

TOKEN-BASED PLATFORM FINANCE
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WHAT IS A PLATFORM?

- Unique marketplace for certain transactions
- Consumers demand token for convenience yield
- Platform owner manages token supply
 - Can issue new tokens
 - “Burn” existing ones (tokens’ signatures placed into an irretrievable public wallet, visible by all nodes)
- Owner’s value is the discounted value of all tokens sales net of the buyback costs
- External contributors can increase the platform’s usefulness

BUILDING BLOCKS AND INNOVATIONS

- **Quality** (new) depends on contributors' investment L and productivity shocks H

$$\frac{dA_t}{A_t} = L_t dH_t$$

- **Contributors** (new): decisions are in reduced form: in exchange for L_t , they require nominal token transfer equal to

$$F(L_t, A_t)$$

- **Users:** problem based on CLW 2018. Select holdings k to maximize utility

$$(P_t k_{i,t})^{1-\alpha} (N_t^\gamma A_t u_i)^\alpha dt : \text{convenience yield}$$

$$k_{i,t} \mathbb{E}_t [dP_t] : \text{capital gain}$$

$$\phi dt : \text{flow cost}$$

$$P_t k_{i,t} r dt : \text{financing cost}$$

BUILDING BLOCKS AND INNOVATIONS (2)

- Owner (new)

$$\max_{\{L_t, D_t\}} \int_{t=0:\infty} \mathbb{E} \left[e^{-rt} P_t dD_t [1_{dD_t > 0} + 1_{dD_t < 0} (1 + \chi)] \right]$$

- Endogenous monetary policy (new)

$$dM_t = \underbrace{\frac{F(L_t, A_t)}{P_t} dt}_{\text{token-based productivity financing}} + \underbrace{dD_t}_{\text{seignorage}}$$

- Supply increase #1: self rewards (inflation tax)
- Supply increase #2: compensation to contributors (tax, but increases productivity)
- Decrease: token burning (negative tax)

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- Supply increase #1: self rewards (inflation tax)
- Supply increase #2: compensation to contributors (tax, but increases productivity)
- Decrease: token burning (negative tax)
- Nice! in a single framework: dynamics of user adoption; corporate finance decisions by platforms (investment, financing, payout policies); and prices

- 1 Interpretation: Theory vs. Industry
- 2 Blockchain and commitment
- 3 Thoughts on alleviating frictions

How should we best view the contribution?

- Positive description of what platforms do?
- “Normative” proposal on how a platform should be designed?

POSITIVE DESCRIPTION? FINANCING FOR BIGGEST DECENTRALIZED PLATFORMS

TABLE: Financing Models

Platform	Founders earnings	ICO dates	Discretionary supply management (payouts/buybacks)
Ethereum	ICO	Jul to Aug '14	no
EOS	ICO	Jun '17 to Jun '18	no
NEO	ICO	Sep '15 to Sep '16	no
Cardano	ICO	Jan '15 to Jan '17	no
Tron	ICO	Sep '17	no

- Some founders (e.g., NEO) hold large stock of noncirculating supply for skin in the game

WHY PLATFORMS FOLLOW A DIFFERENT MODEL? A FEW CONJECTURES

- Trust and cognition limits

- Discretionary monetary policy creates serious trust issues and fear of scams
- Paper addresses these issues in the general equilibrium
- But arguably quite demanding on agent's cognition abilities, required common knowledge of many hard-to-grasp parameters, etc.

- Time to build

- In the model, *users* derive utility “right away,” as long as $A \times N > 0$. Can demand token even when speculative motive is weak
- In reality, many years can go by from launching to useful applications
- In the interim, those providing funds are *speculators*, who could be relatively more sensitive to supply uncertainty

“NORMATIVE” INTERPRETATION

- Many analyses of ICO financing either
 - Implicitly assume supply commitment (“blockchain technology”)
 - Argue that lack of commitment prevents investment (except with irrational users or scams)
- CLW show how a self-regulated monetary policy is incentive compatible in a dynamic setting
- Best of all, it has important advantages over ICO model
 - Future payouts = incentives to invest wisely in the platform
 - Contributes to token price stability
- Related to Coasian duropolist, but results are new, environment is quite different

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- **Plausible explanation for over-reliance on ICO model is simply that these results were not known**

COMMENT: BLOCKCHAIN AS COMMITMENT DEVICE

- The premise is that “blockchain technology” allows token supply rules to be immune to adjustments after the launching of the platform.
- Authors consider investment commitment linked to a constant supply growth rule

$$\frac{F(L_t, A_t)}{P_t} dt = \mu^M M_t dt$$

- Cool theoretical result: mitigates under-investment problem but induces more frequent. Positive value effect on the net

COMMENT: BLOCKCHAIN AS COMMITMENT DEVICE

- Is the premise reasonable? It's debatable
 - In open blockchains, protocol features are determined by social dynamics, they are not embedded in the technology
 - Participants' decisions on software to run, soft and hard forks...
 - Examples: Ethereum hard fork reversal (ETH vs. ETC) after DAO event. Bitcoin protocol disagreements: BTC, BCH, BTG, BSV,...
- CLW propose a hybrid of commitment and discretion. Interesting, but feasible?
 - "built-in backdoor": If the owner has the ability to discretionally change supply for reason A, what prevents changes for reason B?
 - Huge oracle and moral hazard problems with automatic payments to contributors (\neq PoW mining, which is a tournament)

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- **More palatable variant for Section 5:** Protocol-driven founder rewards: $dD_t = \mu^D M_t dt$ (ZCash). Founder/owner can use own funds to, upon verification, incentive developers (EOS, NEO,...)

COMMENT. ALLEVIATING FINANCING FRICTIONS: SAVINGS

Costly External Financing. Can we rely more on internal funds?

Allowing the owner to save

- 1 Precautionary Cash.** Combining token supply management with precautionary cash balance (e.g., from ICO proceeds). Raising external funds arguably more costly than the opportunity cost of cash balances
- 2 “Platform reserves” token account**
 - Owner can increase or decrease balance to influence price without necessarily changing *circulating* supply (akin to pricing managers' warrants)
 - Still might need external resources if the balance is depleted, but would lower the frequency of actual buybacks

COMMENT. ALLEVIATING FINANCING FRICTIONS: USERS

Token overhang. Can the platform “tax” users differently from inflation?

- 1 Productivity-linked user fees.** Unlikely to lead to first-best allocation, but could help to alleviate the cost-benefit gap the owner faces
- 2 Productivity-linked user dividends.** Some platforms pay holders dividends. These could decrease when investment is required, creating redistribution from users to contributors
- 3 Contributors charging users.** Possible if we interpret contributions as developing applications (e.g., Dapps on Ethereum)

CONCLUSIONS

- First-order contribution building on authors' prior work
- Likely to become standard framework for token finance and I.O. analyses
- I expect insights to percolate and influence industry discussions

