Cryptoeconomics

Or How I Learned to Stop Worrying and Love Internet Money

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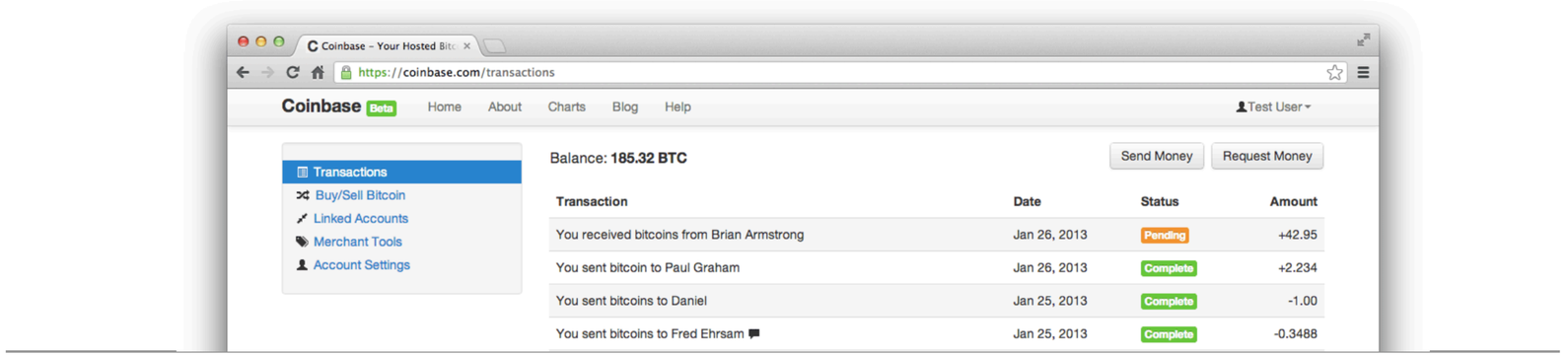
Polychain

Coinbase Beta

Bitcoin Made Easy

Coinbase is the simplest way to buy, use, and accept Bitcoin.

Email: Your Email Password: Choose A Pas Create My Account



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Mining 2011

Mining
2013

Mining 2015

Cryptocurrencies are human coordination mechanisms


bitcoin
life

Value = Security

- Market Capitalization of a cryptocurrency allows:
    - Transfer of $
    - Execution of contracts
    - Farther out: voting, identity, etc
- Speculators are **critical** to the premise of blockchains

Adversaries

- Two types of adversaries
    - Profit-motivated **within** the system
        - Paying miners to prevent sybil attacks
    - Profit-motivated **outside** the system
        - Derivative contracts mean you cannot reason about the security of a system by only examining the contract or protocol alone

Why buy coins?

- To make applications work, we must have people buying coins first
- How can we design a cryptocurrency to be friendly to speculators?
    - Launch distribution
    - Inflation curve
    - Long-term economics
- We can now use software to program assets

Distribution

- Who owns the coins?
    - “Of the over 85 billion tokens… the [Stellar Foundation] burned over 55 billion… the value of the burned tokens is nearly $4.7 billion.”
    - “The coin has reacted positively to the news, seeing a price increase of nearly 25% on the day at press time.”
- If the Foundation represents holders, why not continue to burn coins?
- Legitimacy and Fairness (Gini Coefficient)

ICOs

- No-caps auction
    - Efficient market price discovery, but timing participation is hard
- Capped-per-participant
    - Incentivizes sybil attacks as there is not price discovery in the auction
- Capped auction
    - Limits participation and encourages whales to make a “trade”

Why did ICOs raise Billions?

- block.one designed a daily auction to distribute EOS over one year
    - As EOS had price discovery, auction became simply an arbitrage for traders
    - Traders don’t care if buying from order book or someplace else
    - EOS price rising meant more capital for block.one
    - Core design problem is block.one contributing to its own auction to earn a larger % of the EOS coins.

Forks & Airdrops

- Bitcoin Cash & Bitcoin SV: “Valid chain” is simply social Schelling point
    - Forks & airdrops distribute to existing coin holder set
- Handshake: Airdrop to GitHub account SSH keys
- Dfinity: Airdrop with KYC for sybil resistance

Inflation Security

- Security = $ per hour paid to miners
- Security scales with market capitalization
    - Assumes profit from attack is inside the system
- Higher inflation = better security to market cap ratio
- Lower inflation = better asset to hold (higher market cap)

Inflation Security

- Proof of Work and Proof of Stake handle 51% attacks differently
    - In PoW, hash algorithm must be changed, *all* miners go offline
    - In PoS, *only* the attacking coins are deleted

Bitcoin Long Term Security

- $/hour to miners :: Market Cap
- As block rewards trend to zero, reliance on transactional fees
- If Market Cap grows by 50x (gold parity)…
- …Then transactions are going to be very expensive
    - (this is still a massive unsolved problem with bitcoin)
    - Is this all priced in today?

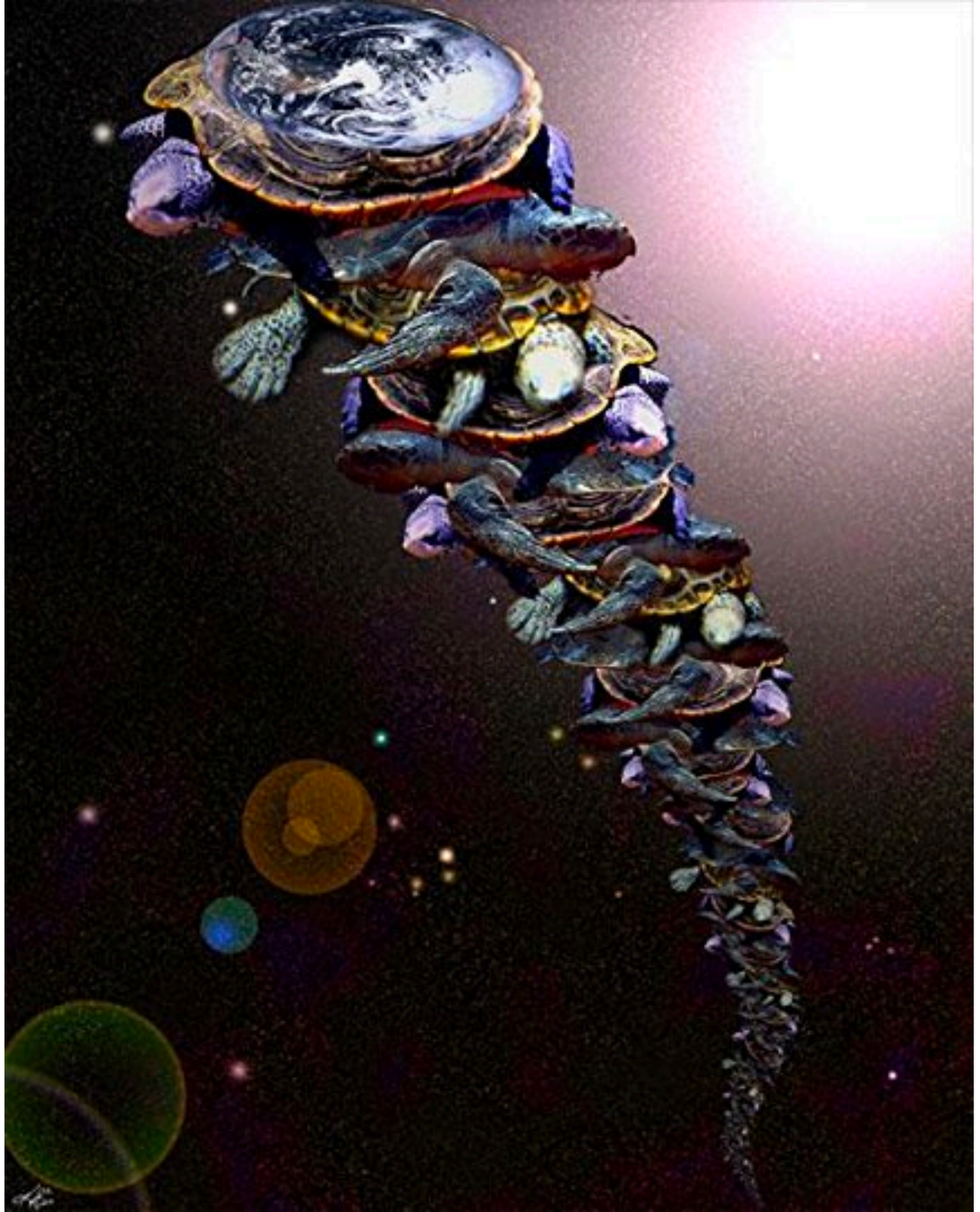
Lock-ups?

- Offline, contractual lockups of coins means some % of coins which cannot be sold, will be sold in the future
- Means skewed pricing based on imperfect information and opaque offline contracts
- Large supplies which will be “unlocked” is a bad environment to be a buyer
- As we saw with Stellar, any Foundation is usually adversarial with holders

A Buyer’s Market

- At the end of the day, you can’t make people buy coins
- You can, however, program a system which encourages people to buy coins
    - This is a **critical** part of building a secure system!

Once we have a base layer with value we can build so much more!



Decentralized Finance

- Now that we know how to bootstrap programmable assets, what can we build on top of these blockchains?
- Financial services (DeFi):
    - Lending
    - Synthetic assets (stablecoins)
    - Trading
    - Information Markets? Insurance Pools?

Oracles

- Most financial services rely on Oracles
- Feeding data into the blockchain is equally difficult as determining if a block is valid! However, the stakes are usually lower.
- Most constructions today are a consortium model of trusted parties
- This continues to be an area of significant research
    - Could a PoS model be used to feed data into contracts?

Lending

- Lending rates in PoS protocols will never be lower than the staking inflation rate!
    - **Contracts and underlying protocols have interactions**
- Lending can be pooled and market based (Compound Finance)
    - Or fixed rate (MakerDAO)
- Lenders seeking yield
- Borrowers going short or getting leverage

Synthetic Assets

- MakerDAO allows participants to collateralize ETH to get a loan in DAI
    - Use your ETH to get a loan directly from a contract!
- DAI tracks USD
    - In theory a DAI-like instrument can track anything!
- Once we bootstrap base coin value, and have a price oracle, we can have infinite synthetics

Trading

- 0x model
    - Orderbook off chain?
    - ZKPs may massively improve performance
- MerkleX
    - “Batching” of trades means trusting exchange for a ~1 minute
- Uniswap
    - Automatic Market Maker model

Proof of Weak Hands

- In PoWH contract, people buy and sell tokens direct from the contract
    - Buys, sells, transactions are penalized by 10% fee which goes to holders
    - Exotic financial products we've never seen before now built by individual hackers

Software has Bugs

- $50,000,000 stolen in theDAO hack
    - Chain hard fork results in Ethereum Classic
- $30,000,000 stolen in Parity Multisig hack
- $150,000,000 frozen in the Parity Multisig contract
    - “I accidentally killed it” -Devops199
- $2,300,000 lost in PoWH contract
    - “i made it, but you’re all idiots” -functionZer0

Blockchains are Complicated

- “Flash Boys 2.0: Frontrunning, Transaction Reordering, and Consensus Instability in Decentralized Exchanges”
    - By controlling what transactions are included in blocks, time-sensitive contracts can be manipulated
- Multi-Collateral Dai launched today!
    - Synthetics backing synthetics
- A “Tether” to the real world legal system is an alternative to crypto-collateralized synthetics with its own complexities

Free Riders?

- Are tokens and contracts value additive to the underlying cryptocurrency!?
- Today, most are parasitic
- However, they drive speculation, so it has worked out OK for Ethereum
- Could contracts ever cause significant problems for the base chain?
    - For example, trading on hash rates

Crypto Corporations

- MKR as buyer of last resort in Dai stablecoin system
- BNB operating a buy-and-burn with a % of company revenues
- CoinFlex:
    - The coin is issued to traders who provide liquidity on the exchange
    - % of revenues used in buy-and-burn
    - As coin value rises, liquidity rises, buy-and-burn rises, increasing buyer interest

Company Coins

- These “protocols” are simply company constructions
- However, the company is the #1 holder! Most skin-in-the-game.
- Is that enough incentive alignment to know the rules won’t be broken?
    - Is this all priced in?
- Will we have Gameplay Mining, Content Mining, Driver Mining??

Company Coins

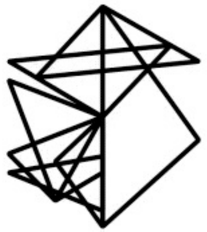
- Coins like BNB, MKR, and FLEX **rely** on the value of base blockchains
- However these coins are not purely speculative - the value is “Real”
- So we need to bootstrap money in order to have corporations
    - Just like IRL!

Longer Term

- The project is to replace all money with internet money
- Then, replace all financial services with smart contracts
- Could smart contracts guide even more complicated systems?
    - Taxation, Voting, Global Resource Allocation

Thanks!*

*We are hiring



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