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
- Safety, resilience, market discipline
- Financial inclusion
- Efficiency of government services
- Catalyst for innovation
- Rights of citizens

#### Benefits of CBDC
- Cheap, reliable government alternative
- Payments to poor, isolated, unbanked, non-economically viable
- Lower costs of cash management
- Direct transfers
- Programmable money
- PvP, DvP with tokenized assets
- Widely available sovereign-backed money

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1. **What is CBDC?**
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…

1. What is CBDC?
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

CBDC introduction:
Leftward shift in supply

Supply of deposit funding by individuals

Demand for deposit funding by banks

Baseline simulations*

<table>
<thead>
<tr>
<th></th>
<th>U.K.*</th>
<th>Portugal*</th>
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</thead>
<tbody>
<tr>
<td>Change in deposit quantities</td>
<td>- 10%</td>
<td>- 0.1%</td>
</tr>
<tr>
<td>Change in deposit rates</td>
<td>+ 17 bps</td>
<td>+ 25 bps</td>
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</table>

• 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) for the 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

Disintermediation is less; could even reverse

Supply shifts back in, as banks improve payment services

Demand shifts up as banks accept lower margins
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

Households’ holdings:
- Liquid assets: Deposits, Cash
- Illiquid assets: 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?

**2.A Will CBDC disintermediate banks?**
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?**

### Banks

<table>
<thead>
<tr>
<th>Credit services</th>
<th>Liquidity services</th>
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</table>
| • Illiquid, long-term  
• Essential for growth | • Within and cross-network settlement  
• Stable, low-cost funding  
• Market power  
• Government backing (1) |

- 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

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

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**2.A Will CBDC disintermediate banks?**
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**?

**Banks**
- CB reserves
- Loans
- Customer deposits
- Other funding
- Equity

**Central Bank**
- CB reserves
- Bonds
- CBDC

**2.B What is CBDC impact on banks’ liquidity?**
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**?

2.B What is CBDC impact on aggregate liquidity?
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.