


Decentralized Finance: past, present, future.

What is Defi?

Creditibly **Neutral**, **open**, **fair** mechanism for facilitating trade and leverage in a purely algorithmic manner
Composite of

Why these characteristics?

Neutral: No single party can censor/block trade

Open: Anyone can submit transactions, provide liquidity

Fair: participants earn income in the system pro-rata to the amount of resources they put in

Purely Algorithmic: "code is law" dominates settlement and all subjective functionality is encapsulated via seps, border oracles

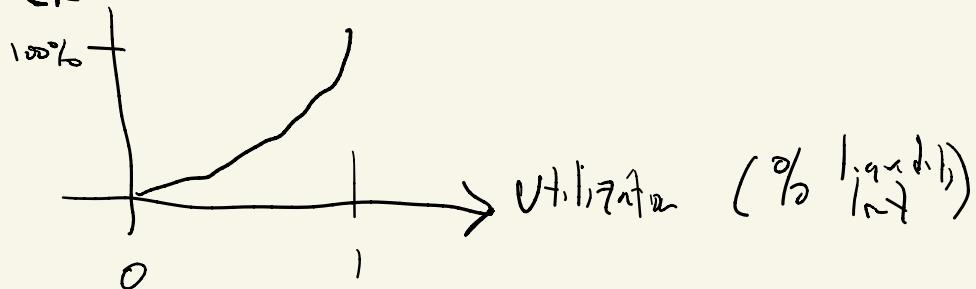
Examples

- Uniswap, AMMs: Create open two-sided market for trade
Crit.: anyone can't be a liquid provider
anyone can't take everywhere —
(see GMG)
- Aave (company): Decentralized BlockFi
Neutral: Cost to claim liquidity grows w/ mbor
Open: Anyone can borrow/lend (no KYC)
Fair: Everyone pays the same rate, runs pro-rate share

Purely Algorithmic: No central authority chooses rates

→ Rates programmed in code; no subjectivity

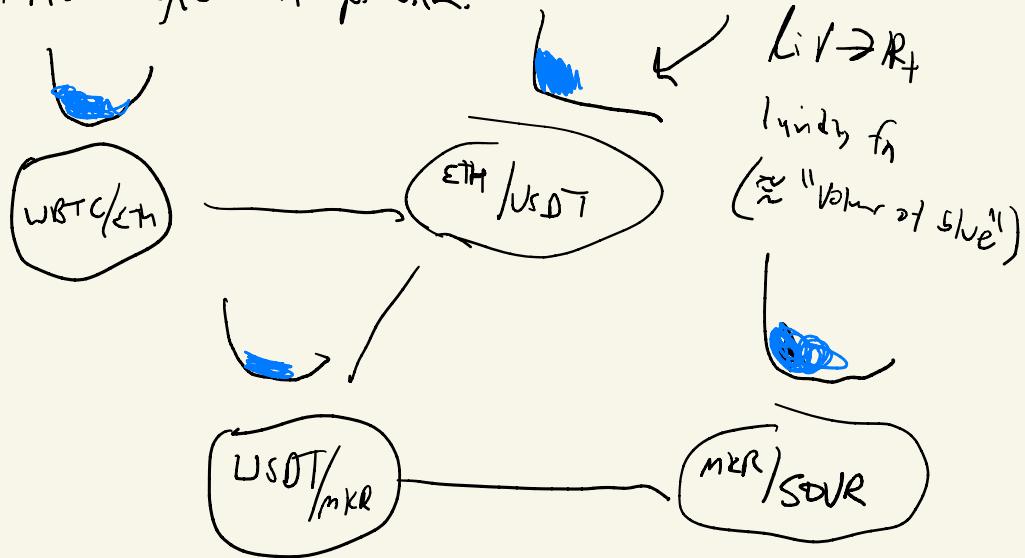
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What makes this superior to TradFi / what do you get that you don't get in TradFi?

1. Liquidity network effects: Composability and AMMs are

- ~ Google-like advancement \rightarrow Turn liquidity provisioning into a ^{algo.} search problem.



WBTC \rightarrow SOVR by traversing Amm graph:

$$G = (V, E)$$

$$g: V \times \mathbb{R}_+ \rightarrow \mathbb{R}_+$$

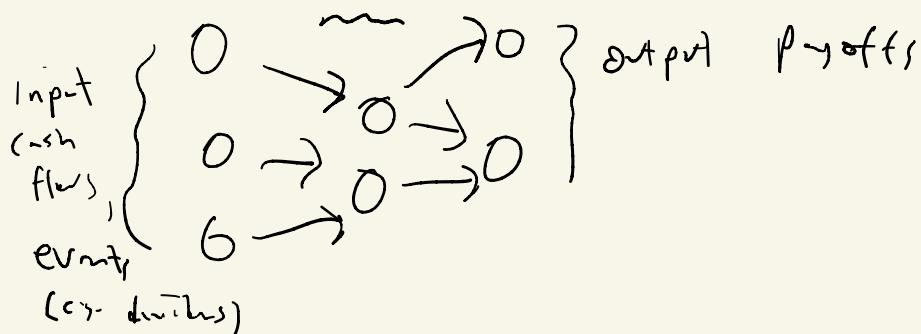
price
impact

$$J = \{(A, B) : \exists A, B \text{ limits } p \in \mathbb{R}\}$$

$$E = \{(v, w) : v, w \in V, \text{Set}(A) \cap \text{Set}(B) \neq \emptyset\}$$

2. Expressivity: By borrowing and lending LP shares, you can replicate any payoff ((Evans, 2020), (Hahn, 2021))

3. Contracts are immediately exchangeable: In traditional, Mitt Lewin's old job was to write decision trees
temptation



But this is settled/executed DTC (hedge fund
broker). Lawyers collect huge fee for structuring
execution \Rightarrow transfers are slow \Rightarrow hard to
make exchange tradeable, fungible, standardised
contracts.

Defi:

- Encode decision tree in code
- Replicate payoffs using AMM + liquidity

↳ Remove lawyers!

Defi: Borrowing WBTC against cash share (= collateral + fees) and putting into Compound for 10-15% yield

TradFi:

- a. Take shares of VIVU
- b. Borrow cash against them from Goldman (no transparency into borrowing costs)
- c. Sell Repo agreements

4. Better Capital Efficiency: Composability means that liquidity from multiple contract types (bonding, AMM, synthetic, prop) can be mixed and matched and reused (freeing capital necessary to facilitate txns, making profit). TradFi: trust prime broker on this

Defi is probably better on PoW than PoS

In PoS, Defi yields directly compete w/ Li
Security (not true in PoW unless hash power
deriv. market is big) [Chitra, 2020]

Can alleviate this somewhat w/ staking derivatives
[(Chitra, 2021)] but this is extremely hard to
design correctly.

A bit about me:

- Used to work on ASICs - how I got into
BTC
- Used to do HFT - why Defi requires us

Q tarunChitra.