

*Harvard Kennedy School – Study Group*  
*October 2023*

# Digital Monies

*Sessions:*

Tuesday October 10, 4:15 – 5: 30 PM: **Money and technology through the ages**

Tuesday October 17, 4:15 – 5: 30 PM: **The digital revolution in money and payments**

Tuesday October 24, 4:15 – 5: 30 PM: **Central Bank Digital Currencies**

Tuesday October 31, 4:15 – 5: 30 PM: **Monetary institutions for the digital age**

*Ignazio Angeloni*  
*(European University Institute)*

# Facts

1. *Payment habits change, they go digital*
2. *Use of paper-based instruments (banknotes, checks) declines, but is rather persistent*
3. *New payment instruments emerge, private and public, all digital*
4. *Lots of discussion, activity and “noise” around it*

# Number of Google search results



*about 800 million results*



*about 400 million results*



*about 700 million results*

# Questions

1. *What happens below the surface?*
2. *Is it a revolution, really (does the role of money really change)?*
3. *Is this good or bad?*
4. *What future? How money will/should look like in the digital age*

# Sources of knowledge

*1. History*

*2. Theory*

*3. Casual observation*

**Q: When did money begin?**

# Mesopotamia: 3000 BC



# Greece → Rome

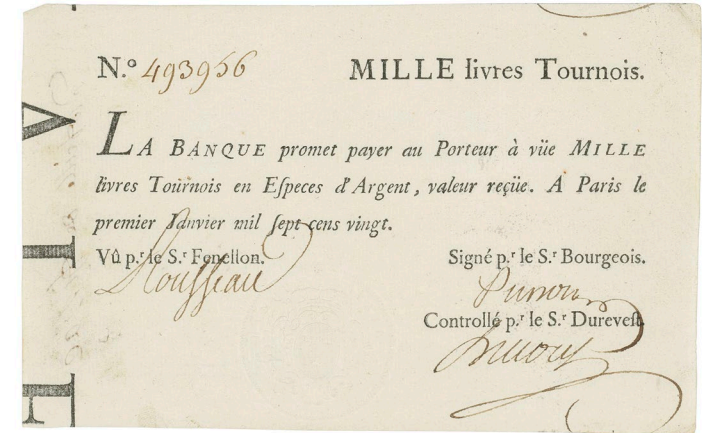


**The problem when value is embodied: debasement**

*Mark Aurel (161 AD): silver content 75%*

*Diocletian (305 AD): silver content 5%*

# China 12<sup>th</sup> Century → Europe



**The problems when value is disembodied:**

- 1. How to ensure acceptance?*
- 2. How to regulate issuance?*

# Gold Standard: 1815–1971



# Fiduciary money: 1971–now



**Q: What are the functions of money?**

# The economic functions of money

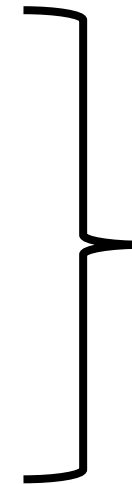
1. *Unit of account*

2. *Means of payment*

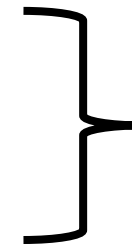
3. *Store of value*

4. *Provider of liquidity value*

5. *Instrument of speculation*



Jevons et al.



Keynes, Tobin

# Money, information, technology

1. *Money conveys information on underlying values*
2. *Always and everywhere, information travels on the best available technology:*



1. *Inseparable link between money and technology*
2. *Money's representation changes, not the underlying concept and requirements*

# Requirements

1. *Recognizable*
2. *Divisible*
3. *Transferable across space*
4. *Transferable over time (stable in value)*
5. *User-friendly (“uncomplicated”, “democratic”)*

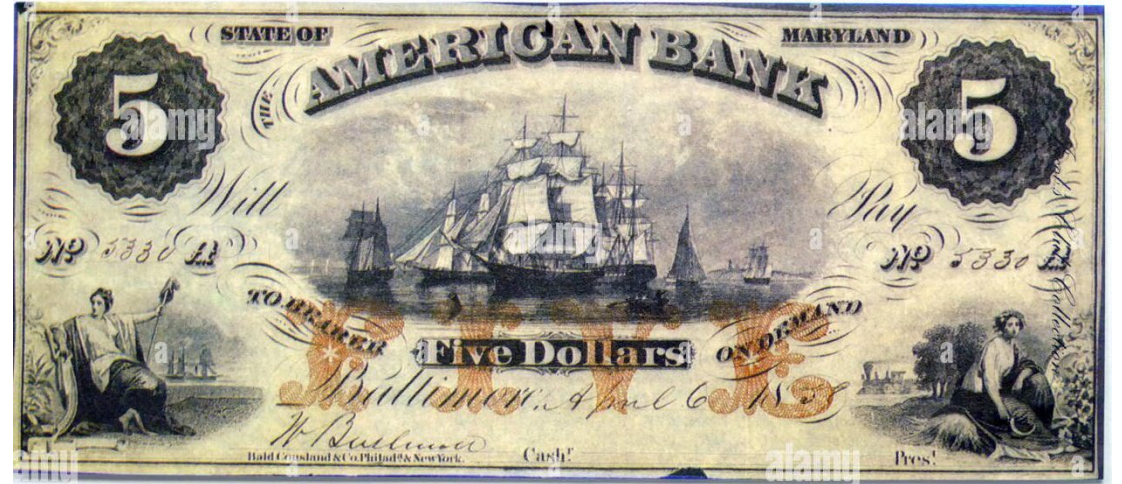
# Moving into the 20<sup>th</sup> Century

1. *Two major developments:*
  - a. *Wire-based telecommunication (telegraph, telephone)*
  - b. *Wireless telecommunication (radio)*
2. *Application to money was almost immediate*

# The case of the US dollar

1. *In the 19<sup>th</sup> century the US allowed “free banking”*
2. *The US\$ had existed since 1792*
3. *Private banks issued banknotes denominated in the single national currency (the US\$)*
4. *Dollar value varied across places depending on risk and transportation costs (horseback)*

# The US dollar system in the 19<sup>th</sup> Century



**Q: How many US dollars existed in 1860?**

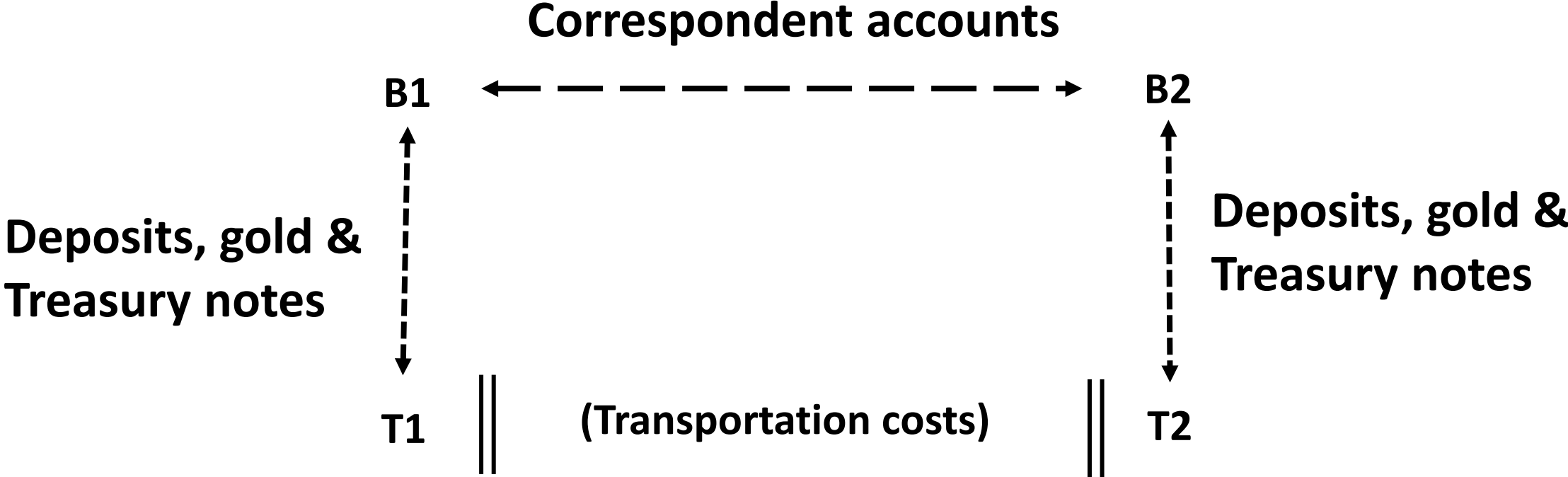
**33 US States; 31 m. people; 1600 banks**

**$\cong$  7,000 different US dollars**

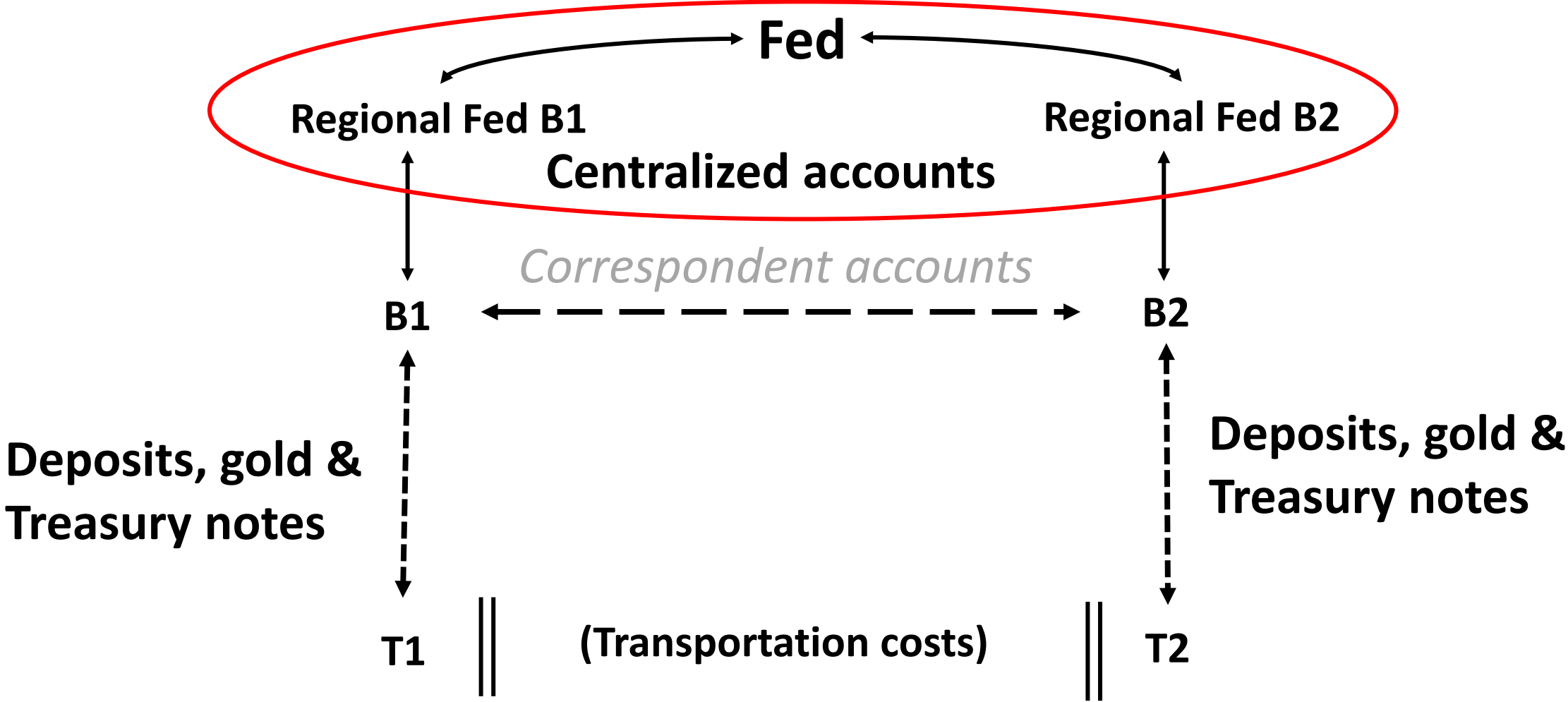
# The US dollar system before 1913

T1 ||| (Costs and risks of transporting  
gold and paper currency ) ||| T2

# The US dollar system before 1913



# The US dollar system after 1918



# Key characteristics of Fedwire

- ✓ *Instant communication (wire)*
- ✓ *Trusted central party (the Fed)*
- ✓ *Central ledgers (paper)*
- ✓ *Payment finality*
- ✓ *A single US dollar*

# In Sum:

	<b>Mesopotamia</b> (clay)	<b>Greece- Rome</b> (metal)	<b>China-Europe</b> (paper)	<b>Fedwire</b> (wire signals)
<b>Trusted central party</b>	✓	?	?	✓
<b>Light-speed communication</b>	X	X	X	✓

# Readings

Glyn Davies, *History of Money: From Ancient Times to the Present Day*, (University of Wales Press, 2016).

John Weatherford, *The History of Money* (Three Rivers Press, 1997).

K. Garbade and W. Silber, “The payment system and domestic exchange rates; technological vs institutional change”. *The Journal of Monetary Economics* 5, 1979.

Board of Governors of the Federal Reserve System, *The Fedwire Funds Service; Assessment of Compliance with the Core Principles for Systemically Important Payment Systems*, 2014

Ben Norman, Rachel Shaw, and George Speight, “The history of interbank settlement arrangements: exploring central banks’ role in the payment system”; Bank of England Working paper n. 412, 2011