DISCUSSION OF:
A MODEL OF THE OPTIMAL SELECTION
OF CRYPTO ASSETS

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Discussion by: Andreas Park

November 14, 2019

2019 Philadelphia Fed FinTech Conference
CRYPTO ASSETS: LIVE ON A DISTRIBUTED LEDGER/BLOCKCHAIN
• What is a blockchain?
• A "joint, single system"
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• Features:
  ▪ secure storage of information and transfer of value
  ▪ guaranteed execution of code
What is a blockchain?
A "joint, single system"
Features:
- secure storage of information and transfer of value
- guaranteed execution of code
Promise:
- open platform
- global reach
- low friction, automatable finance
Microsoft To Help Enterprises Mint Their Own Ethereum Tokens

from Forbes

Microsoft to Help Enterprises Mint Their Own Ethereum Tokens

Azure Blockchain Tokens [...] lets enterprises, or anyone really, design, issue and manage a wide range of assets.

Currently, the platform is a permissioned version of the ethereum blockchain that uses Microsoft’s Azure cloud computing.

In the future Azure Blockchain Tokens will interact with the public Ethereum blockchain or even at distributed ledgers created by some of Microsoft’s own competitors.

THREE FALLACIES FOR CRYPTO-ASSETS
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CRYPTO ENTITIES = TRADITIONAL FIRMS
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CRYPTO TRADING = TRADITIONAL TRADING
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CRYPTO TRADING = TRADITIONAL TRADING

CRYPTO ASSETS = TRADITIONAL SECURITIES
WHAT IS A CRYPTO ASSET?
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Technology
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Technology

- Security
- Throughput
- Functionality
- Compatibility
WHAT IS AN ASSET?

- Technology
- Legal/Regulation
- Accounting
- Economic functions
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- Property/Ownership rights
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Accounting
- Cash flows
- Contingencies

Economic functions
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Economic functions

- state-dependent utility
- incentives
- externalities
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- incentives
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DIMENSIONS OF IMPORTANCE FOR CLASSIFICATION

Governance (Stability)

Security

Mount Gox

Fort Knox

flaky

reliable

3.2
DIMENSIONS OF IMPORTANCE FOR CLASSIFICATION

Governance (Stability)

Security

Fort Knox

Mount Gox

reliable

flaky

FED COINS

3.2
DIMENSIONS OF IMPORTANCE FOR CLASSIFICATION

Governance (Stability)

- Governance: Fort Knox, Mount Gox
- Security: flaky to reliable

- Reliable: FED COINS
- Flaky: STABLE COINS

3.2
DIMENSIONS OF IMPORTANCE FOR CLASSIFICATION

- Governance (Stability)
  - Reliable
  - Flaky

- Security
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  - Mount Gox

3.2

- FED COINS
- STABLE COINS
- UTILITY TOKENS
DIMENSIONS OF IMPORTANCE FOR CLASSIFICATION

Governance (Stability)

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flaky

| reliable |
|----------|----------|
| Governance (Stability) |
DIMENSIONS OF IMPORTANCE FOR CLASSIFICATION

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- flaky
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Security

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CRYPTO CURRENCIES

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DIMENSIONS OF IMPORTANCE: DECENTRALIZATION?

- Governance
- Security

- Fort Knox
- Mount Gox

- CRYPTO CURRENCIES
- FED COINS
- UTILITY TOKENS
- STABLE COINS

- decentralized
- centralized
DIMENSIONS OF IMPORTANCE: DECENTRALIZATION?

Governance

Security

Fort Knox

Mount Gox

decentralized

centralized

CRYPTO CURRENCIES

FED COINS

UTILITY TOKENS

STABLE COINS

UTILITY TOKENS
DIMENSIONS OF IMPORTANCE: DECENTRALIZATION?

Governance

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CENTRALIZED

DECENTRALIZED

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DIMENSIONS OF IMPORTANCE: DECENTRALIZATION?

- **Governance**: centralized, decentralized
- **Security**: Fort Knox, Mount Gox
- **Utility Tokens**: CRYPTO CURRENCIES, FED COINS, STABLE COINS, UTILITY TOKENS
DIMENSIONS OF IMPORTANCE: CENSORSHIP RESISTANCE (FOR CYPHERPUNKS)

Governance

decentralized  centralized
DIMENSIONS OF IMPORTANCE: CENSORSHIP RESISTANCE (FOR CYPHERPUNKS)

Censorship Resistance

censoring impossible
censoring desirable
decentralized
centralized

Governance

FED COINS
DIMENSIONS OF IMPORTANCE: CENSORSHIP RESISTANCE (FOR CYPHERPUNKS)

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CRYPTO CURRENCIES

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DIMENSIONS OF IMPORTANCE: CENSORSHIP RESISTANCE (FOR CYPHERPUNKS)

- Governance
  - Censorship
    - Censoring impossible
    - Censoring desirable
  - Resistance
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    - Centralized

- CRYPTO CURRENCIES
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- FED COINS
TO ASSESS CRYPTO-ASSETS AS INVESTMENTS WE MUST UNDERSTAND THEIR ECONOMICS
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Economic function
- some examples -
TO ASSESS CRYPTO-ASSETS AS INVESTMENTS WE MUST UNDERSTAND THEIR ECONOMICS

Economic function
- some examples -

- Which incentives do they provide to issuers and users?
- What externalities do they create among users?
- Which state-dependent utility do they yield?
Native to a blockchain for payment: examples include Bitcoin, Bitcoin Cash, Ether, Lumens, and Cardano.

Build on top of or linked to an existing blockchain for various uses, not just payments. They can use blockchain natively or as payment and settlement tech.

A taxonomy by on- vs. off-chain:

**On-Chain Link**
- Cryptocurrency
- **Utility/Payment**
  - native to a blockchain for payment
  - examples: Bitcoin, Bitcoin Cash, Ether, Lumens, Cardano

**Off-Chain Link**
- CBDC
- Stablecoin
- Equity/Debt
- Derivatives

Blockchain is a value transfer infrastructure and may use CBDC or Stablecoin in payments/transfers.

Claims to revenues, cash flows, assets (e.g., real estate)
HOW CAN WE CLASSIFY CRYPTO ASSETS?
A TAXONOMY BY ON- VS. OFF-CHAIN

ON-CHAIN LINK

CRYPTOCURRENCY

- native to a blockchain for payment
- examples: Bitcoin, Bitcoin Cash, Ether, Lumens, Cardano

UTILITY/PAYMENT

- build on top of or linked to an existing blockchain
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OFF-CHAIN LINK

CBDC

STABLECOIN

EQUITY/DEBT

DERIVATIVES

Blockchain is a value transfer infrastructure
- claims to revenues, cash flows, assets (e.g. real estate)
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OLD WORLD, NEW INFRASTRUCTURE
Native to a blockchain for payment
- examples: Bitcoin, Bitcoin Cash, Ether, Lumens, Cardano

Build on top of or linked to an existing blockchain
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**Old World, New Infrastructure**

**ON-CHAIN LINK**

**OFF-CHAIN LINK**

**CBDC**

**STABLECOIN**

**EQUITY/DEBT**

**DERIVATIVES**

**Questions**

**Many Open Economic Design Questions**
How can we classify crypto assets? A taxonomy by on- vs. off-chain

Many open economic design questions

- native to a blockchain for payment
- examples: Bitcoin, Bitcoin Cash, Ether, Lumens, Cardano

Possibly transformative for business & finance

- could use blockchain natively or as payment and settlement tech

Blockchain is a value transfer infrastructure

- claims to revenues, cash flows, assets (e.g., real estate)
- may use CBDC or Stablecoin in payments/transfers

Old world, new infrastructure
### HOW CAN WE CLASSIFY CRYPTO ASSETS?

A TAXONOMY BY LOCATION IN THE BLOCKCHAIN TECH STACK

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**CryptoCurrency**
## How can we classify crypto assets?

A taxonomy by location in the blockchain tech stack

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NEXT FEATURE OF THE MODEL: THE SELECTION "APP"
Traditional Portfolio Theory

- collect information about assets' features such as expected returns and risks
- combine assets in a portfolio so as to maximize expected utility
- investors are price takers
- usually: $1 = E[mR]$ or $p = E[mx]$
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Investment Approach in Paper

- sequence of pairwise comparisons of assets (similar to first application of Facebook as per "The Social Network")
- investors iteratively pick preferred asset
- aggregate choices determine returns
- changes to investment get assessed based on expected returns alone
In paper, utility is represented as weights in the acceptance probability

\[ P(a_i \rightarrow \tilde{a}_i, a_j \rightarrow \tilde{a}_j) = \frac{1}{(1 + \beta_0 \Delta R_{\text{tot}})(1 + \beta_1 \Delta s)(1 + \beta_2 \Delta \xi)}, \]
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• How does this formulation relate to standard economic models?
• Is it a representation with known properties of utility functions (transitivity etc)?
• Is the model a reduced form representation of a more standard economic model?
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- Won't investors end up with single-asset portfolio? Or will there be diversification?

- Is this meant to be a model or a proposal for a commercial product?
There are by now a lot of papers that study crypto-assets like normal assets. BUT: Do we really understand their economic functionality?

This paper: step in the direction of understanding crypto-assets as investments.

My preference: anchor assumptions in primitives:

- What features of crypto-assets give rise to "stability" and how does it affect payoffs?
- How do features of "security" affect payoffs?
- What type of preferences support the binary-choice equilibrium?
@financeUTM

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slides.com/ap248

youtube.com/user/andreaspark2812/

sites.google.com/site/parkandreas/