for reserves.

This operation would be much harder after introducing a CBDC for two reasons:

- Reserves have been transferred to households in the form of CBDC deposits
- Deposits tend to be inelastic

The adoption of a CBDC under quantitative easing might render this policy quasi-permanent.

CBDC impact under quantitative easing

Low CBDC demand (≤ ~25% eurozone deposits):

- Since the reserve requirement is not binding, the commercial bank prefers to reduce its excess reserves to accommodate the demand for a CBDC.
- The loss in bank deposits is fully compensated by a reduction in reserves.

Lending to the economy remains unchanged.

High CBDC demand (> ~25% eurozone deposits):

- The commercial bank swaps excess reserves for CBDC until the reserve requirement is binding.
- For each additional unit of CBDC, the commercial bank is forced to liquidate assets.
- There is no compensation for the loss in deposits.

Lending to the economy decreases.

Selected literature

[1] M.K. Brunnermeier and D. Niepelt.
On the equivalence of private and public money.
Journal of Monetary Economics, 106:27–41, 2019.

[2] Bank for International Settlements (BIS).
Central bank digital currencies: foundational principles and core features.
2020.

[3] M. Magill, M. Quinzii, and J.C. Rochet.
The safe asset, banking equilibrium, and optimal central bank monetary, prudential and balance-sheet policies.
Journal of Monetary Economics, 112(C):113–128, 2020.