Central bank digital currency is evolution, not revolution – also across borders

Morten Bech
Swissquote Conference 2020 on Finance and Technology, EFPL, 30 October 2020

The views in this presentation are those of the presenter and not necessarily those of the BIS
“History doesn’t repeat itself, but it often rhymes”

– Mark Twain
CBDCs are hot stuff

CBDCs: the next hype or the future of payments?

Graph 1

Timing of speeches and reports on CBDC

Google search interest over time

1 12-month moving sum of the count of central bankers’ speeches resulting from a case-insensitive search for any of the following words/phrases: CBDC; central bank digital currency; digital currency and digital money.  
2 12-week moving average of worldwide search interest. The data has been normalised to the 12-week moving average peak of each series. The search was run on search terms “Bitcoin” and “Facebook Libra” and topic “Central Bank Digital Currency”. Data accessed on 16 July 2020.

Key features of a retail CBDC

- State issued
- Singleness of currency
- Ease of use
- Scalable
- Fast
- Legal framework
- High availability
- Cross border
- Offline

= target or aspiration
Game plan

- A simple view of payment systems
  - Front-end, **network** and back-end
- Innovation and payment systems
  - Network is key
- Postal giro system
  - History and a bit of economics
- CBDC v Postal giro
Payment system = front-end, network and back-end
A simple example to fix ideas

Real time gross settlement system

Bank A → Network → Central bank RTGS → Network → Bank B
Unpacking the back-end: *Gold transfers between central banks*

**Settlement asset**

Central bank A → Network → Federal Reserve Bank of New York → Network → Central Bank B

**Transfer mechanism**

Settlement agent: frbnytours@ny.frb.org
Innovations and payment systems
Innovation in payment systems can happen in one (or more) of three places:

- Front-end
- Network
- Back-end
Recent innovations to the front end: *Bank to bank transfers*
Innovations to the back-end are rare (*I think*):

- 1494, Luca Pacioli
- 1907, IBM Tabulator Punch card
- 1970, Fedwire goes electronic
- 2008, Bitcoin
Improvements in “network” technology have always made payments faster
In the beginning God created the heaven, the earth and the internet

- What was the largest communications network before the internet?
In the beginning God created the heaven, the earth and the internet

- What was the largest communications network before the internet?
A mail based payment system?

Postal Giro (credit transfer system)
Postal banking system

Postal Savings Bank

Great Britain first nation to offer such an arrangement. Cheap way to finance government and financial inclusion. Min deposit one shilling (12p) to open account – below that saving stamps. Max deposit £30 per year and £150 max balance.
Postal giro system

Austria (Habsburg Empire)

Emperor Franz Josef inaugurates Post Office Savings Bank based on the “English Model”. The Bank director Dr Georg Coch introduces credit transfer (giro) system to minimize demand for coinage.
The diffusion of giro systems

Postal giro systems are spreading

Algeria, Austria, Belgium, Denmark, France (Monaco), Germany, Holland, Italy (San Marion, Vatican), Japan, Luxembourg, Morocco, Sweden and Switzerland (Liechtenstein)
The Money Flower

Widely accessible

Electronic

Central bank - State issued

Peer to peer

Bech and Garratt (2017)
Run risk and postal saving banks

1930s

Great depression

During the Great Depression of the 1930s postal savings account deposits in the United States rose to $1.2 billion, a nearly eight-fold increase over the $153 million on deposit in 1929.

Golden age

1960-70s

Postal giro systems

UK: 1968
Iceland: 1971
Big steps in terms of automation to deal with volumes.
Bank-owned giro network set up in some countries
The source

- UK study of giro systems abroad
- Published 1964
- Includes detailed analysis of the
  - bank transfers in the UK
  - giro transfers Sweden
    - Giro more efficient
- UK implemented a giro system in 1968
Giro transfers by country - 1962

- Austria
- Belgium
- Finland
- France
- West Germany
- Holland
- Sweden
- Switzerland

Transactions/day '000

Daily transaction per 1000 citizens (right axis)
Facts about the Swedish Post Giro system **1962**

- 462K accounts – Pop 7.5m (4.5m working age)
  - 62 (102) per 1000
- Free account to account transfers
- 258m transactions => 560 transactions per accounts
- Value transferred 480B SEK ~ 5 x GDP
- Account balances 2.8B SEK, Avg 6000 SEK ~ 92000 SEK today ~ 9000 EUR

**Accounts**
- Interest income: 125m SEK (4.4% RoI)
- Fees: 33m
- Costs: **150m**
- Profit: 8m
Swedish international giro network in 1962

- Free transfer to other Nordic countries
- Direct connections 10.2 m account holders
- 317k transactions
- £32m value ~ £600m today
- £100 average ~ £2000 today
- Foreign account holders allowed eg
  - West Germany: 203
  - USA*: 60
  - Finland: 53
  - UK*: 30

* Did not have own postal giro system
Global giro network

The use of this map does not constitute, and should not be construed as constituting, an expression of a position by the BIS regarding the legal status of, or sovereignty of any territory or its authorities, to the delimitation of international frontiers and boundaries and/or to the name and designation of any territory, city or area.

What made the international payments possible?

- Standards and a multilateral clearing mechanism by a small institution in Switzerland
  - Nobody knows it
  - It is located in a city that begins with a "B"
What made the international payments possible?

- Standards and a multilateral clearing mechanism by a small institution in Switzerland
  - Nobody knows it
  - It is located in Bern
The liberalization wave of the last decades of the 20th century affected the postal giro systems. In many countries postal banks and giro systems were privatized. Still exists but varying degree of state backing.
# Key features of a retail CBDC

<table>
<thead>
<tr>
<th>Feature</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>State issued</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>1:1 Singleness of currency</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Ease of use</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Scalable</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Fast</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Legal framework</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Scalable</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Fast</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Legal framework</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>High availability</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Cross border</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Offline</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
“HISTORY REPEATS ITSELF, FIRST AS TRAGEDY, SECOND AS FARCE.”

KARL MARX

© Lifehack Quotes
Extra slides
Sometimes some of or all the elements are one: *Cash and bitcoin*
Multiple front-ends, networks, and back-ends: *Home Banking*

- **Payer front-end** → Network → **Payer’s bank** → Network → **Payee front-end**

  - **Same bank**
  - **Different bank**

- **Home Banking**