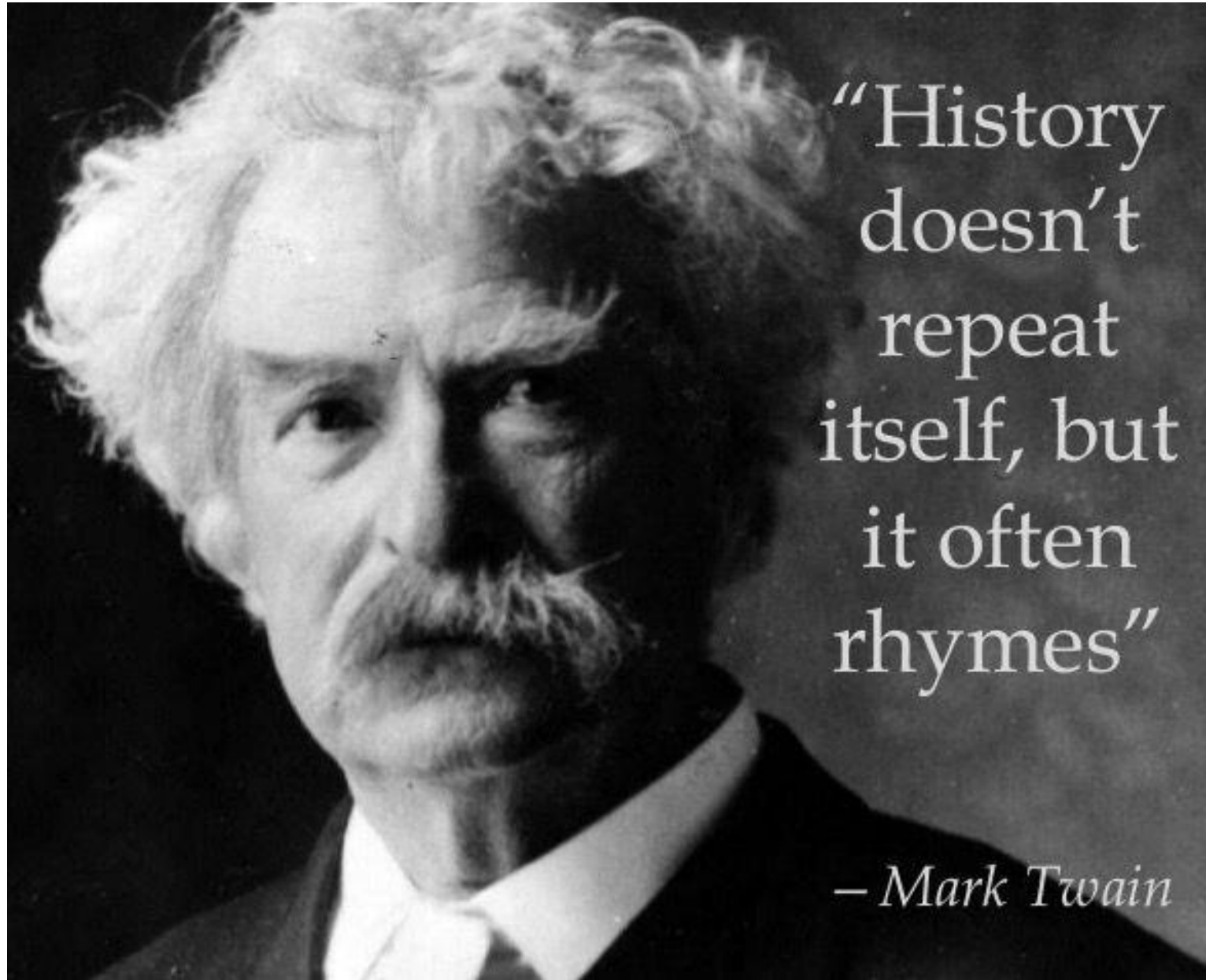




# Central bank digital currency is evolution, not revolution – also across borders

Morten Bech

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



“History  
doesn’t  
repeat  
itself, but  
it often  
rhymes”

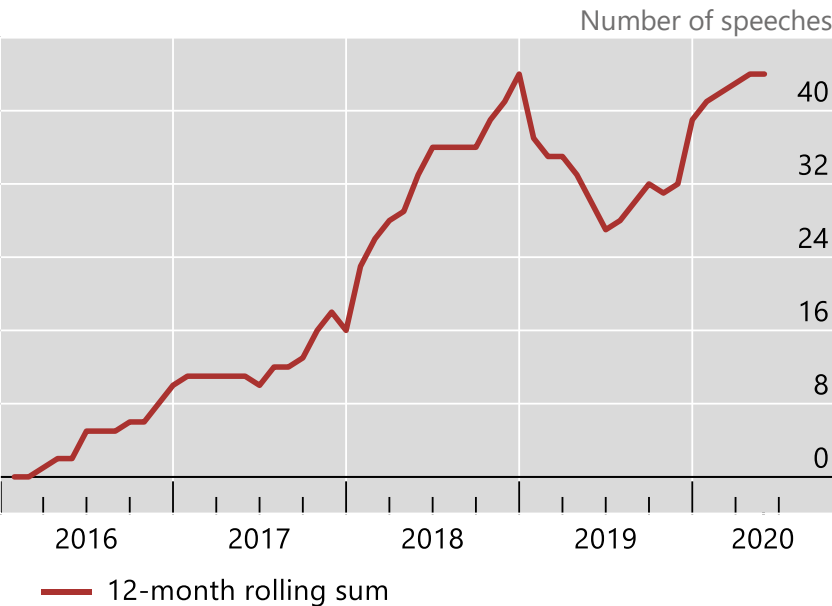
– *Mark Twain*

# CBDCs are hot stuff

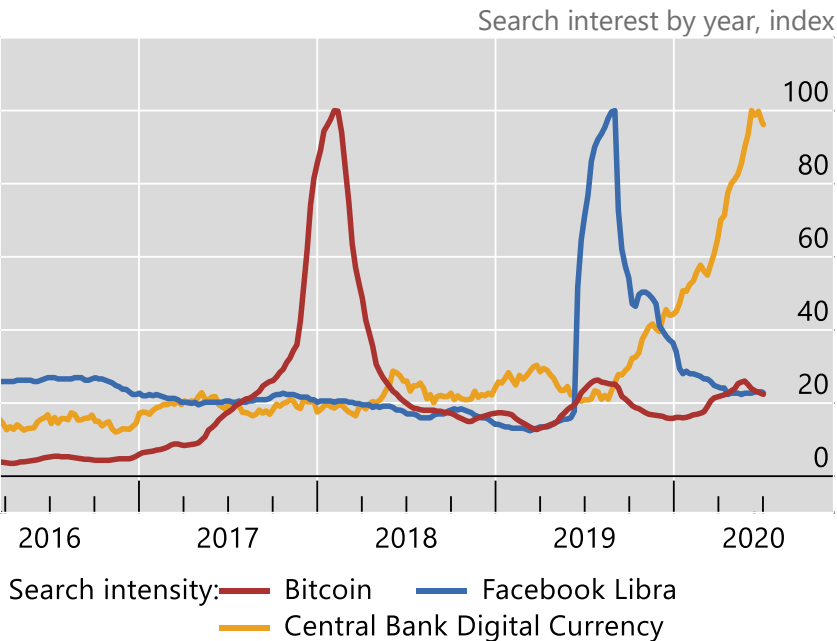
CBDCs: the next hype or the future of payments?

Graph 1

Timing of speeches and reports on CBDC<sup>1</sup>




Google search interest over time<sup>2</sup>

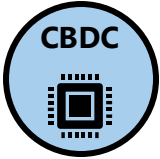
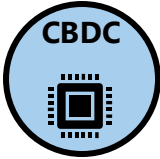
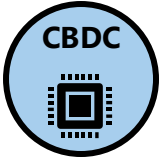




















<sup>1</sup> 12-month moving sum of the count of central bankers' speeches resulting from a case-insensitive search for any of the following words/phrases: CBDC; central bank digital currency; digital currency and digital money. <sup>2</sup> 12-week moving average of worldwide search interest. The data 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.

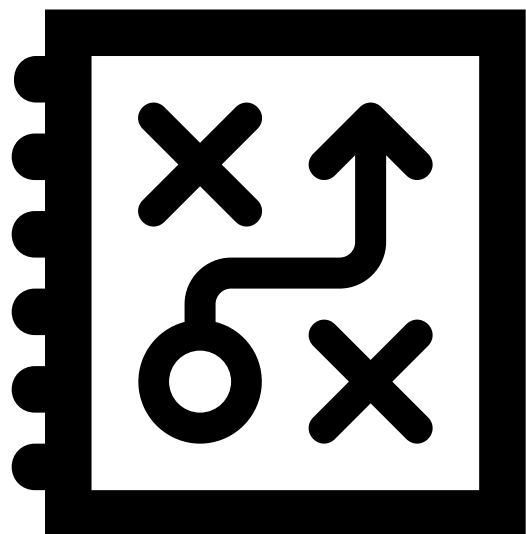
Sources: R Auer, G Cornelli and J Frost, "Rise of the central bank digital currencies: drivers, approaches and technologies", *BIS Working Papers*, no 880, August 2020.

# Key features of a retail CBDC

 = target or aspiration

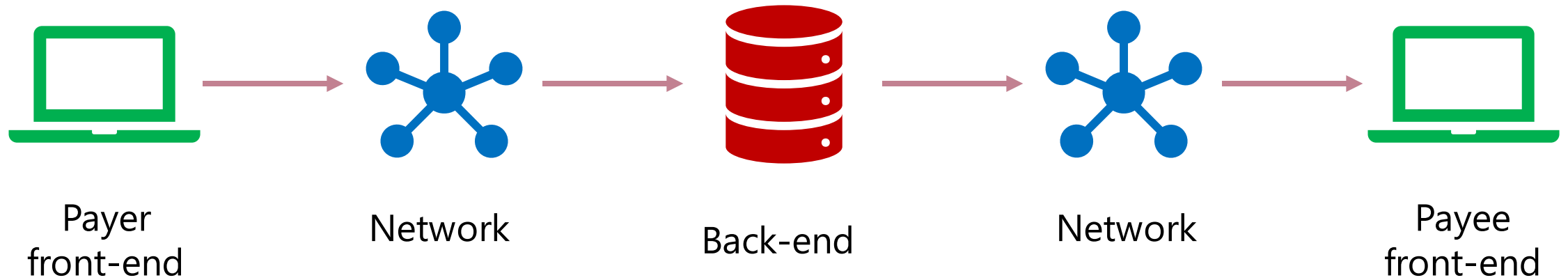
			
 State issued			
			
			
			
			
			
Singleness of currency			
			
			
			
			
Ease of use			
			
			
			

# Game plan



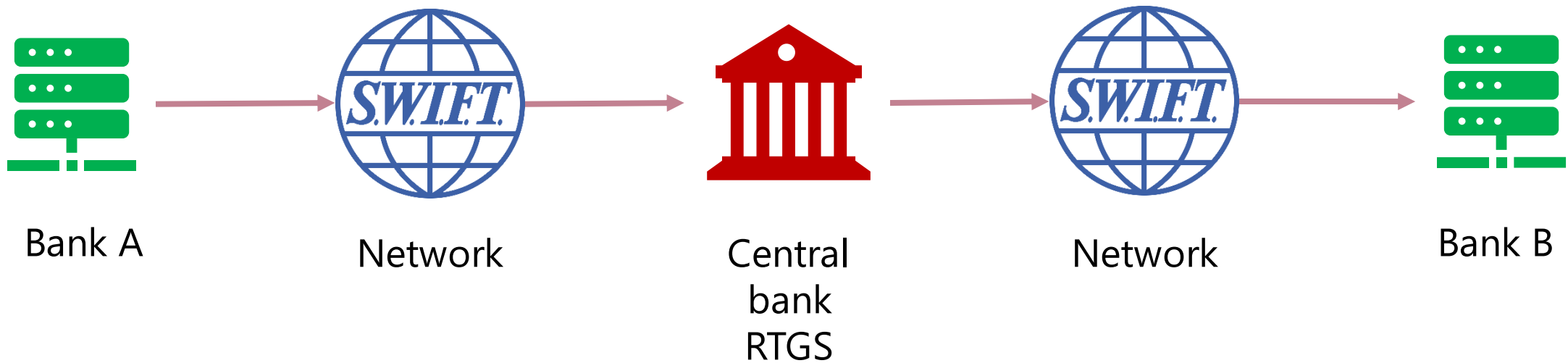
- A simple view of payment systems
  - Front-end, **network** and back-end
- Innovation and payment systems
  - Network is key
- Postal giro system
  - History and a bit of economics
- CBDC v Postal giro

Payment system = front-end, network and back-end

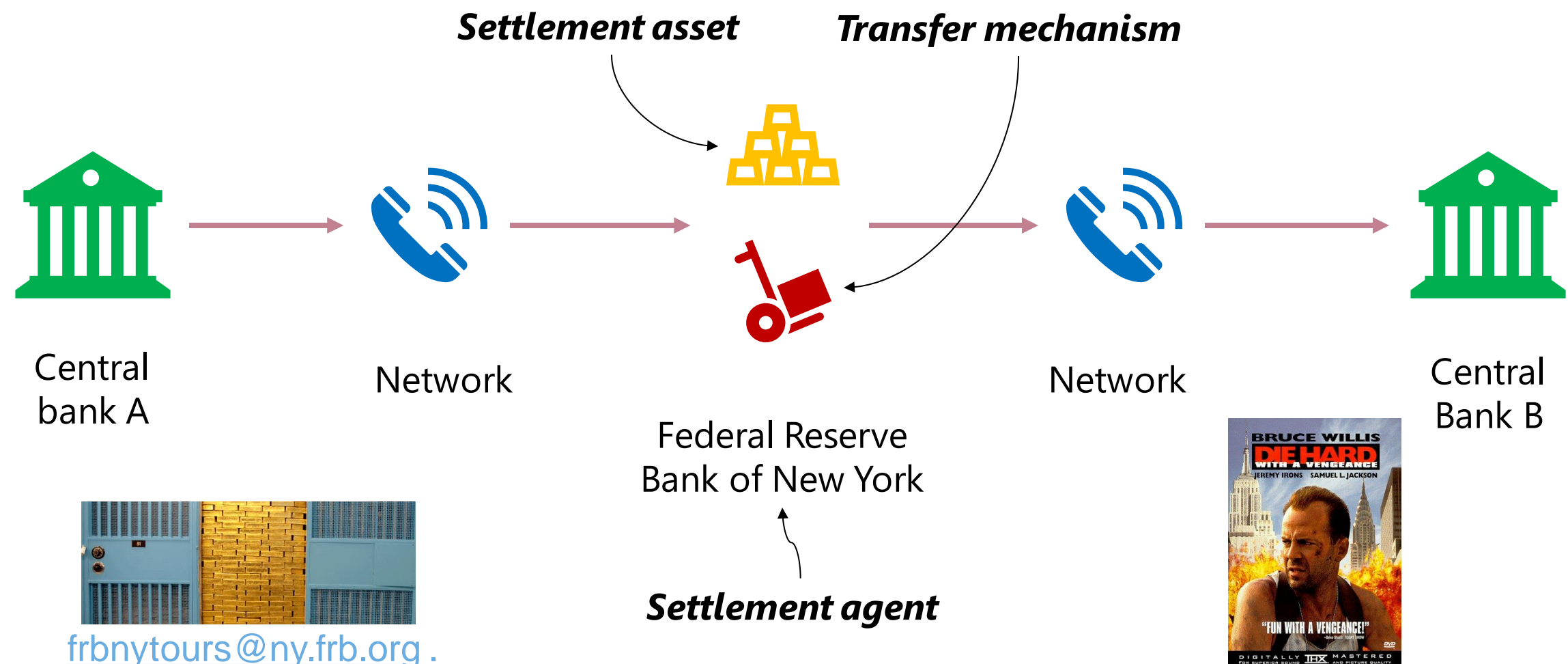


## A simple example to fix ideas

### *Real time gross settlement system*

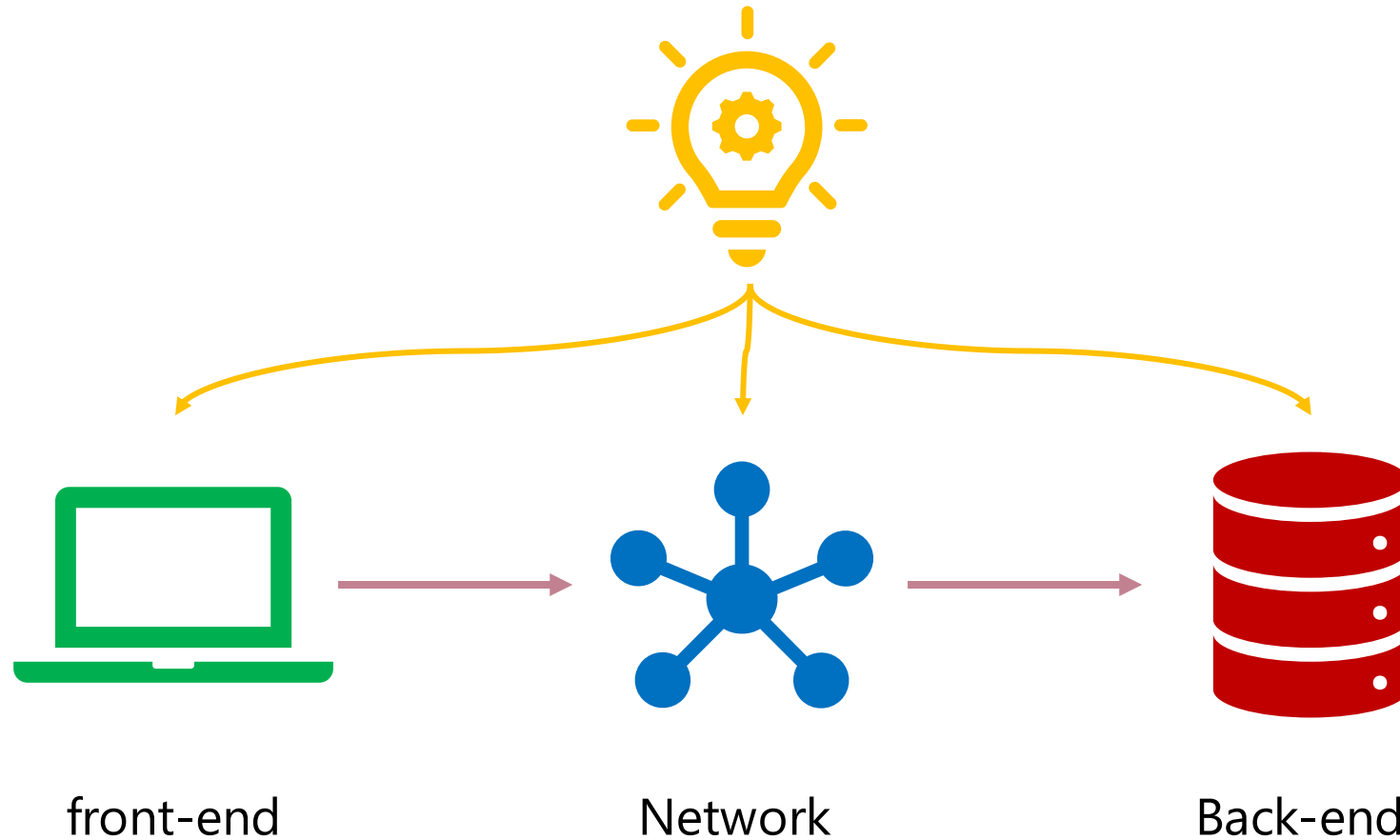


# Unpacking the back-end: *Gold transfers between central banks*

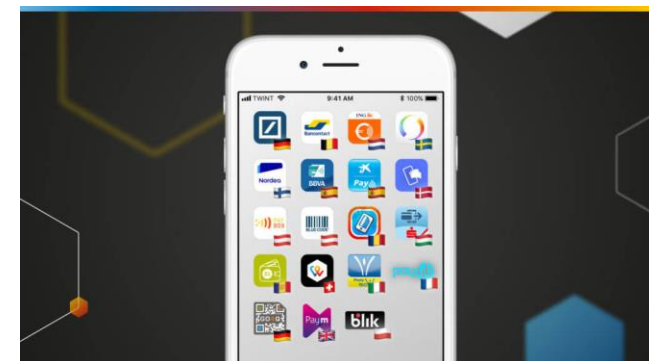
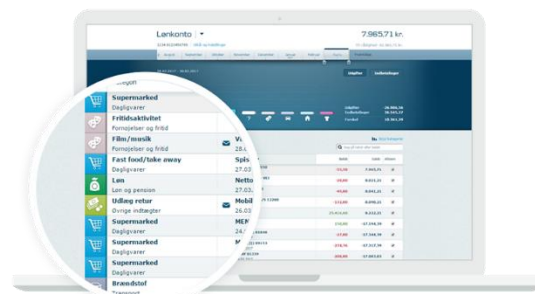


## Innovations and payment systems

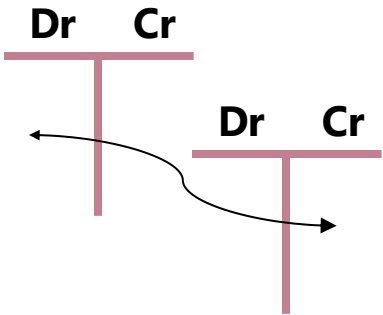
Innovation in payment systems can happen in one (or more) of three places



# Recent innovations to the front end: *Bank to bank transfers*

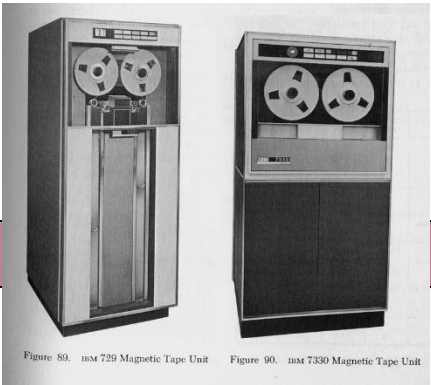


Innovations to the back-end are rare (*I think*):



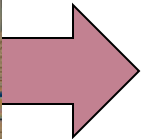
1494, Luca Pacioli

1907, IBM Tabulator  
Punch card

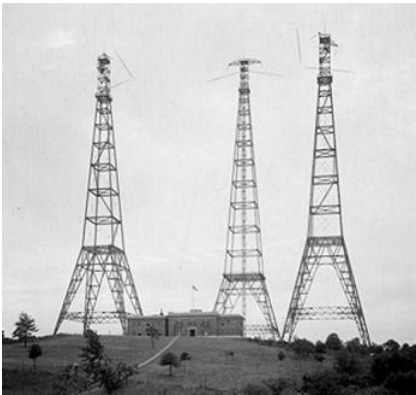
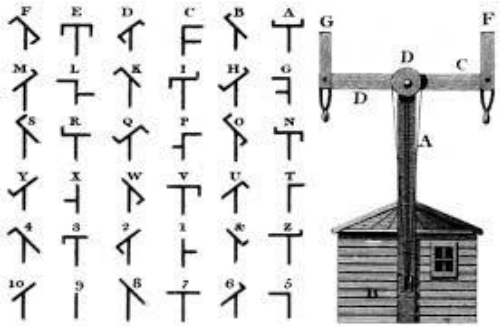
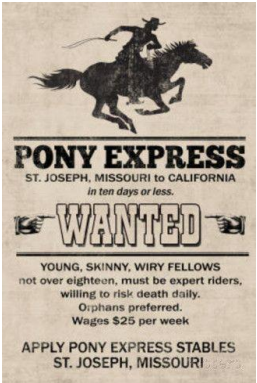


1970, Fedwire goes  
electronic

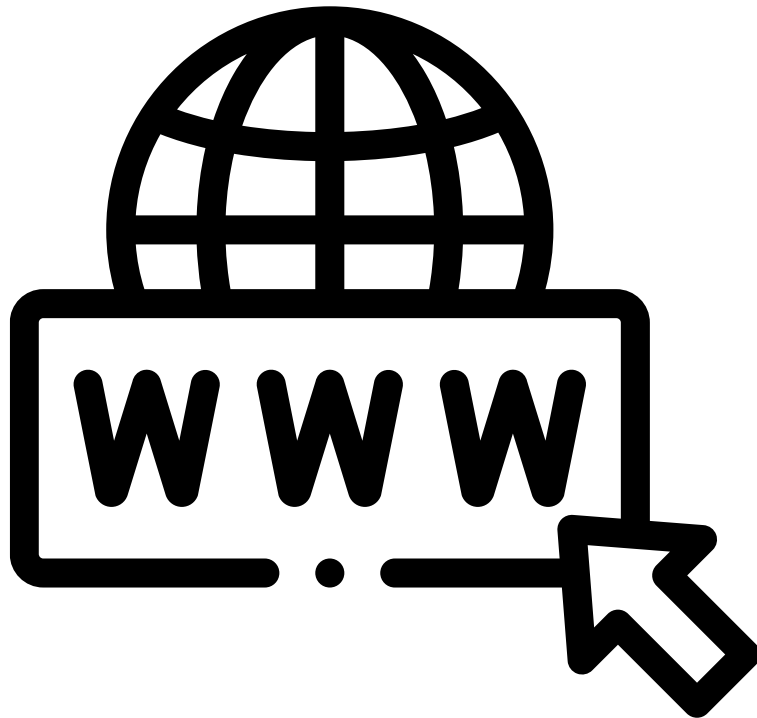
2008, Bitcoin



# Improvements in “network” technology have always made payments faster

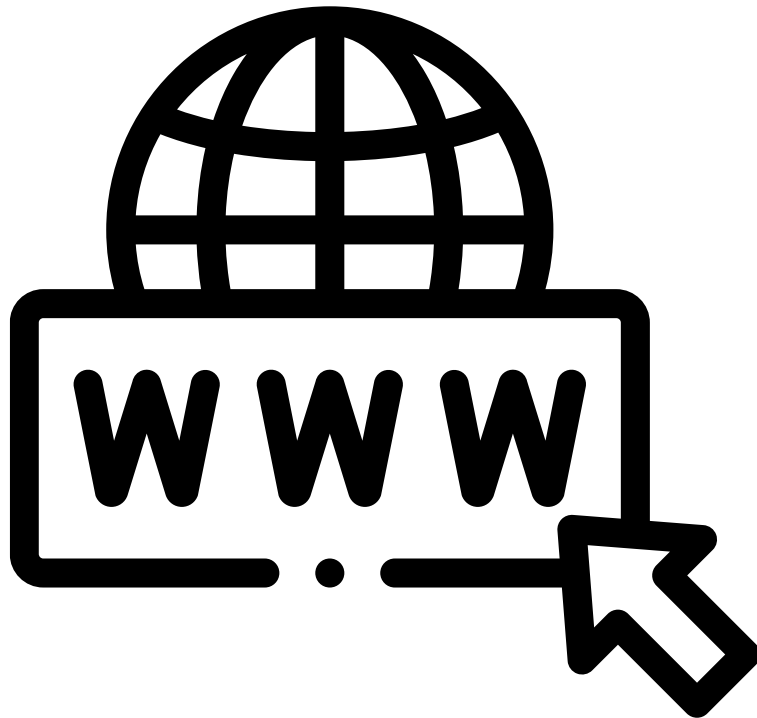


In the beginning God created the heaven, the earth and the internet

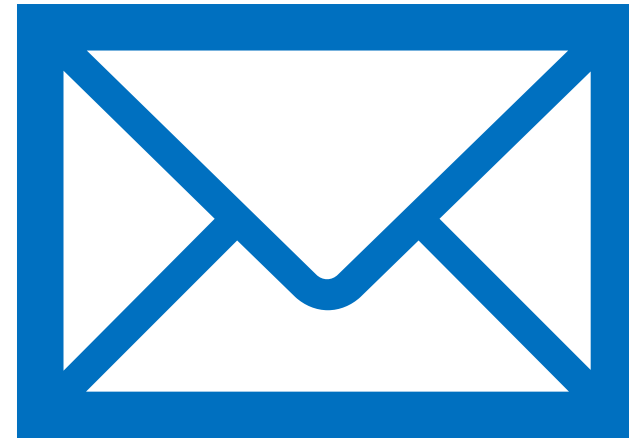


- What was the largest communications network before the internet?

In the beginning God created the heaven, the earth and the internet



- What was the largest communications network before the internet?

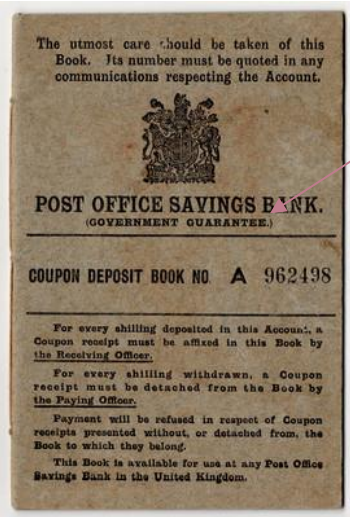


# A mail based payment system?

## *Postal Giro (credit transfer system)*



# Postal banking system

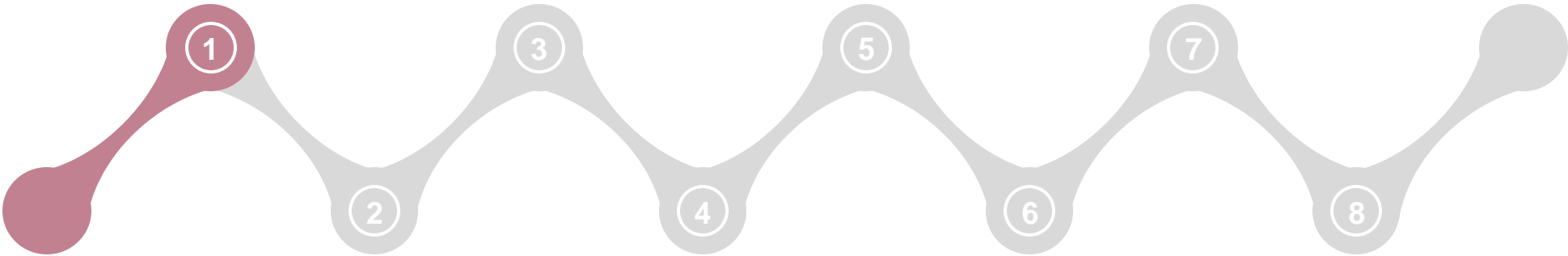


1861

Government Guarantee

## 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.



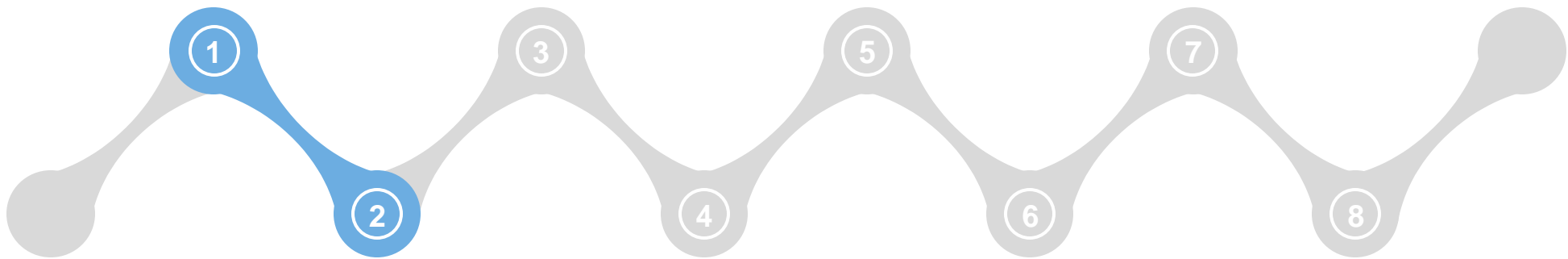
# Postal giro system



1883

## 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.



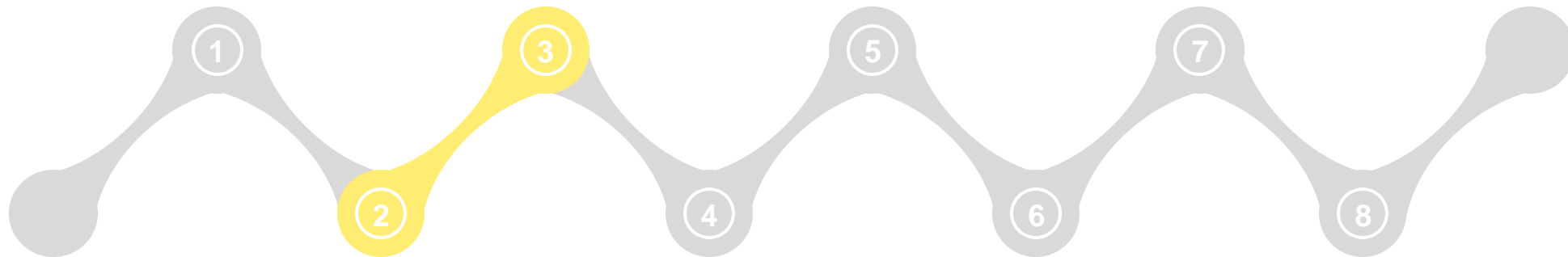
# The diffusion of giro systems



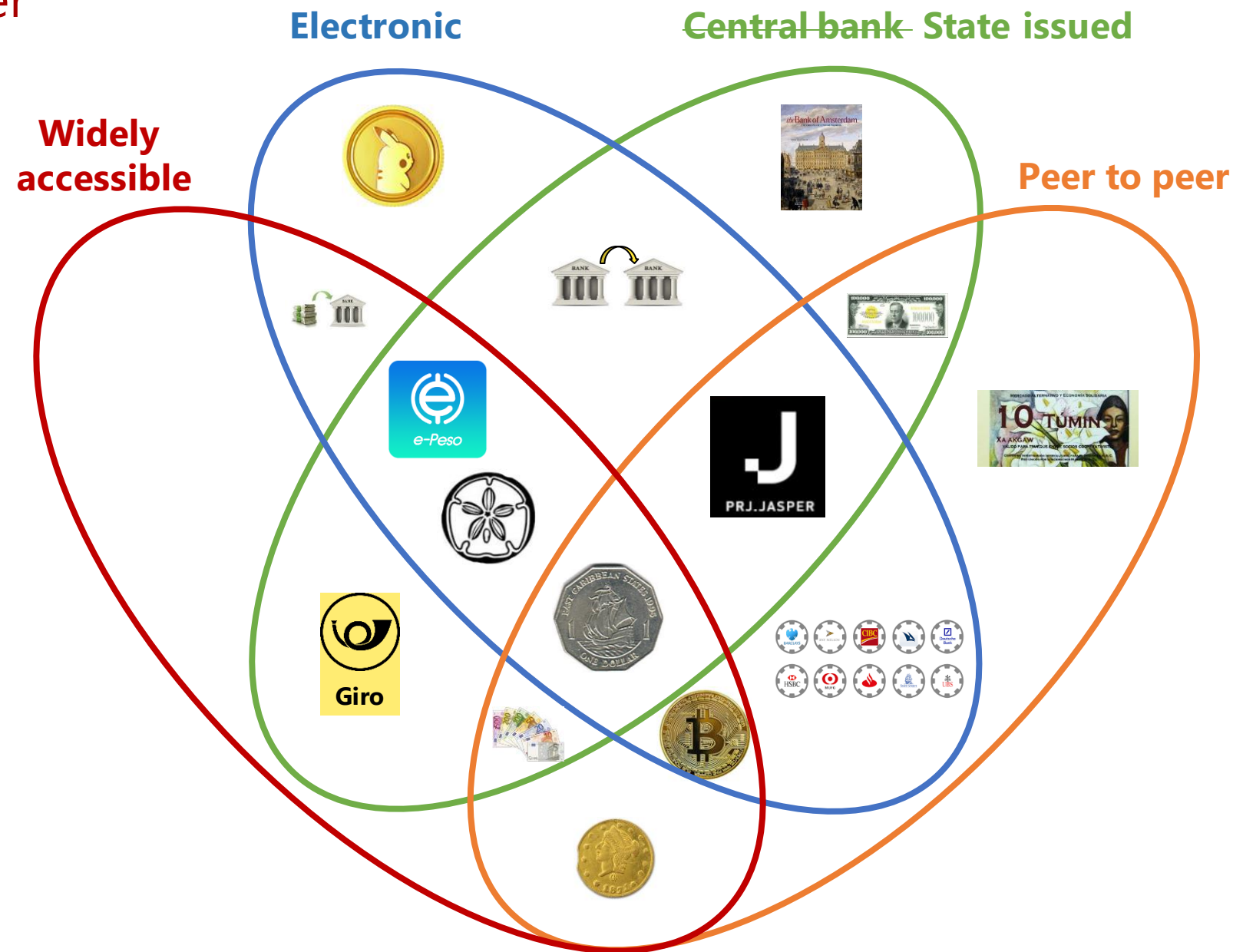
1925

## Postal giro systems are spreading

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

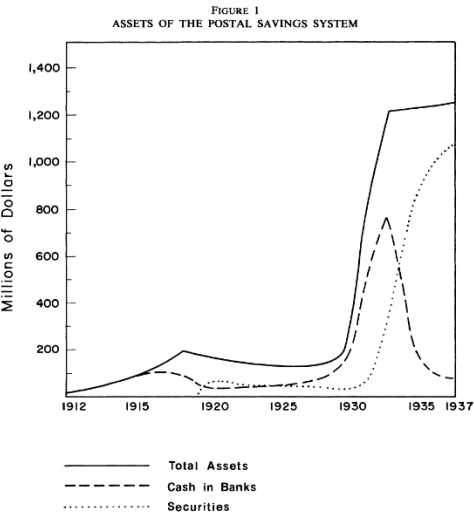


# The Money Flower



Bech and Garratt (2017)

# Run risk and postal saving banks



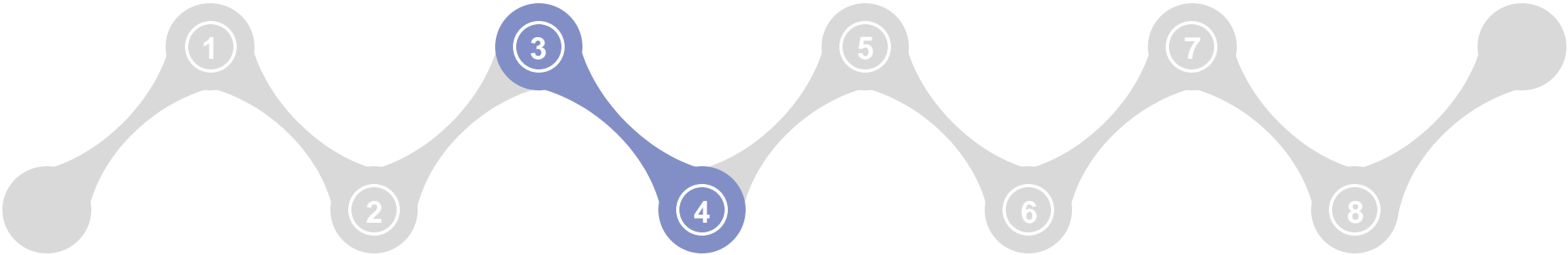
Source: Postmaster General, *Report of the Postmaster General* (Washington, D.C., 1940), p. 107.

## 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.



O'Hara M and D Easley (1979), "The postal savings system in the depression" *Journal of Economic History* Sep Vol 39 No 3 pp 741-53

# Golden age



## 1960-70s

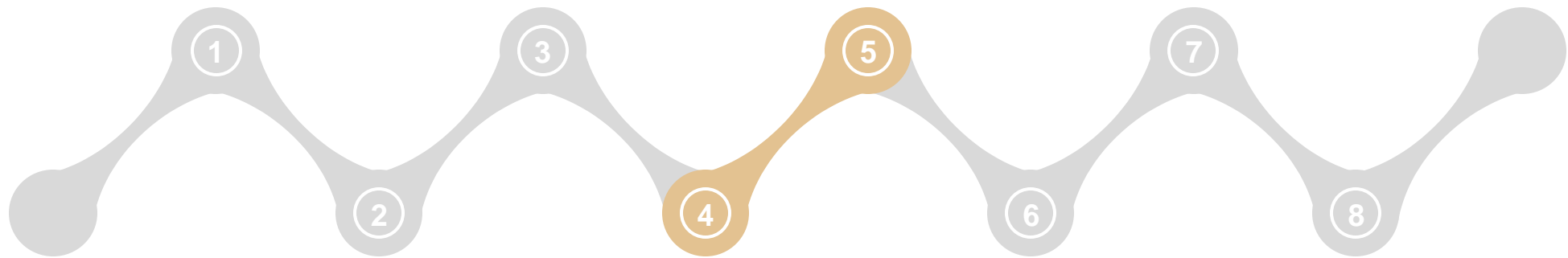
### Postal giro systems

UK: 1968

Iceland: 1971

Big steps in terms of automation to deal with volumes.

Bank-owned giro network set up in some countries

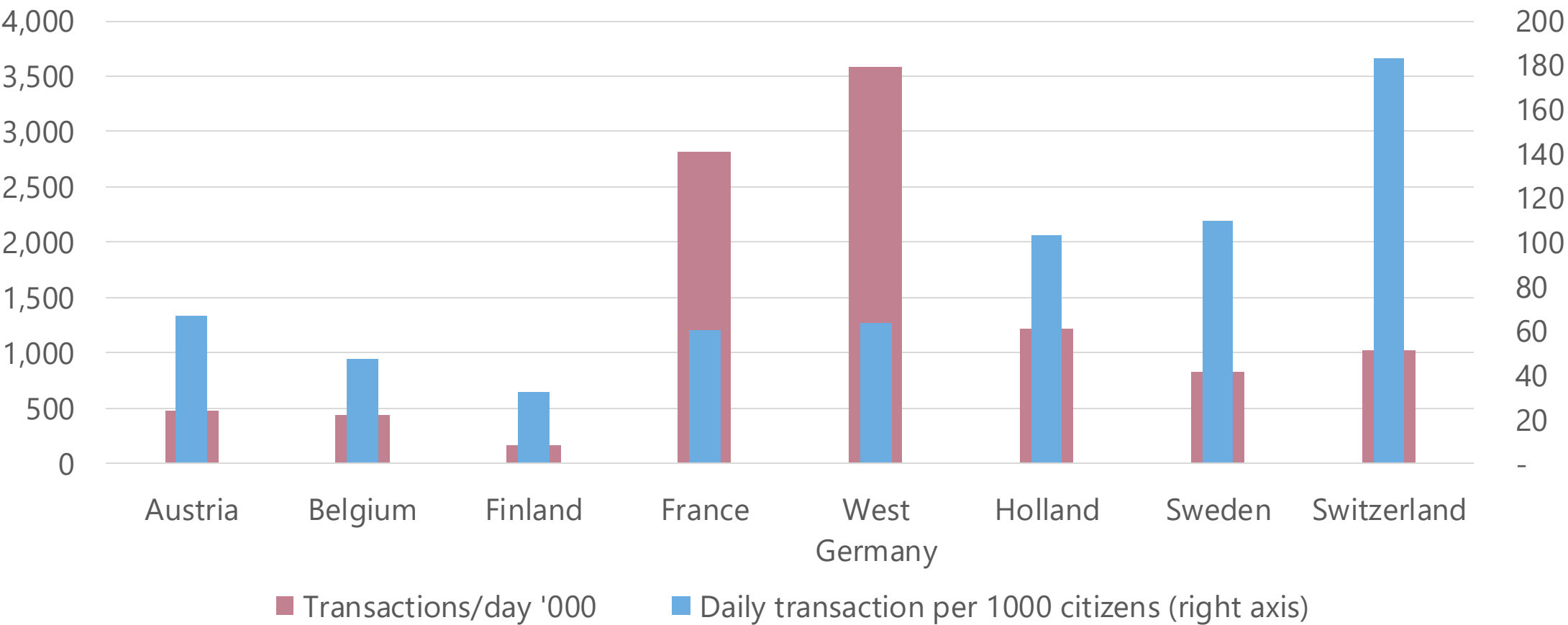


# The source

- 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

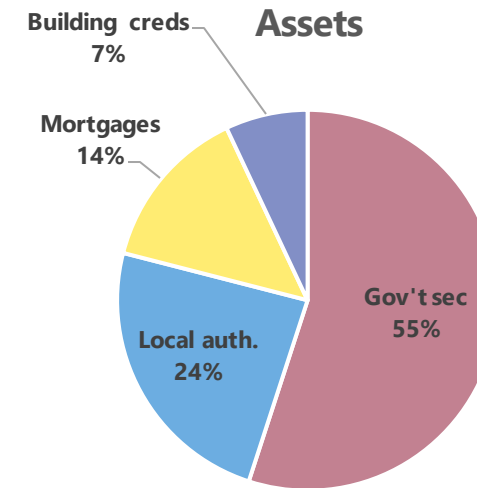


# Giro transfers by country - 1962



# 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

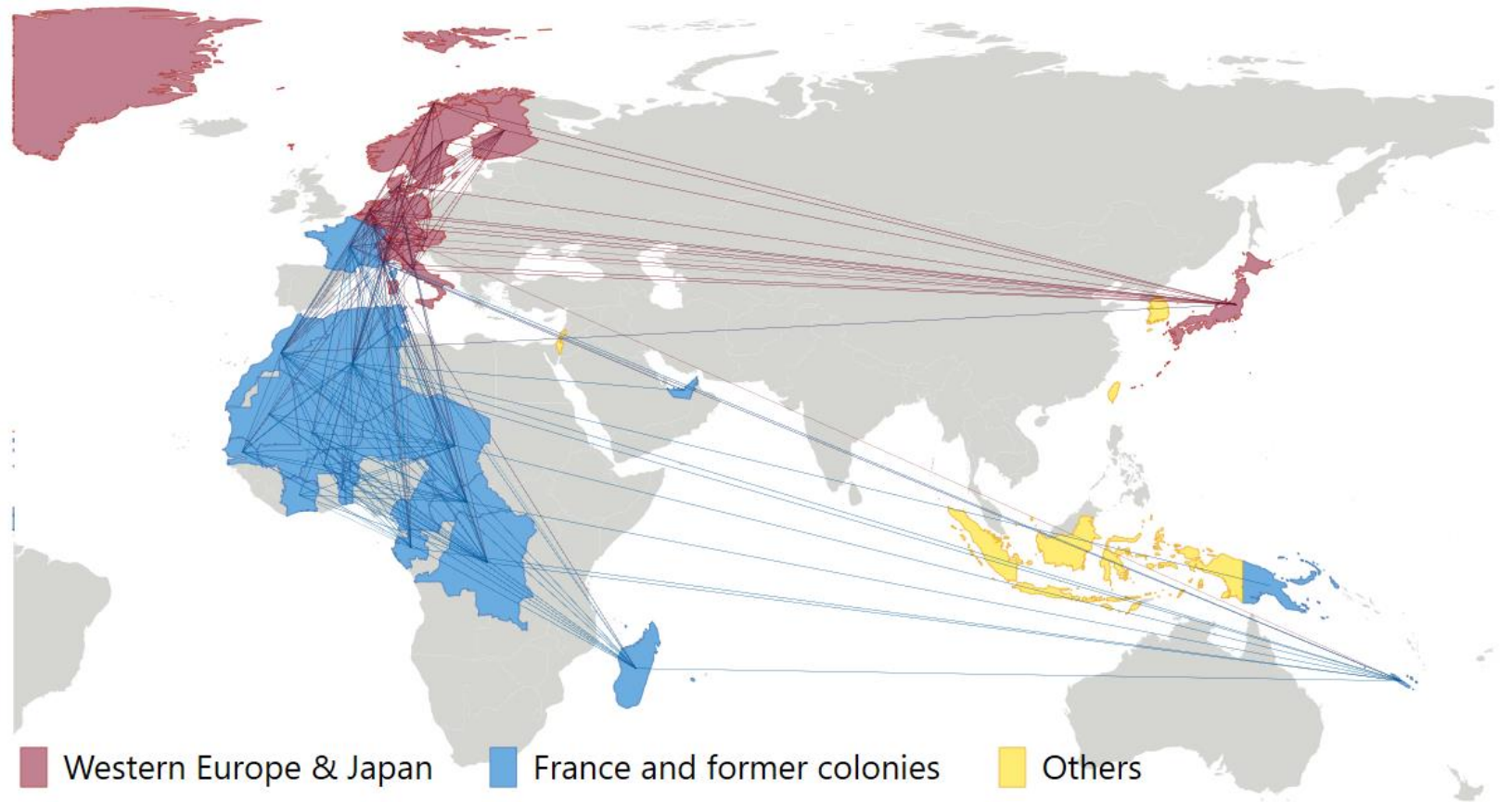
\* Did not have own postal giro system



# Global giro network

Global giro network

Graph X



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.

Sources: F P Thomson, "Giro credit transfer systems: popular international facilities for economic efficiency", Pergamon Press Ltd, London, 1964; author's elaboration.

# 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 with 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**



# Liberalisation



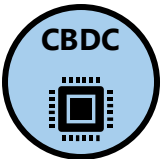

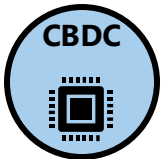

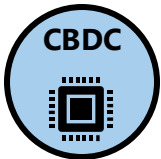










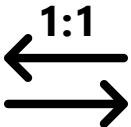





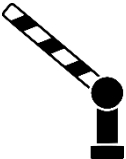











## 1980-90s

### Privatization

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

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

A black and white portrait of Karl Marx, showing him from the chest up. He has a long, white beard and is wearing a dark suit jacket over a white shirt. The background is dark and textured.

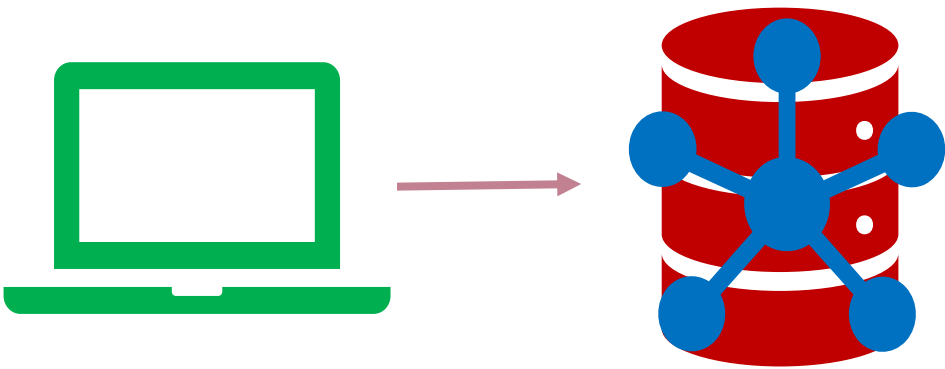
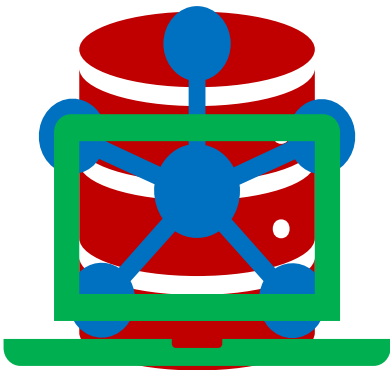
**“HISTORY REPEATS ITSELF, FIRST AS TRAGEDY,  
SECOND AS FARCE.”**

**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*

