

# Digital Cash

What it is and how it works

Lars Hupel  
GOTO Amsterdam  
2023-06-28

# Who uses card payments the most?

Lithuania 440.4

Luxembourg 409.9

Denmark 392.6

**“In a modern economy,  
being able to pay digitally  
is a basic need for  
people.”**

**Fabio Panetta**





**More than 13 million adults in  
the EU face financial exclusion**



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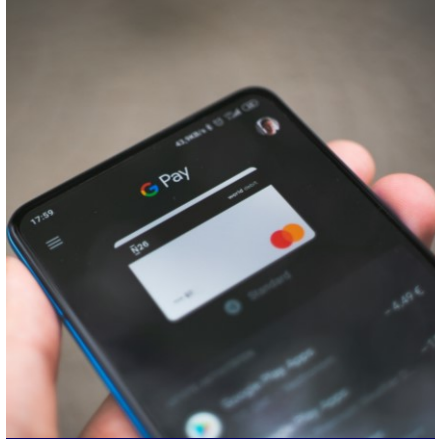


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# Types of money



Cash



Deposits/E-Money



Cryptocurrencies

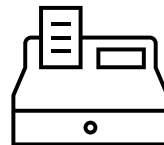


# Basic functions of money



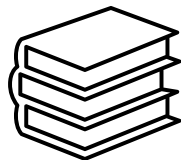
Legal tender

"Can I pay my taxes?"



Means of payment

"Can I pay at a shop?"



Unit of account

"How much  
does this cost?"



Store of value

"Would I use it for  
my pension?"

A close-up photograph of four hands of different skin tones (light, medium, and dark brown) stacked together in a circle, symbolizing unity and collaboration. The hands are positioned with fingers pointing towards the center, creating a sense of shared strength and support.

**Can we combine all advantages?**



# Central Bank Digital Currency

Issued by the  
central bank



Banknotes



CBDC



Deposits

Digital money

**In 2023, over 20  
countries will  
take significant  
steps towards  
piloting a CBDC.**





# What do users want?



# LEAK: EU Commission wants digital euro accessible to everyone

By J

**Policy**

15, 2023

## EU Legislation for Digital Euro Is Put on Hold: Source

A bill covering privacy and distribution of the central bank digital currency, originally scheduled for June 28, will be delayed

By Jack Schickler ⌚ Jun 19, 2023 at 3:45 p.m.

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## A digital euro takes shape even as political and technical challenges lie ahead

version of the currency that would be issued by the ECB, but  
and govern such a currency is unclear

**Policy**

## EU Commission's Digital Euro Bill Back on Track for June 28, Lead Official Says

The controversial central bank digital currency proposals had been removed from the EU executive's agenda.

By Jack Schickler ⌚ Jun 20, 2023 at 7:47 p.m. Updated Jun 20, 2023 at 8:39 p.m.



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**“Currency cannot be  
private, money is a public  
good of sovereignty”**

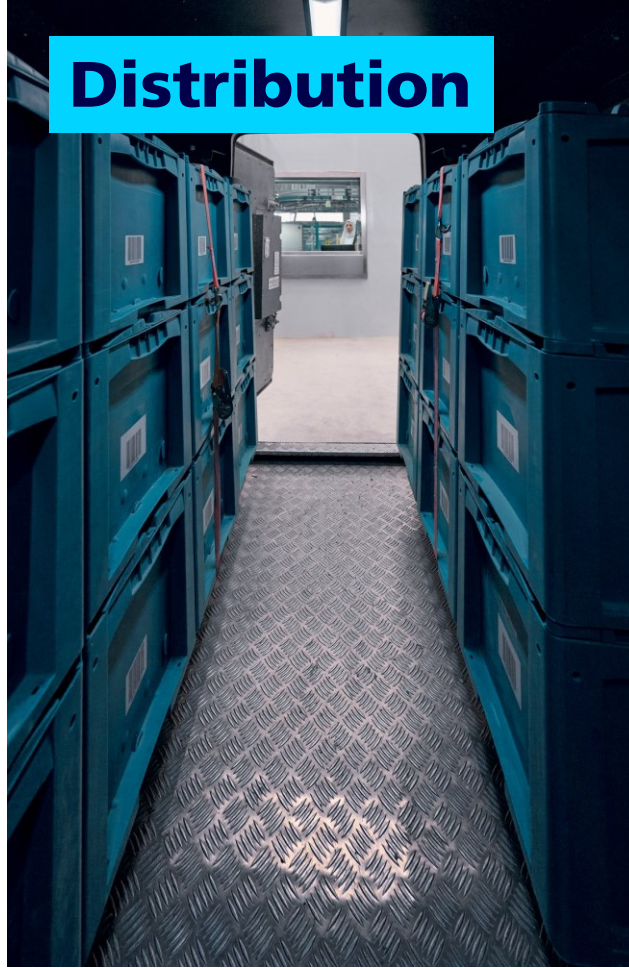
**François Villeroy de Galhau**



## Creation



## Distribution



## Usage







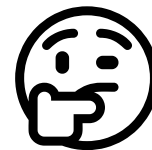
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- 1 ECB will not deal with users directly
- 2 Digital Euro will not be programmable
- 3 Legal tender without interest
- 4 Payments can be conducted offline

**offline-capable**



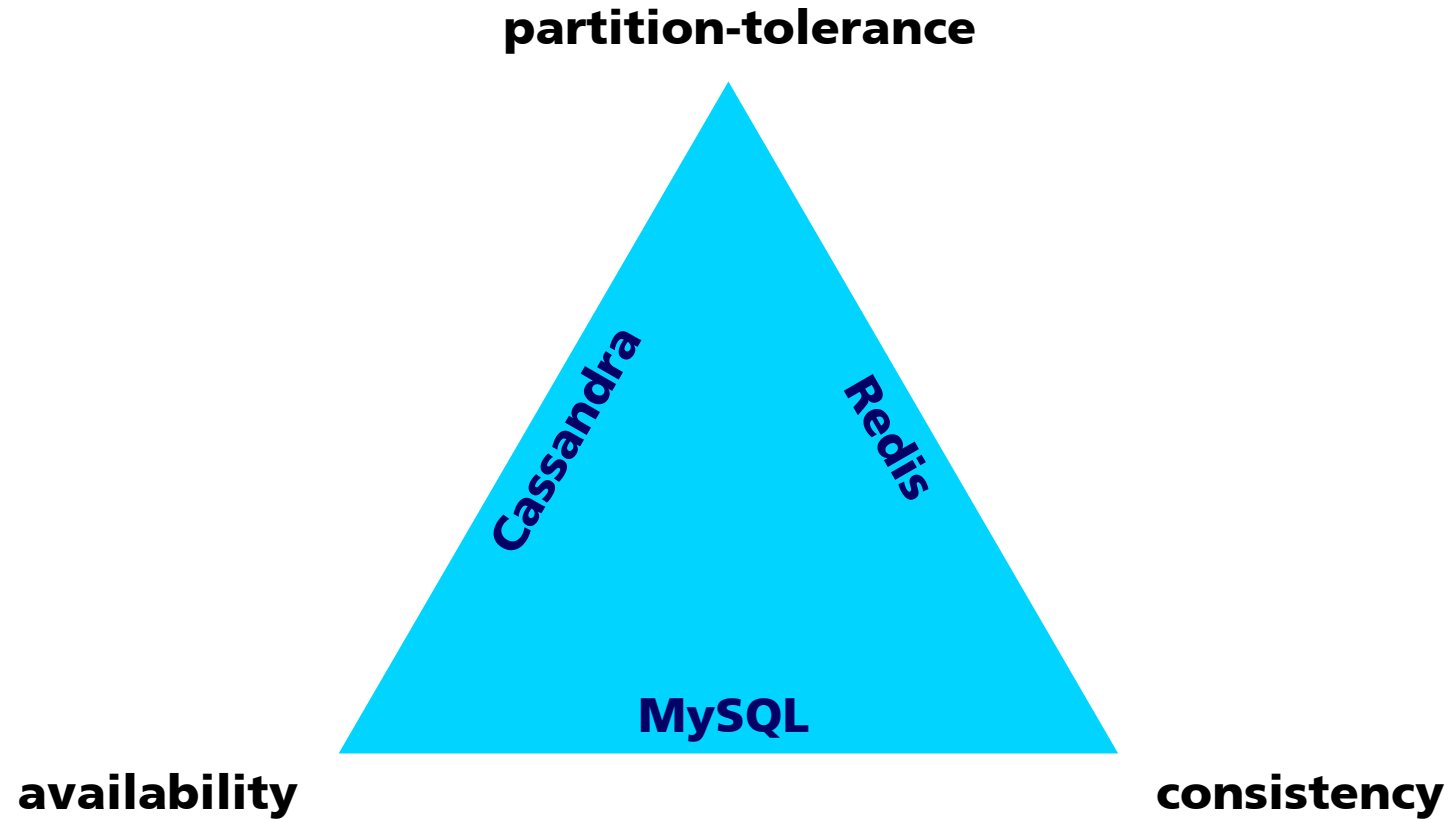
**paper cheque**

**banknotes**

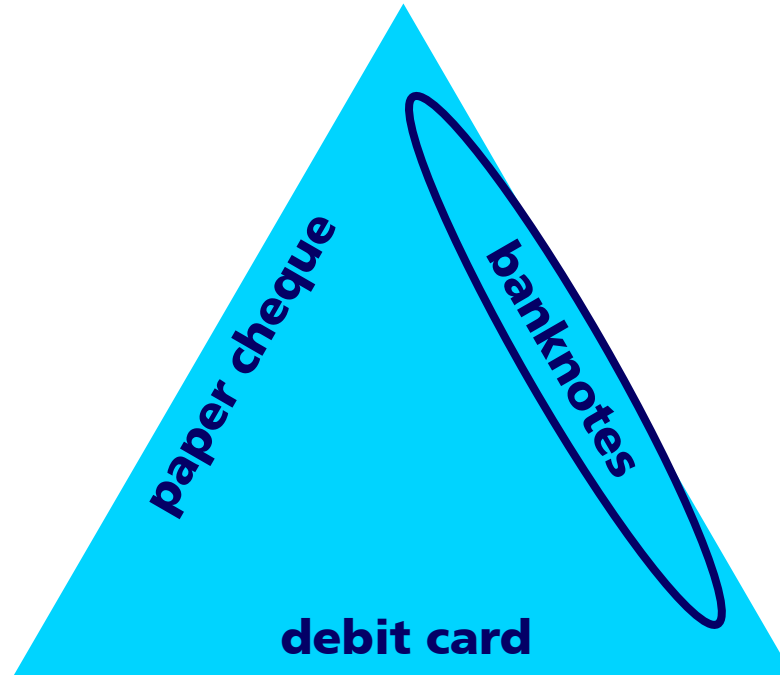
**debit card**

**loss recovery**

**no double-spending**



**offline-capable**

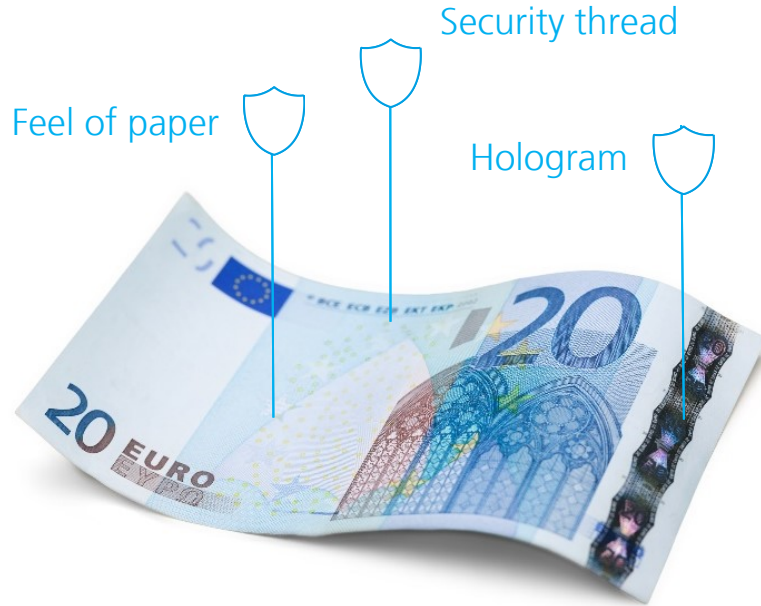


**loss recovery**

**no double-spending**



# Modelling digital cash after physical cash



# Now, where is my money?

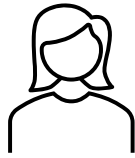
Custodial wallet



Bearer wallet



# How does a transaction work?



Alice

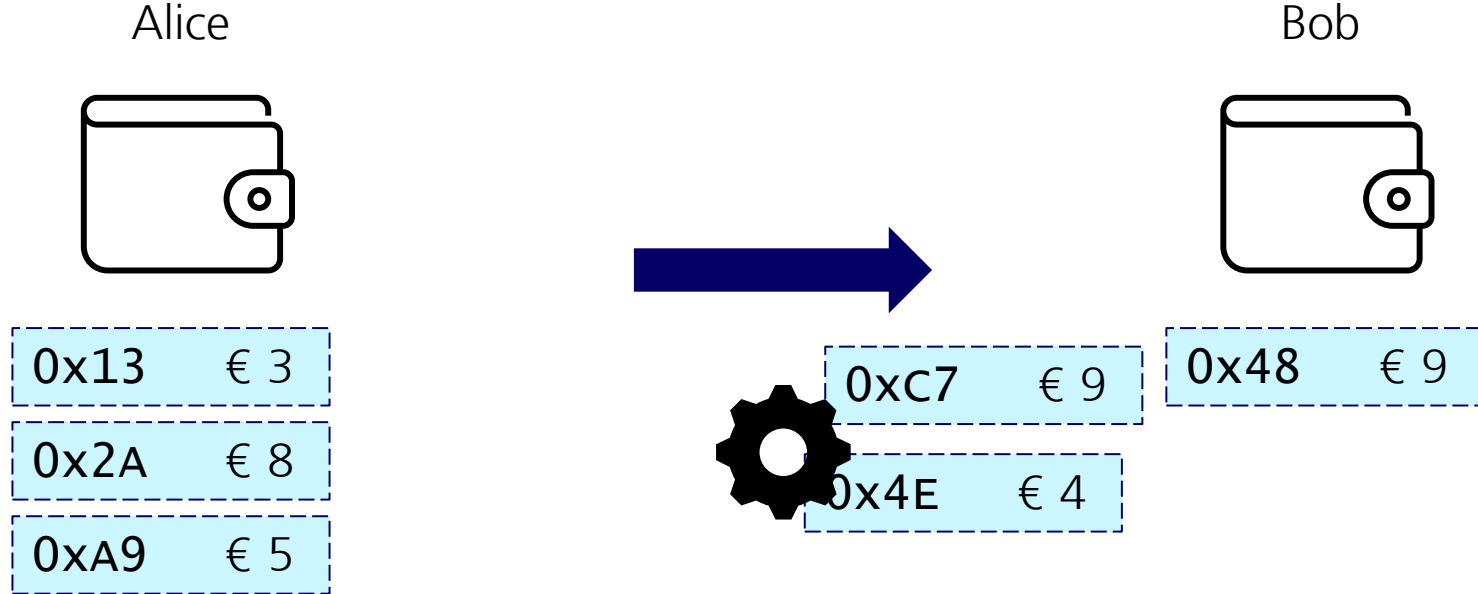


€ 9



Bob

# How does a transaction work?



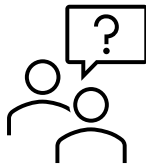


# Validation

Alice  
Bob

- € 9

+ € 9





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**Ownership**

**Payer identity**

**Payee identity**

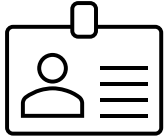
**Authenticity**



**Giesecke+Devrient**  
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# Security requirements of (digital) payments



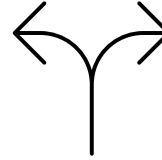
Payer identity  
Payee identity



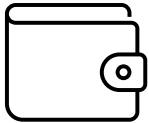
Non-repudiation



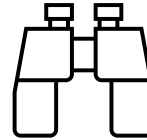
Authenticity



No double spending



Ownership



No tracing

The background of the slide is a collage of Botswana banknotes. A magnifying glass is positioned over a section of the notes, focusing on an illustration of a doctor in a white coat using a stethoscope on two young children. Other visible parts of the banknotes include portraits of men, the number '20', and the text 'Bank of Botswana' and 'MINISTER OF FINANCE'.

# Will this run on DLT?

## Maybe. Maybe not.

# Why or why not?



Consensus of  
various entities



One single source  
of trust





# Digital pound CBDC won't be programmable to avoid government control perceptions

April 3, 2023 • by Ledger Insights

## CBDC – How Dangerous is Programmability?

September 21, 2021

### Policy

#### Digital Euro Will Never Be Programmable, ECB's Panetta Says

Some observers have touted restrictions on how people can spend their money as an advantage of a central bank digital currency.

By Jack Schickler ⌚ Jan 23, 2023 at 4:28 p.m. Updated Jan 23, 2023 at 6:10 p.m.






# 'Het is tijd om bankbiljetten in een digitaal jasje te hijsen', zegt DNB-directeur Van Dijk

**Inge van Dijk | Divisiedirecteur betalingsverkeer DNB**

Het betalingsverkeer wordt snel digitaler, dus komt ook de centrale bank met een digitale euro. En nee, dat is niet bedoeld om de staat je uitgaven te laten controleren. „We willen helemaal niet alles zien.”

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 Marloes de Koning & Egbert Kalse  27 juni 2023 om 21:21

 Leestijd 7 minuten



# Questions? Answers!

Lars Hupel

<https://lars.hupel.info>

[lars.hupel@gi-de.com](mailto:lars.hupel@gi-de.com)



GOTO  
**Guide**



Remember to  
**rate this session**

THANK YOU!



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# Sources

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