

# Decentralized Finance

Synthetic And Derivatives; Portfolio Management; Insurance;  
Information and Data Markets

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# Wallet Account Overview

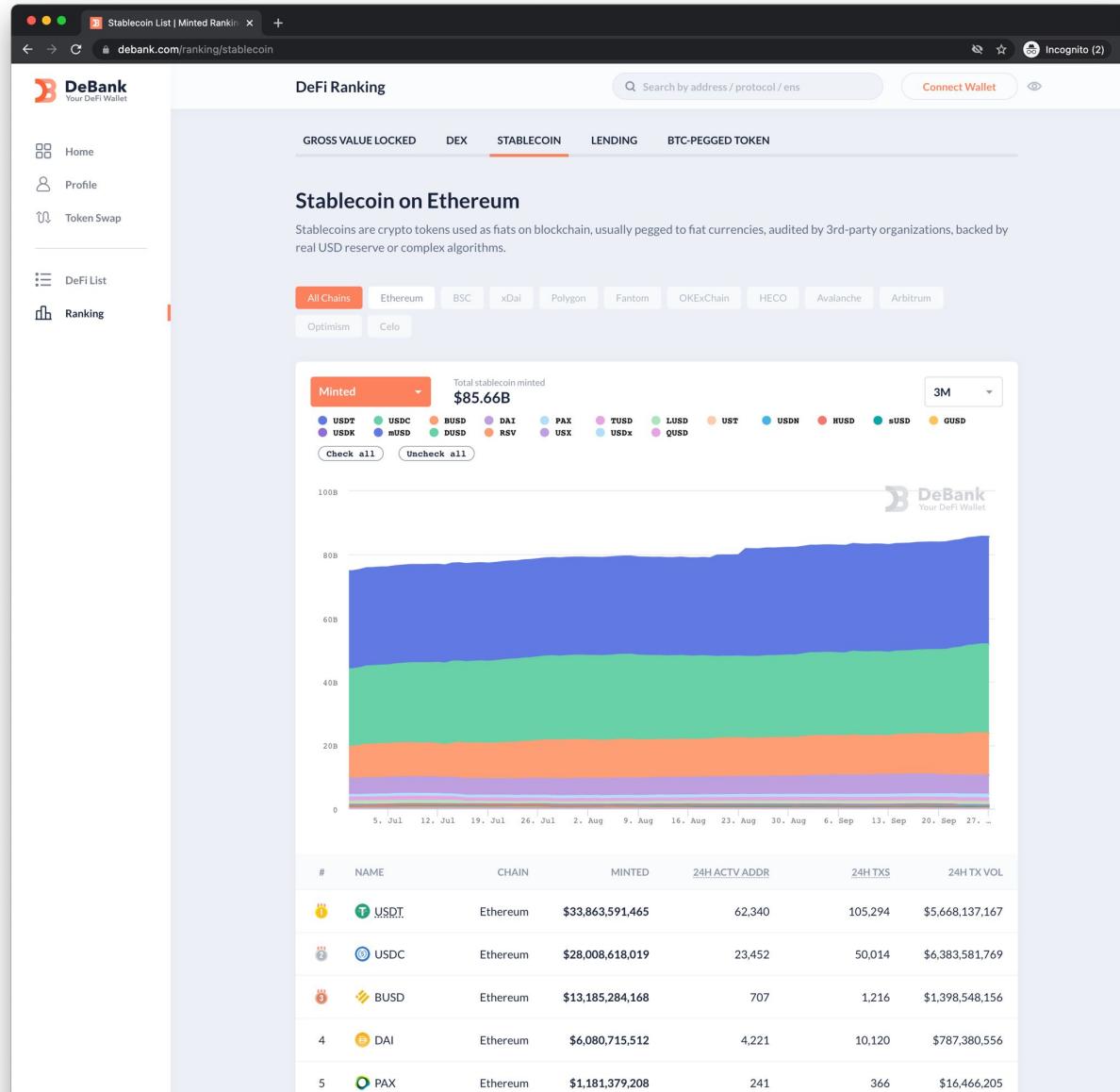
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# Economic Models

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- You're given a model
  - Represents (often simplifies) an economic process
  - Contains variables
  - Logical/Quantitative relationships between variables
- Example: **Inflation**
  - Measuring inflation requires a *behavior model*
  - Differentiate relative vs. inflation price change

# Stablecoins on Ethereum



# Stable?

## Inflation Calculator

If in  (enter year)

I purchased an item for \$

then in  (enter year)

that same item would cost: **\$3.32**

Cumulative rate of inflation: **232.0%**

**CALCULATE**

“Stablecoins” are not “stable”, but relatively more stable than other cryptocurrencies.

# How do Stablecoins work?

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MakerDAO



Synthetix



AMPL



USDC

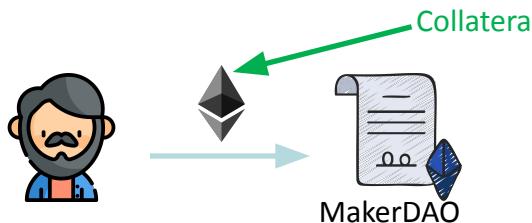


USDT

# MakerDAO

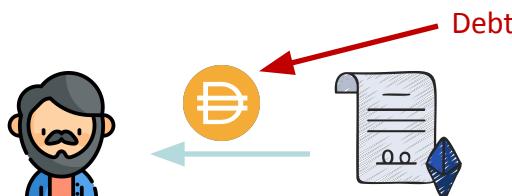
## Stablecoin

Step 1



ETH deposited to open CDP  
150% collateral mints 100% debt

Step 2



Draw DAI

Step 3

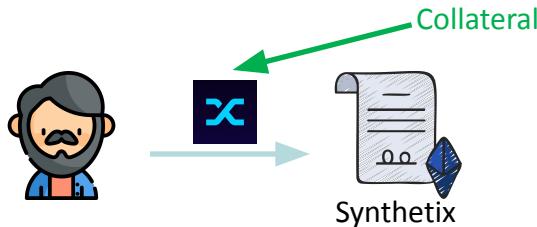


Pay back DAI to unlock ETH

# Synthetix

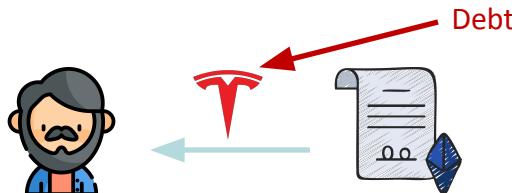
## Mint a derivative asset

Step 1



SNX deposited to mint derivative  
600% collateral mints 100% derivative

Step 2



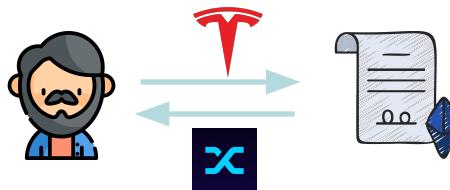
Draw derivative  
(e.g. sTSLA share)



Report prices external  
to the blockchain

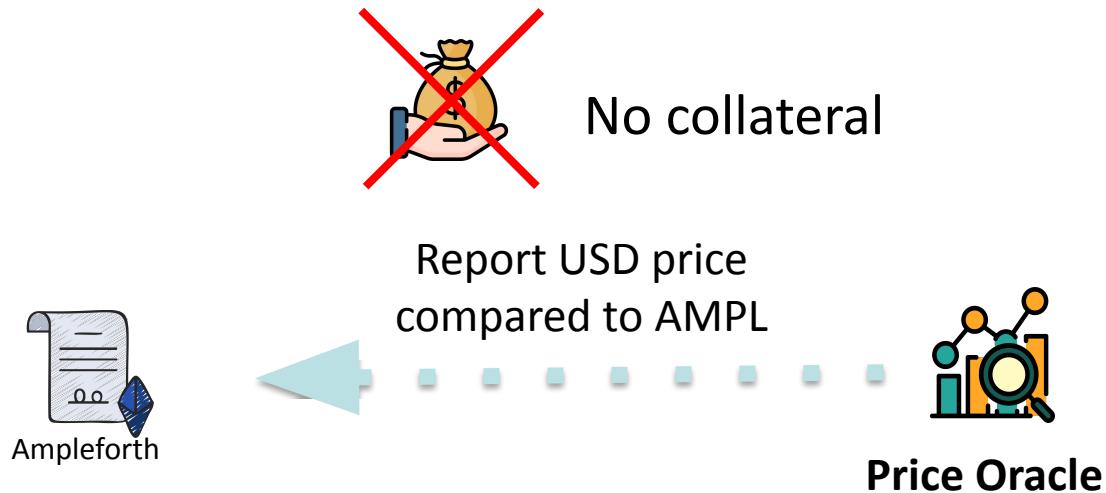
Price Oracle

Step 3



Pay back sTSLA to unlock SNX

# Ampleforth (AMPL)

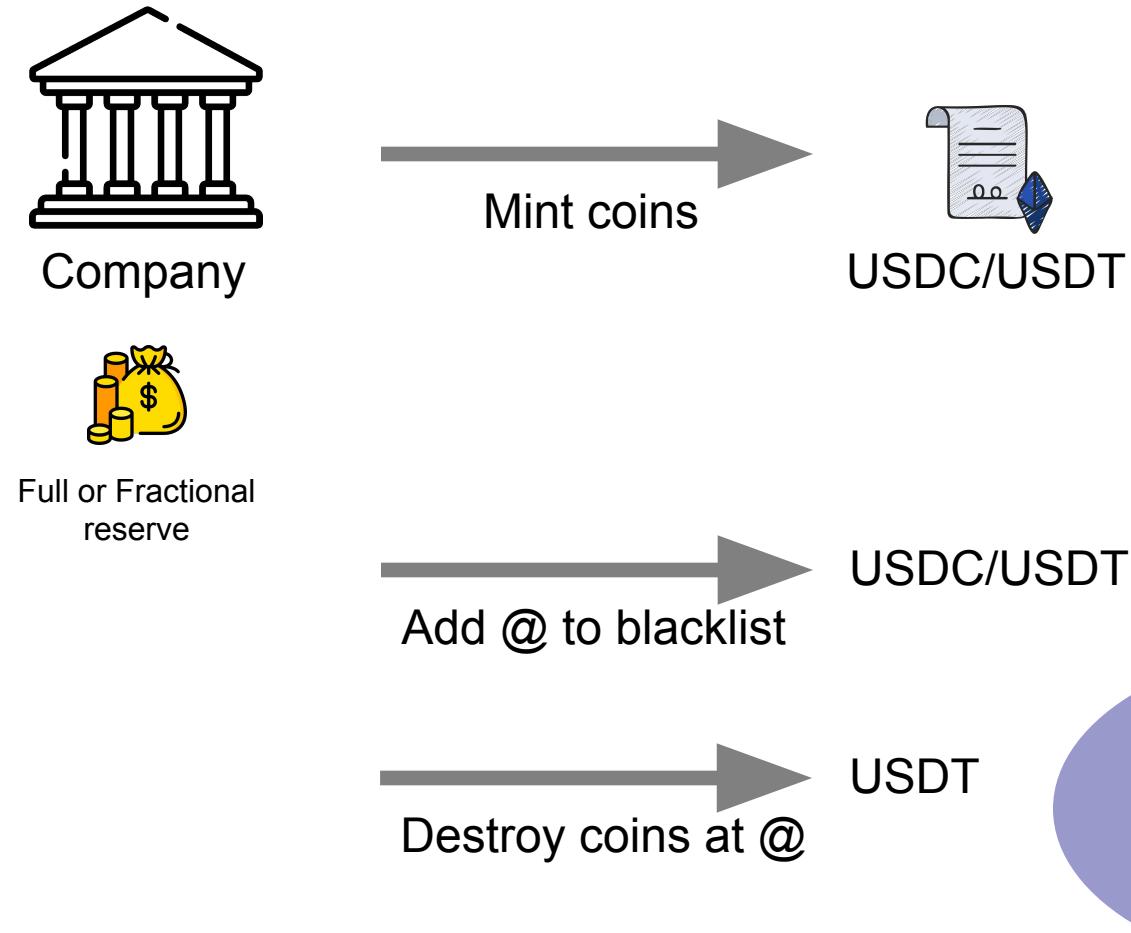


## ■ Three design states

- Expansion: if  $1 \text{ AMPL} > 1 \text{ USD}$ , add supply
- Contraction: if  $1 \text{ AMPL} < 1 \text{ USD}$ , remove supply
- Equilibrium: no action taken

Systemic implications!

# USDC and USDT



USDT blacklisted  
over 400  
accounts, +44M  
USDT destroyed.

# USDC and USDT

```
1 function transfer(address _to, uint _value) public
2     whenNotPaused {
3     require(!isBlackListed[msg.sender]);
4     if (deprecated) {
5         return UpgradedStandardToken(upgradedAddress).
6             transferByLegacy(msg.sender, _to, _value);
7     } else {
8         return super.transfer(_to, _value);
9     }
10    function addBlackList (address _evilUser) public
11        onlyOwner {
12        isBlackListed[_evilUser] = true;
13        AddedBlackList(_evilUser);
14    }
15    function destroyBlackFunds (address _blackListedUser)
16        public onlyOwner {
17        require(isBlackListed[_blackListedUser]);
18        uint dirtyFunds = balanceOf(_blackListedUser);
19        balances[_blackListedUser] = 0;
20        _totalSupply -= dirtyFunds;
21        DestroyedBlackFunds(_blackListedUser, dirtyFunds);
22    }
23}
```

# DeFi Bank Run?

- CeFi Bank Run
  - Dangerous if fractional reserve
  - Most clients don't receive assets (or a minimum)
- DeFi Bank Run
  1. Event: USDT blacklists a pool, Stablecoin de-pegs
  2. Traders will exit pools
  3. Those who exit first receive the best prices
  4. Try to build blacklist detection bots

