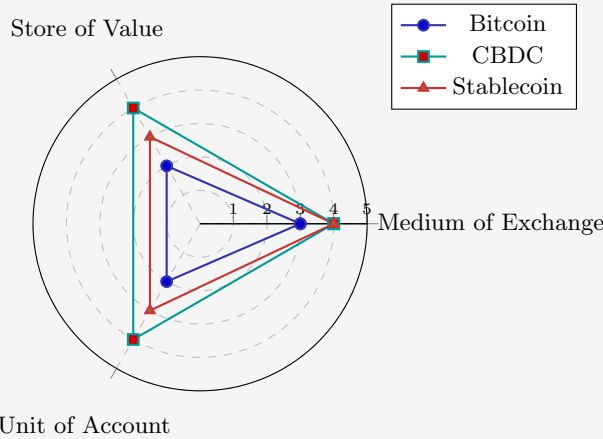


Pre-Class Discovery Handout: Emerging Topics in Digital Finance

Activity 1: Is It Money?

Scenario: Evaluate Bitcoin, a retail CBDC, and a stablecoin (USDC) against the three classical functions of money. The radar chart below shows one possible scoring — do you agree?



Function	Bitcoin	CBDC	Stablecoin
Medium of Exchange	4	4	4
Store of Value	3	5	4
Unit of Account	3	4	4

- Q1:** Score each asset from 1 (poor) to 5 (excellent) on each function. Fill in the table above.
- Q2:** Which asset comes closest to “real” money? Why?
- Q3:** What prevents Bitcoin from scoring higher on “Store of Value”?

Activity 2: DeFi Yield Trap

Scenario: A DeFi protocol advertises 20% APY on stablecoin deposits. A traditional savings account pays 1.5% APY.

- Q1:** Calculate the annual earnings on CHF 10,000 for each option.
- Q2:** List at least 3 risks that explain why DeFi yields are so much higher than traditional savings. (Consider: smart contract bugs, impermanent loss, rug pulls, regulatory uncertainty.)
- Q3:** Is the extra CHF 1,850 annual return worth the additional risks? Justify your position in 2–3 sentences.

Activity 3: CBDC Design Choices

Scenario: You are a central bank governor designing a retail CBDC. For each dimension, choose one option and justify your decision.

Dimension	Option A	Option B	Choice	Justification
Identity	Account-based	Token-based		
Interest	Interest-bearing	Non-interest-bearing		
Privacy	Full privacy	Traceable		
Connectivity	Online-only	Offline-capable		

Q1: For each dimension, choose an option and write a one-sentence justification.

Q2: How does your design affect commercial banks? (Hint: disintermediation risk.)

Q3: Is there a design that satisfies both privacy advocates and law enforcement? Explain.

Solutions

Activity 1: Is It Money?

- A1:** Reasonable scores: Bitcoin — MoE: 2–3 (limited merchant acceptance, slow confirmation), SoV: 2 (extreme volatility), UoA: 1–2 (prices are not denominated in BTC). CBDC — MoE: 4–5 (legal tender, instant settlement), SoV: 4–5 (central bank backed, stable), UoA: 4–5 (denominated in national currency). Stablecoin — MoE: 3–4 (widely used in crypto, growing merchant adoption), SoV: 3 (peg can break, reserve risk), UoA: 3 (pegged to USD, but not a sovereign unit).
- A2:** A retail CBDC scores highest because it is legal tender issued by the central bank, combining the stability and trust of fiat currency with the programmability and efficiency of digital infrastructure. It fulfills all three functions at near-sovereign level.
- A3:** Bitcoin’s extreme price volatility (annual swings of 50–80%) makes it unreliable as a store of value. A holder cannot be confident that purchasing power will be preserved over short or medium horizons. Additionally, the fixed supply creates deflationary pressure that incentivizes hoarding over spending, undermining its use as everyday money.

Activity 2: DeFi Yield Trap

- A1:** DeFi: $\text{CHF } 10,000 \times 20\% = \text{CHF } 2,000$. Traditional: $\text{CHF } 10,000 \times 1.5\% = \text{CHF } 150$. The DeFi protocol pays CHF 1,850 more per year.
- A2:** (1) Smart contract risk: bugs or exploits in the protocol code can drain all deposited funds (e.g., the Euler Finance hack lost \$197M). (2) Rug pull / governance risk: anonymous developers can withdraw liquidity or change protocol parameters, leaving depositors with worthless tokens. (3) Regulatory risk: governments may ban or restrict DeFi protocols, making withdrawals impossible. (4) Stablecoin de-peg risk: the underlying stablecoin may lose its peg (e.g., UST collapse), wiping out principal. (5) Impermanent loss: for liquidity providers, price divergence between paired assets erodes returns.
- A3:** The risk-adjusted return is likely negative. A single smart contract exploit can result in 100% loss of principal, far exceeding years of accumulated yield. The extra CHF 1,850 represents compensation for bearing risks that are difficult to quantify and impossible to insure against. For most retail investors, the traditional account’s deposit guarantee makes the lower return the rational choice.

Activity 3: CBDC Design Choices

- A1:** Account-based: easier to implement KYC/AML and integrate with existing banking infrastructure. Non-interest-bearing: avoids competing with commercial bank deposits, reducing disintermediation risk. Traceable (with privacy thresholds): enables AML compliance while allowing small anonymous transactions. Offline-capable: ensures financial inclusion in areas with poor connectivity and resilience during network outages.
- A2:** If the CBDC is attractive enough (interest-bearing, convenient), depositors may shift funds from commercial banks to the central bank, reducing the deposit base that banks use for lending. This “digital bank run” risk could destabilize the financial system. Mitigations include holding limits (e.g., max CHF 3,000 per person) and zero or negative interest rates on CBDC balances.
- A3:** A tiered privacy model can partially satisfy both sides: transactions below a threshold (e.g., CHF 500) are anonymous like cash, while larger transactions require identity verification. This preserves everyday privacy while giving law enforcement visibility into large or suspicious flows. However, no design fully satisfies both camps — privacy advocates want cash-like anonymity at all levels, and law enforcement wants full traceability. The tradeoff is fundamentally political, not technical.