Central Bank Digital Currency and banks' disintermediation

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COURSE ON MACRO STRESS-TESTING, IMF STI

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This presentation represents personal views only

Key questions today

1. What is Central Bank Digital Currency (CBDC)?

2. Will CBDC disintermediate banks?

   A. How large should we expect disintermediation to be?

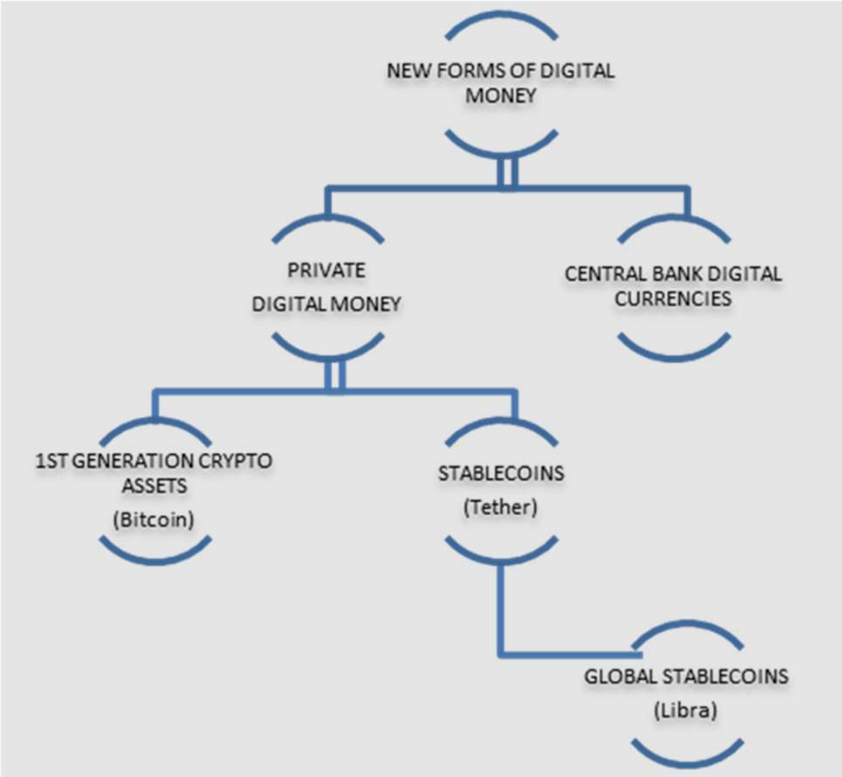
   B. What is the impact on aggregate liquidity?

1. What is Central Bank Digital Currency (CBDC)?

(Retail) Central Bank Digital Currency is...

- A digital **liability** issued by the **central bank**
- **Same unit of account** of local currency
- Accessible by the **whole population**, legal tender

- Different from **privately issued digital money**
  - Crypto-assets (e.g. Bitcoin): usually not money
  - Stablecoins: crypto-assets that aim to achieve a stable value.
  - E-money
- Note: today we will not talk about **wholesale** CBDC (accessible by selected financial institutions)



A multitude of reasons to consider CBDC

Determining factors

- Lower cash use
- Dominant private payment firms
- Entry of (bigtech) stablecoins
- New technologies

Central bank goals	Benefits of CBDC
Safety, resilience, market discipline	• Cheap, reliable government alternative • In domestic unit of account
Financial inclusion	• Payments to poor, isolated, unbanked, non-economically viable
Efficiency of government services	• Lower costs of cash management • Direct transfers
Catalyst for innovation	• Programmable money • PvP, DvP with tokenized assets
Rights of citizens	• Widely available sovereign-backed money

Countries exploring retail CBDC (not exhaustive)

Central Banks have launched or doing pilots	Bahamas China Eastern Caribbean Jamaica Nigeria Uruguay
Central Banks are doing proofs of concepts	Japan Ghana Korea Sweden Ukraine
Central Banks in advanced stages of research	Canada Euro area Mauritius Russia United Kingdom United States and more…

2. Will CBDC disintermediate banks?

Banks’ disintermediation

Will digital money compete with banks deposits?

- As a means of payments: likely
- As store of value: it depends on many factors (e.g. remuneration, alternative options)

Scenario 1. Run-risk during system crises

Digital money increases probability of run-risk?

- Individual bank runs: probably not (runs among banks can already happen easily)
- System bank crisis: possible, but safe assets already exists. Deposit insurance and liquidity provision would help

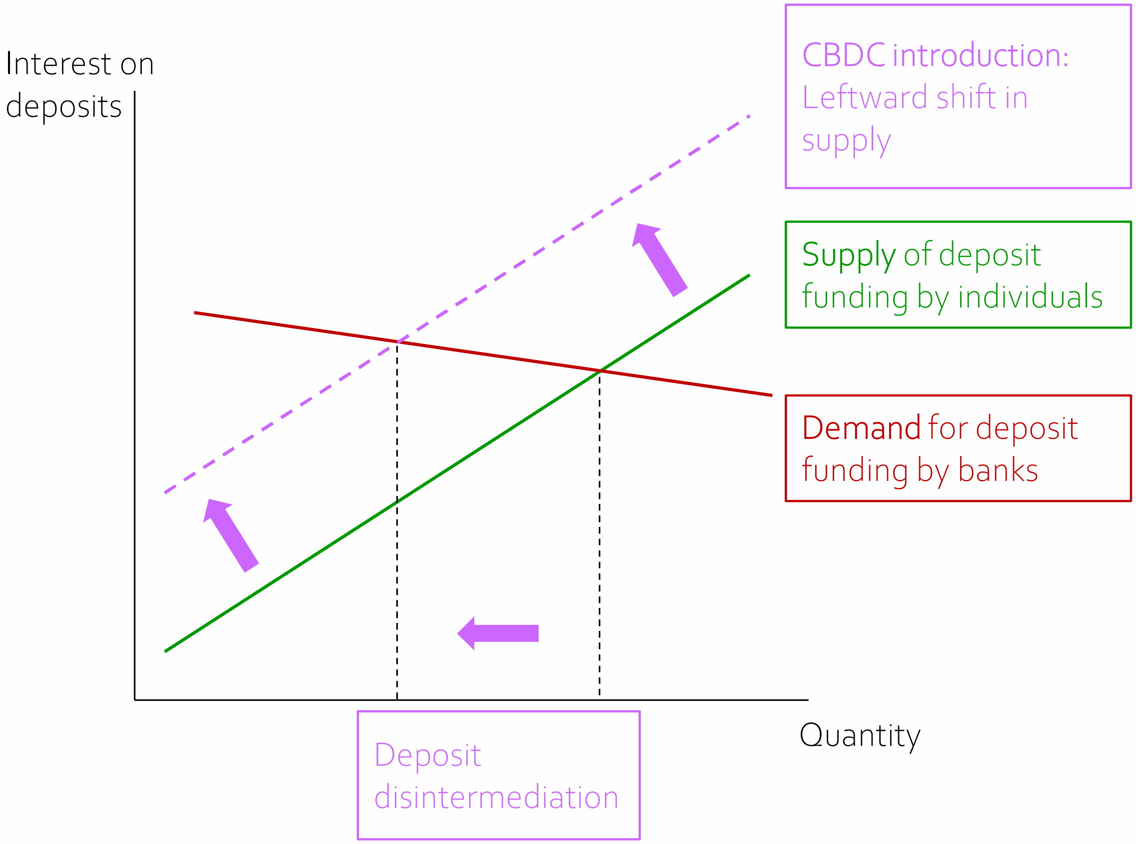
Scenario 2. Disintermediation in tranquil times.

Will digital money lead to a decrease in banks deposits?

2. Will CBDC disintermediate banks?

A. How large should we expect disintermediation to be?

In simple model: disintermediation can be large



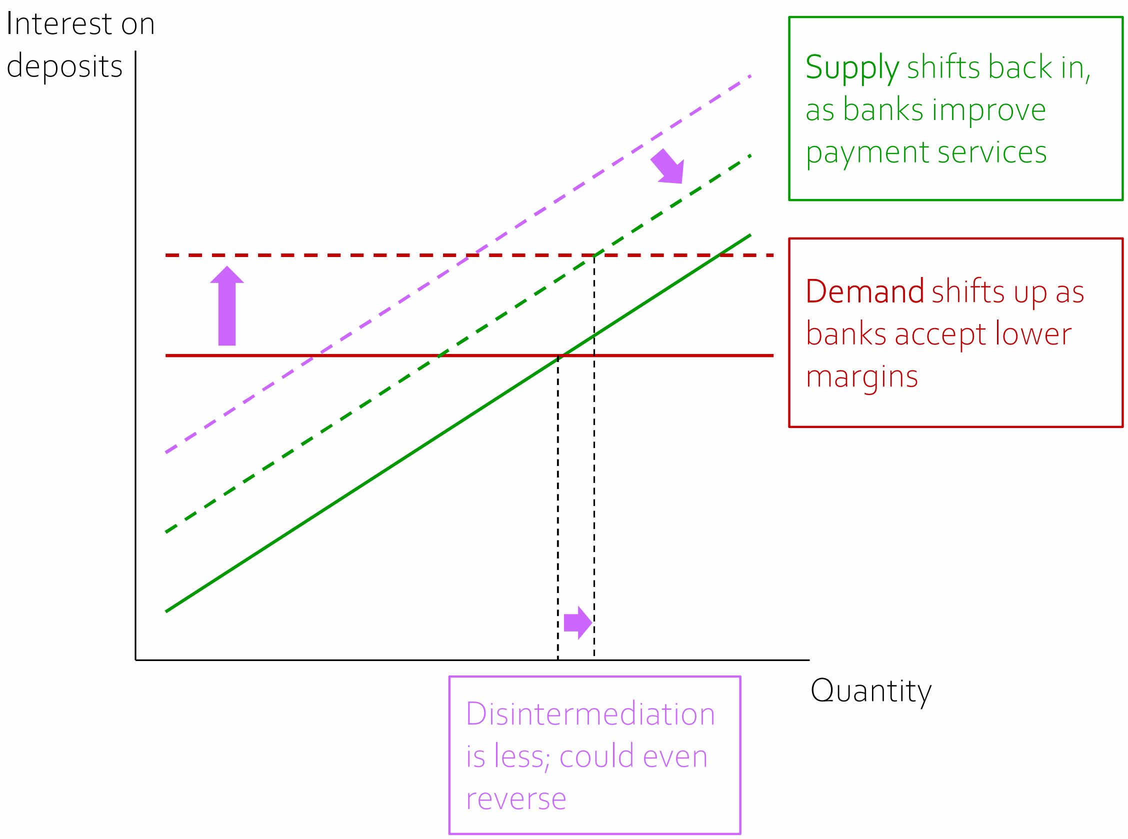
Baseline simulations*

	U.K.*	Portugal*
Change in deposit quantities	- 10%	- 0.1%
Change in deposit rates	+ 17 bps	+ 25 bps

- Effects larger if CBDC offers interest
- And if demand is flatter

(*) Simulations assume a liquidity value of (s)CBDC of 50 bps (possible lower bound to negative rates before deposits move to cash) and elasticity of deposit demand and supply to interest rate movements based on Chiu and Hill (2018) fot he U.K., and Canhoto (2004) for Portugal. Elasticities may vary depending on the level of interest rates.

As model gets richer, harder to get disintermediation



Many elements are missing from simple analysis...

1. Careful description and calibration of supply of deposit funding
2. Banks reaction:
   - Will they increase rates on deposits? Provide different services?
   - Competitive environment in deposits & credit markets
3. Role of regulation
4. Monetary policy

Let’s focus more on this

Results can change with a richer description (1/2)

Richer description for Households and banks (based on preliminary results of joint work with IMF colleagues)

A Baseline

Liquid assets | Illiquid assets

Households' holdings: Deposits | Cash | Bonds

B Introduction of CBDC: consider two cases

Case 1: "passive banks" Deposits | CBDC | Cash | Bonds

Case 2: "aggressive banks" Deposits | CBDC | Cash | Bonds

In model simulations, case 2 happens more often

Results can change with a richer description (2/2)

Why disintermediation less likely to happen?

- Banks have **strong incentives to keep customer base**: increase a lot deposits remuneration
- But: **profitability will decrease**

Under some carefully chosen calibration, **disintermediation can happen**. But:

- It seems overall **relatively small** (4.5% decline in deposits)

- It will have a **negligible impact on lending** if other sources of funding (wholesale, central bank) is available.

Ongoing work: more avenues still need to be explored. E.g:

- Role of competition among banks
- Remunerated CBDC

Other effects through banks must also be investigated

Regulatory	Mechanical Funding and liquidity ratios
Profitability	Impact on capital ratios
Margins & loan rates	Lending market Can monetary policy offset higher lending rates?
Production function	Access to data? Ability to compete on non-pecuniary dimensions?

Current wisdom for CBDC

Disintermediation **may not be large** (at least for short medium term)

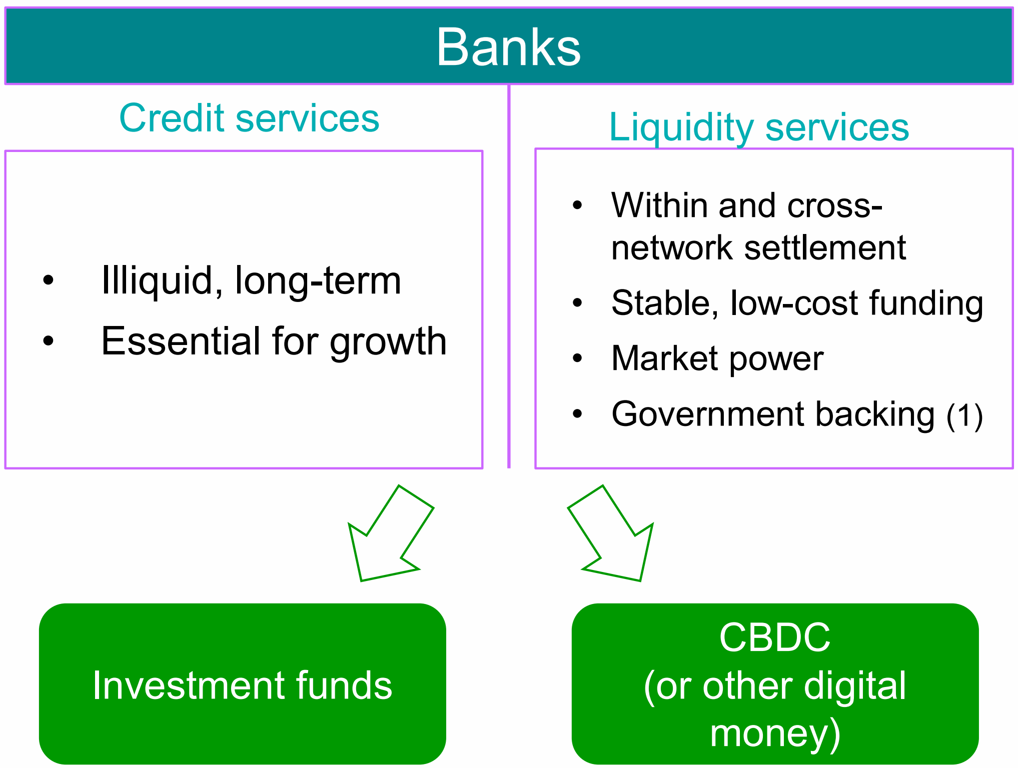
Safeguards can be introduced in CBDC design itself

- **Price limits**: CBDC bears (increasing) penalty rate beyond certain wallet size
  - For instance: 0% interest rate for holdings between 0 and $2000, -0.10% for holdings between $2000 and $4000, -0.30% for holdings between $4000 and $6000, etc..
- **Quantity limits**: wallets capped, and surplus is swept into bank accounts
  - Bahamas Sand Dollar: link CBDC account to a bank deposit account. Whenever holdings of CBDC exceeds a preset limit, additional holdings are automatically transfer to a bank deposits account.

How to calibrate limits?

Still more analysis is needed…

Longer term issue:
towards a new world of financial intermediation?



- Fractional vs. Narrow banking
- A long-debated issue among economists
- Not clear which one leads to more efficient outcomes in lending
- With lower maturity transformation, lower risk of bank-runs

(1) E.g. deposit insurance, LOLR, ELA, supervision

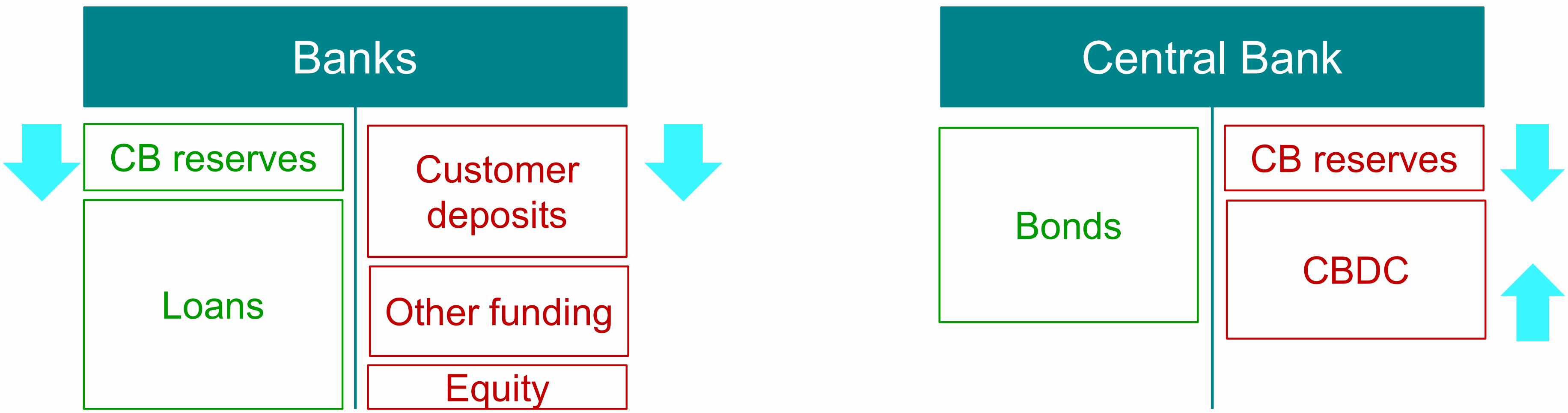
2. Will CBDC disintermediate banks?

B. What is the impact on aggregate liquidity?

A look at balance sheets

Previous considerations focused on the **liabilities side** of banks' balance sheets

What about the composition of the **assets side**?



Impact on aggregate liquidity?

Disintermediation will lead to a decrease of CB reserves in banks balance sheets.

Distinguish short vs longer term effects:

- **Short term**: if demand for CBDC will be large, diffused and immediate, banks will scramble for reserves ⟹ aggregate liquidity shortfall
- **Longer term**: Central Bank will need to provide reserves to banks, to compensate the shortfall and re-establish the equilibrium.

Some **preliminary** considerations:

- Reliable **estimates of CBDC demand** is key to estimate short term impact on aggregate liquidity
- **Speed** and **diffusion of demand** are important factors. If demand for CBDC is slow, and affect substantially only some banks, short term effects can be muted.
- Long term equilibrium could have **lower reserves in circulation**

But more factors need to be considered: role of **liquid assets requirements**?

Conclusions

- CBDC is likely to bring **both benefits and risks** to central banks ability to achieve **policy objectives**.
- State-of-the-art analyses points that **disintermediation might not be so large** (at the least in the medium term)
- But **richer models are warranted**, which consider household, banks, firms, central bank and regulation, together with potential safeguards in CBDC design.

Thank you!

- Staff Discussion Note: Virtual Currencies and Beyond: Initial Considerations, January 2016.
- Staff Discussion Note: Fintech and Financial Services: Initial Considerations, June 2017.
- Staff Discussion Note: Casting Light on Central Bank Digital Currencies, November 2018.
- Fintech Note: The Rise of Digital Money, July 2019.
- IMF Policy Paper: Digital Money Across Borders: Macro-Financial Implications, October 2020.
- IMF Policy Paper: The Rise of Digital Money – A Strategic Plan to Continue Delivering on the IMF's Mandate, July 2021