

Digital Money and Finance: What's New?

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The question

- ▶ “Do we need to rethink money, banking and finance? Or do conventional theories apply?”
- ▶ My answer: both
- ▶ Digital innovation is raising many new issues/questions
 - ▶ what determines the value of something like bitcoin?
 - ▶ should stablecoins be regulated? how?
 - ▶ should central banks issue digital currency? With what features?
- ▶ A narrow interpretation of Dirk’s question:
 - ▶ do we already know the answers?
 - ▶ is it just a matter of finding the right book or article?
- ▶ I think we clearly do not know the answers; much work is needed

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- ▶ A broader interpretation of Dirk's question:
 - ▶ do we need a complete rethink?
 - ▶ do we need design a new "digital economics" and "digital finance" that applies to this new digital economy?"
 - ▶ I would argue: no
 - ▶ Digital money and finance is largely about finding new ways of solving fundamental economic problems
 - ▶ examples: how to transfer ownership of assets (including money)
 - ▶ how to provide liquidity while financing investment, etc.
 - ▶ Existing theories and models focus on these fundamental problems
 - ▶ provide a solid foundation for answering new questions
 - ▶ Let me give three illustrative examples
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1) Bitcoin

- ▶ In some ways, Bitcoin is quite revolutionary
 - ▶ an asset not backed by anything or anyone; ownership can be transferred in a decentralized way

Q: What determines the value of such an asset?

- ▶ much work in monetary economics on exactly this question
- ▶ [Diamond \(1965\)](#) provides answers in a particular environment
 - ▶ interpretation of the asset: govt debt → currency → bitcoin?
 - ▶ subsequent literature: value of a “bubble” asset is fragile, can collapse, exhibit sentiment-driven volatility ([Shell, 1977](#); [Azariadis 1981](#))
 - ▶ exchange rates between two assets are indeterminate ([Karaken & Wallace, 1981](#)), can be highly volatile ([Manuelli & Peck, 1990](#))
- ▶ Models where asset is a medium of exchange show similar results
 - ▶ literature following [Kiyotaki & Wright \(1989\)](#), [Lagos & Wright \(2005\)](#)

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- ▶ The recent crypto-related literature builds on these insights
 - ▶ [Garratt and Wallace \(2018\)](#): OLG model to study bitcoin pricing
 - ▶ [Schilling and Uhlig \(2019\)](#) study the “exchange rate” between bitcoin and the dollar (say)
 - ▶ also: Choi & Rocheteau ([2021](#), [2022](#)), [Biais et al \(forthcoming\)](#), others
 - ▶ There are new elements in these models
 - ▶ ex: bitcoin is produced by miners who face costs, incentives
 - ▶ Point: at a fundamental level, bitcoin has familiar features
 - ▶ The literature that has studied these features in general settings:
 - ▶ provides insights that also apply in the environment
 - ▶ has proved to be a useful foundation for future research
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2) Stablecoins

- ▶ Aim to provide a widely-accepted, blockchain-native form of money
 - ▶ in the process, perform maturity transformation (like banks, MMFs, etc.)

Q: How stable is the value of these coins?

- ▶ how can they be designed to maximize their usefulness ...
- ▶ and to avoid bad outcomes (self-fulfilling runs, collapse)?
- ▶ [Green and Lin \(2003\)](#) studied a version of the Diamond-Dybvig model of maturity transformation by banks
 - ▶ very explicit about information, feasibility and incentive constraints
 - ▶ result: following the efficient rule insulates a bank from self-fulfilling runs
 - ▶ this rule is complicated; value of a deposit adjusts dynamically
- ▶ Paper was criticized as being unrealistic
 - ▶ value of a dollar in the bank is fixed, not adjusting dynamically

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- ▶ The value of a stablecoin *does* change with market conditions
 - ▶ model in Green-Lin is closer to a crypto coin than a traditional bank
 - ▶ [Routledge & Zetlin-Jones \(2022\)](#) JEDC Special Issue:
[The Economics of Digital Currencies](#)
 - ▶ modify the Green-Lin approach to study stablecoin design
 - ▶ implement their coin using smart contracts on Ethereum
 - ▶ Show: for a coin to be stable in a global sense ... (no self-fulfilling runs)
 - ▶ ...value needs to vary with demand; not perfectly stable in a local sense
 - ▶ [Huang \(2022\)](#)
 - ▶ because stablecoins are on chain, transaction history is public
 - q: how does that affect stability of the coin?
 - ▶ modifies the information structure in the Green-Lin model
 - ▶ shows: this feature can help stabilize the coin; prevent runs
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The point (again):

- ▶ Existing models of fundamental economics issues and tradeoffs ...
 - ▶ such as Green & Lin, others on maturity transformation
- ▶ ... are providing a solid foundation for understanding the new, digital incarnations of these issues

3) CBDC

- ▶ Should central banks issue digital currency?
 - ▶ lots of discussion; many issues to consider
- ▶ One issue: public money (CBDC) might crowd out privately-created money (bank deposits)
 - ▶ with implications for funding costs, investment, etc.
- ▶ Echoes a classic question in monetary economics: What is the optimal mix of *inside* and *outside* money?
 - ▶ Daniel Sanches and I were working on this issue ("[Aggregate Liquidity Management](#)" 2016) ...
 - ▶ building on [Lagos and Rocheteau \(2008\)](#), others
 - ▶ ... when we realized a CBDC would raise exactly this type of question
 - ▶ result: "[Should central banks issue digital currency?](#)" (forthcoming)

Summary

- ▶ The digital transformation is raising new questions
 - ▶ including some pressing policy and regulatory concerns
 - ▶ there is much work to be done in providing answers
- ▶ But we do not need to start from scratch
- ▶ Digital money and finance are attempts to find new solutions to longstanding economic problems
 - ▶ as such, we are seeing familiar issues and familiar tradeoffs ...
 - ▶ ... arising in new settings
- ▶ To address these questions, we can build on a body of fundamental research that has been done over the years.