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Content Reference: CBDCs – Money Reimagined

Digital Finance – BSc Course – Standalone Lecture

Learning Objectives

After engaging with this reference sheet and the companion lecture, you will be able to:

- **Distinguish** retail from wholesale CBDCs and understand why most central banks prioritise wholesale [Understand]
- **Compare** three design choices (account-based, token-based, tiered) against objectives (privacy, financial inclusion, AML) [Analyze]
- **Identify** the disintermediation risk CBDCs pose to commercial banks [Apply]
- **Evaluate** the Swiss SNB Helvetia-III programme as a credible wholesale CBDC model [Evaluate]

1. Key Definitions

- **CBDC (Central Bank Digital Currency)** — a direct liability of the central bank issued in digital form to the public or to financial institutions.
- **Retail CBDC** — held by the general public; competes with cash and bank deposits.
- **Wholesale CBDC** — held only by financial institutions for interbank settlement; competes with commercial-bank reserves at the central bank.
- **Account-based CBDC** — balances recorded against identity-verified accounts; easy to AML but weak on privacy.
- **Token-based CBDC** — unit of value that transfers bearer-style; stronger privacy, harder AML.
- **Tiered / two-tier model** — central bank issues to banks, banks distribute to users; preserves the current banking hierarchy.
- **Disintermediation risk** — bank deposits flee to CBDC in a crisis, accelerating runs.
- **Cross-border interoperability** — linking multiple CBDCs so FX transactions settle atomically without correspondent banks.

2. Core Concept: Why Wholesale First

Wholesale CBDC is the quiet revolution

Wholesale CBDC does not ask retail customers to change anything. It upgrades the central-bank reserves layer so tokenised assets can settle atomically against central-bank money rather than against a commercial-bank IOU. This eliminates Herstatt risk in FX and collapses T+2 to T+0 for tokenised securities without disintermediating banks.

Almost every G20 central bank is piloting wholesale CBDC; retail CBDC is politically much more contested (see the ECB digital-euro debate and the near-universal US opposition).

3. Key Figures & Data

- **134 countries** (BIS 2024 CPMI survey) are researching, piloting, or have launched a CBDC; 3 retail launches (Bahamas Sand Dollar, Jamaica JAM-DEX, Nigeria eNaira) plus China's pilot at ∼260M users.
- **Project Helvetia III** (SNB, 2024) settled six wholesale CBDC transactions against tokenised bonds on SIX Digital Exchange – the first central bank to do this in live production.

- **Project Agorá** (BIS + 7 central banks, 2024–2025) is designing a cross-border wholesale CBDC prototype across USD, EUR, GBP, JPY, CHF, KRW and MXN.
- **Digital euro** timeline (ECB): preparation phase 2023–2025, legislative phase in progress; possible issuance window 2027–2028 contingent on Council/Parliament approval.
- **GENIUS Act** (US, 2025) establishes a federal framework for payment stablecoins and explicitly *bars* the Federal Reserve from issuing a retail CBDC without Congressional authorisation – a notable rejection of the retail path.
- **BCG/Citi/McKinsey** estimates for retail-CBDC adoption vary widely: 0.5–4% of M1 by year-5 in advanced economies depending on design, remuneration and cash-access policy.

4. Worked Example

Estimating deposit outflow from a retail CBDC

Scenario. A mid-size Eurozone bank holds €50 billion in retail deposits. A retail digital euro launches; surveys suggest 8% of deposits migrate in year 1 (mid-point of BCG/ECB ranges). Bank lending depends on deposit funding at a cost of 2%; replacement funding from the ECB standing facility costs 3.75%.

Migrated deposits	€4,000M
Replacement-funding premium	$3.75\% - 2.00\% = 1.75\%$
Annual extra funding cost	**€70M**

A €200 holding cap on retail CBDC (one of the ECB's proposed safeguards) would reduce migration to roughly 2–3%, cutting the cost to €20–30M. This is the arithmetic behind every holding-cap debate.

5. Self-Check Questions

1. Why does a holding cap reduce disintermediation risk but weaken the utility of a retail CBDC for large recurring payments (e.g. rent)?
2. Contrast the Chinese e-CNY design with the Swiss Helvetia-III design on (a) retail access, (b) privacy, and (c) payment programmability.
3. Compute the extra funding cost for a bank with €20 billion retail deposits and a 5% migration rate if the premium is 2%.

[Answers hidden in student version.]

6. Further Reading

- BIS (2024). "Embracing Diversity, Advancing Together: Results of the 2023 BIS Survey on Central Bank Digital Currencies and Crypto." BIS Papers No. 147.
- Swiss National Bank (2024). *Project Helvetia III.*
- ECB (2023). *Progress on the Investigation Phase of a Digital Euro.*
- Auer, R. & Böhme, R. (2021). "Central Bank Digital Currency: The Quest for Minimally Invasive Technology." BIS Working Paper 948.
- US Congress (2025). Guiding and Establishing National Innovation for U.S. Stablecoins (GENIUS) Act.
