FINTECH AND DECENTRALIZED FINANCE: MASTERCLASS

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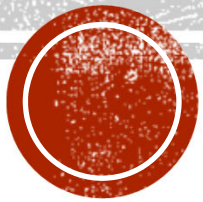


WHARTON GLOBAL FORUM
SINGAPORE, MARCH 2023

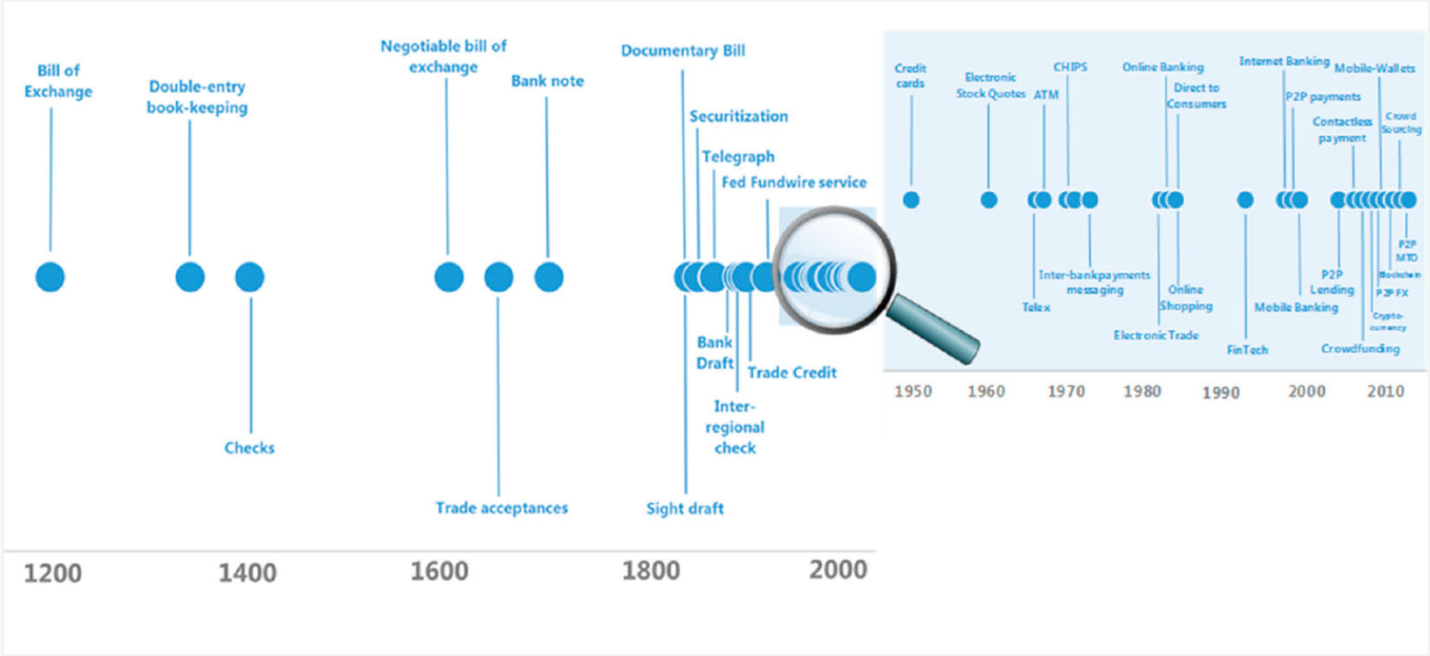
OUTLINE

- **FinTech and Decentralization**
- **Lessons from Peer-to-Peer and FinTech Lending**
- **The Promise and Challenges of Blockchain and DeFi**
- **Conclusion**

FINTECH AND DECENTRALIZATION

TECHNOLOGY AND FINANCE

- Technology has always influenced the way the financial industry operates



Sources: Arner, Barberis, and Buckley (forthcoming); Quinn and Roberds (2008); World Economic Forum (2015).

A FINTECH REVOLUTION?

- What is so special about the recent FinTech revolution?
- Two Observations:
  - The pace at which new technologies are tested and introduced into finance is faster than ever before
  - Much of the change is happening from outside the financial industry, as young start-up firms and big established technology firms are attempting to disrupt the incumbents

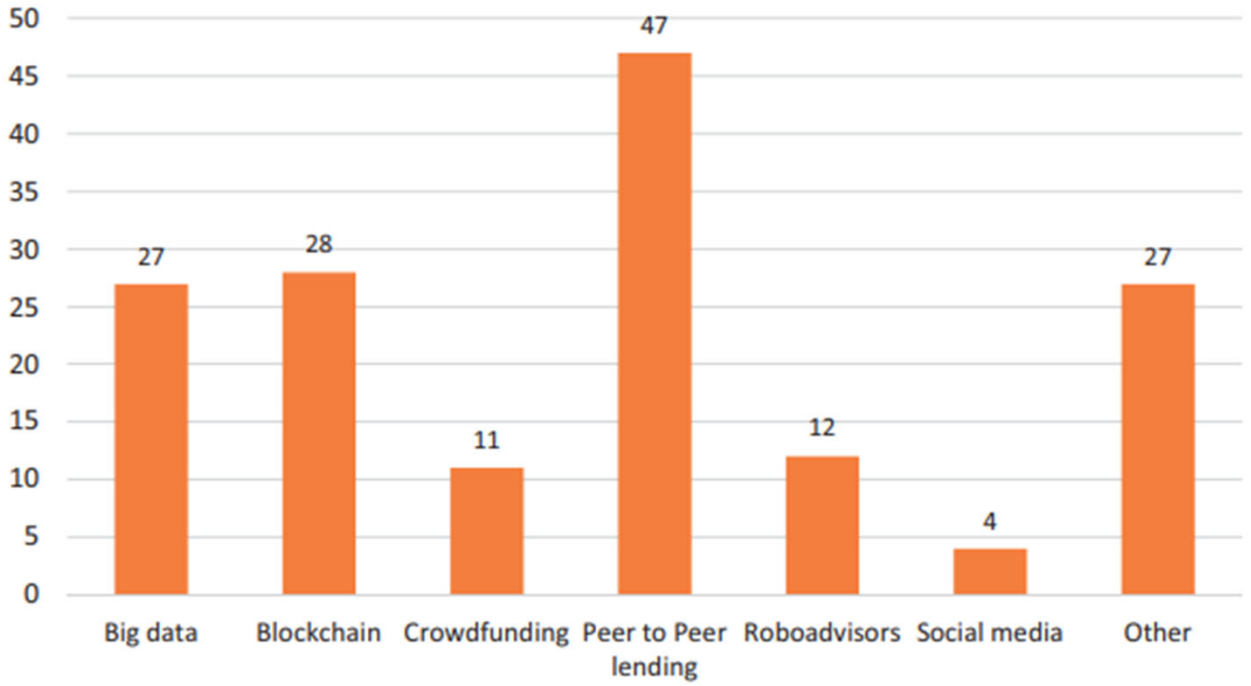
A GLIMPSE INTO ACADEMIC RESEARCH

- A FinTech initiative launched in 2016 at the *Review of Financial Studies* solicited research proposals on the emerging field of FinTech
  - A first-of-its-kind initiative, both in topic and editorial process
    - Academic research on the topic was very scarce
    - Asking scholars to propose future research
  - A crowdsourcing view on what FinTech is about
  - Special issue "To FinTech and Beyond" published in 2019

WHAT IS FINTECH? A WORD CLOUD FROM RESEARCH PROPOSALS

Source: Goldstein, Jiang, and Karolyi (2019)

WHAT IS FINTECH? TOPICS OF RESEARCH PROPOSALS



Source: Goldstein, Jiang, and Karolyi (2019)

AN EMERGING UNIFYING THEME: DECENTRALIZATION

- Decentralization is a key premise
- Traditional finance features central players, such as financial intermediaries and governments who facilitate transactions and recordkeeping
- Decentralization aims to give rise to a process that will not rely on these big players
- Motivation for decentralization was strengthened in the aftermath of the global financial crisis and the distrust in central players that followed it
- Decentralization can be enabled by technology

THE PROMISE OF DECENTRALIZATION

- Decentralized process alleviates the systemic risk from the failure of a central player
  - For example, a central counterparty (CCP) or a central computer system
- Decentralized process eliminates market power and rent extraction by large intermediaries
  - Key concern in finance due to the excessive power of large intermediaries
- Decentralized process may enable more efficient trading of a large variety of assets
  - Many assets are traded inefficiently with large frictions in traditional financial systems, e.g., corporate bonds
  - With new technologies, trading of non-traditional assets can be more easily enabled, e.g., artwork

11

LESSONS FROM PEER-TO-PEER AND FINTECH LENDING

LESSONS FROM PEER-TO-PEER LENDING

- Peer-to-peer lending was based on a powerful idea:
  - Instead of relying on banks as intermediaries, form an online market where lenders directly match with borrowers
  - Eliminate rents of big intermediaries and give better deals to the ultimate lenders and borrowers
  - Dominant US players: LendingClub and Prosper
- Ultimately, this model did not live up to the expectations:
  - Big intermediaries took over and now retail investors do not participate
  - The evolution of peer-to-peer lending demonstrates the challenges with decentralization

LIMITED SCOPE OF DECENTRALIZATION: THE CASE OF PEER-TO-PEER LENDING

- Why did large investors end up dominating marketplace lending platforms and reversing the peer-to-peer lending model?
  - Financial intermediation holds key advantages that brought intermediaries to prominence to begin with
    - Informational advantage and screening capacity
    - Ability of monitoring borrowers
    - Liquidity transformation and risk sharing
  - These traditional forces are still relevant today, putting retail investors at disadvantage
- Despite the fall of peer-to-peer lending, FinTech lending has been rising in other forms, not as decentralized

SNAPSHOT OF FINTECH LENDING IN US

A: Size of entire lending market (outstanding volumes)			
Segment	**Source(s)**	**Q4/2020 (USD billion)**	**Growth per annum 2016–2020**
Mortgage loans	Fed. Reserve (2022b)	16,781	4.0%
Consumer credit	Board Gov. Fed. Reserve Syst. (2022)	4,186	3.6%
Commercial and industrial loans	Fed. Reserve (2022a)	2,600	5.7%
B: Estimates of FinTech lending (new lending)			
Segment	**Source(s)**	**2020 (USD billion)**	**Growth per annum 2016–2020**
FinTech mortgage lending	Jagtiani, Lambie-Hanson & Lambie-Hanson (2021); authors' calculations based on Home Mortgage Disclosure Act (HMDA) filings	565	32.5%[a]
FinTech consumer lending	Ziegler et al. (2021)	38	11.9%
FinTech business lending	Ziegler et al. (2021)	31	43.1%
C: FinTech lending for subsegments and major players (new lending)			
Segment	**Source(s)**	**2020 (USD billion)**	**Growth per annum 2016–2020**
Rocket Mortgage (formerly Quicken Loans)	Rocket Co. (2020)	320	35%
Secured non-real estate commercial and industrial loans by FinTech lenders	Gopal & Schnabl (2021); authors' calculations based on Uniform Commercial Code filings	11	11%
LendingClub	LendingClub (2017); US Sec. Exch. Comm. (2020a)	4	−16%
Prosper	US Sec. Exch. Comm. (2016)	2	−9%
Buy-now-pay-later: Afterpay, Klarna, and Affirm combined	Afterpay (2021); Klarna (2021); US Sec. Exch. Comm. (2020b)[b]	25	>100%

Source: Berg, Fuster, and Puri (2022)

FACTORS BEHIND SUCCESS OF FINTECH LENDING

- Technology enables convenience
  - Faster processing times and improved user experience
- Lenders are subject to less regulation
  - FinTech lenders are non-banks and thus are not subject to many of the constraints that banks face
- Innovation brings new products
  - For example, Buy-Now-Pay-Later
- Reliance on Big Data
  - New types of data and higher capacity for data processing enable more lending
- Is FinTech Lending beneficial overall?
  - Evidence is mixed
  - On the one hand, we see more elastic credit supply
  - On the other hand, some evidence of overborrowing by naïve consumers
  - In any case, this is not a decentralization revolution

16

THE PROMISE AND CHALLENGES OF BLOCKCHAIN AND DEFI

NEW FRONTIER OF DECENTRALIZATION: BLOCKCHAIN

- Blockchain is a Distributed Ledger Technology
  - Transactions happen in a decentralized way
  - Consensus evolves without any centralized recordkeeping
  - Information is shared by all
  - Bitcoin was the first, and is still the most famous, application
- The viability of the blockchain depends on the protocols for validation of transactions
  - Proof of Work (PoW)
    - Validators (miners) compete by solving a complex computational problem for the right to validate
    - This involves major costs of energy
  - Proof of Stake (PoS)
    - Validators need to stake coins in order to validate
    - The main advantage is avoiding the energy costs

NEW FRONTIER OF DECENTRALIZATION: SMART CONTRACTS AND DEFI

- Smart contracts are applications built on top of a blockchain
  - They extend the use of the technology beyond simple transfers
  - These are promises that are executed automatically based on the original design
- Decentralized Finance (DeFi) is a collection of smart contracts on a blockchain
  - It is meant to create a new financial architecture that will replace the traditional financial system (TradFi)
  - The key difference between DeFi and TradFi is that the former avoids the reliance on intermediaries, which is so central in the latter
  - Ethereum is the best-known example of a DeFi blockchain

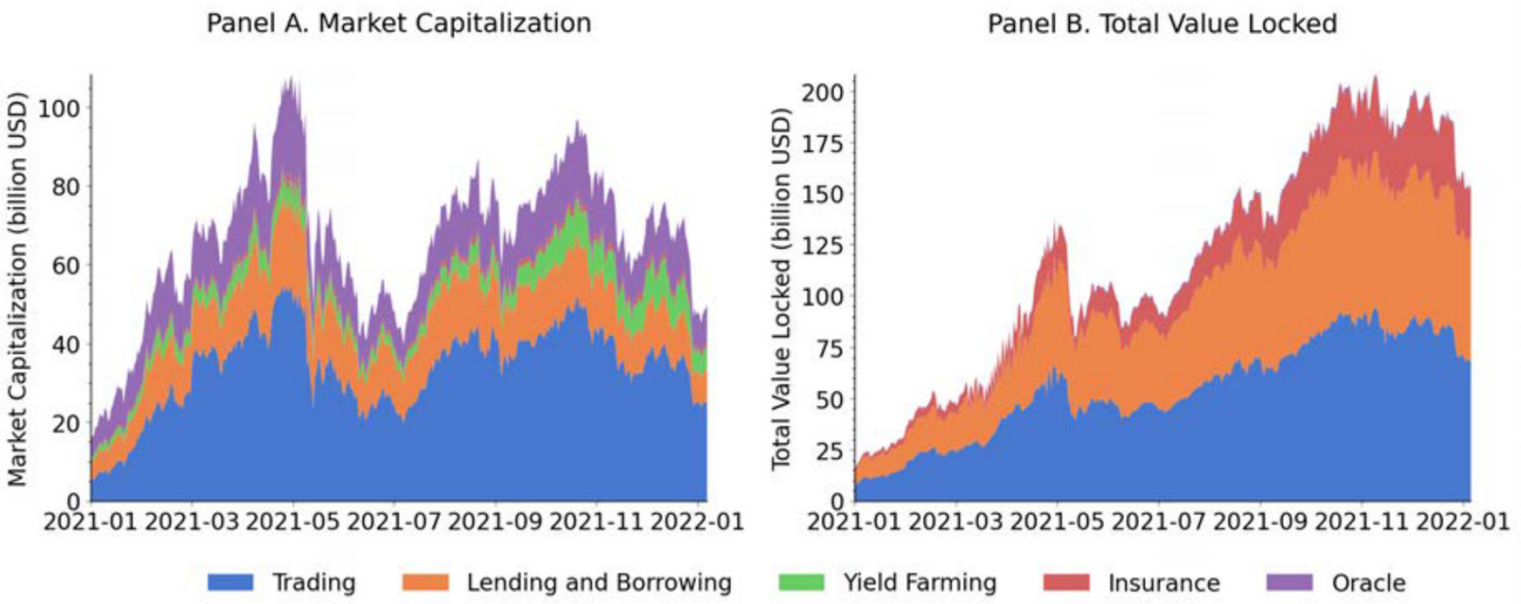
USES: CRYPTOCURRENCIES AND TOKENS

- Cryptocurrencies:
  - Coins that are meant to serve as money and replace government-sponsored money
  - Most notably, Bitcoin, but many others as well
  - Major challenges in making them suitable as a medium for payment
- Tokens:
  - Coins issued for use on a platform to purchase services on the platform
  - For example, Ether used on the general Ethereum platform, or Filecoin used on specific platform to rent unused hard drive space
  - Initial Coin Offering (ICO) boom came to a halt due to large volume of fraudulent activity

USES: LEADING DEFI APPLICATIONS

- The system enables various financial activities mimicking the traditional financial system
- At this point, this is mostly in the proof-of-concept stage and still highly self-referential
- Current key applications:
  - Trading:
    - Decentralized Exchanges (DEX) using automated market makers (AMM) protocols to exchange different coins
  - Lending and Borrowing:
    - Lending protocols designed to borrow one coin, using another coin as collateral; these loans are typically over-collateralized
  - Yield Farming:
    - Smart contracts that aim to maximize returns on coins by allocating them across different applications

DEFI APPLICATIONS: VALUE INVOLVED

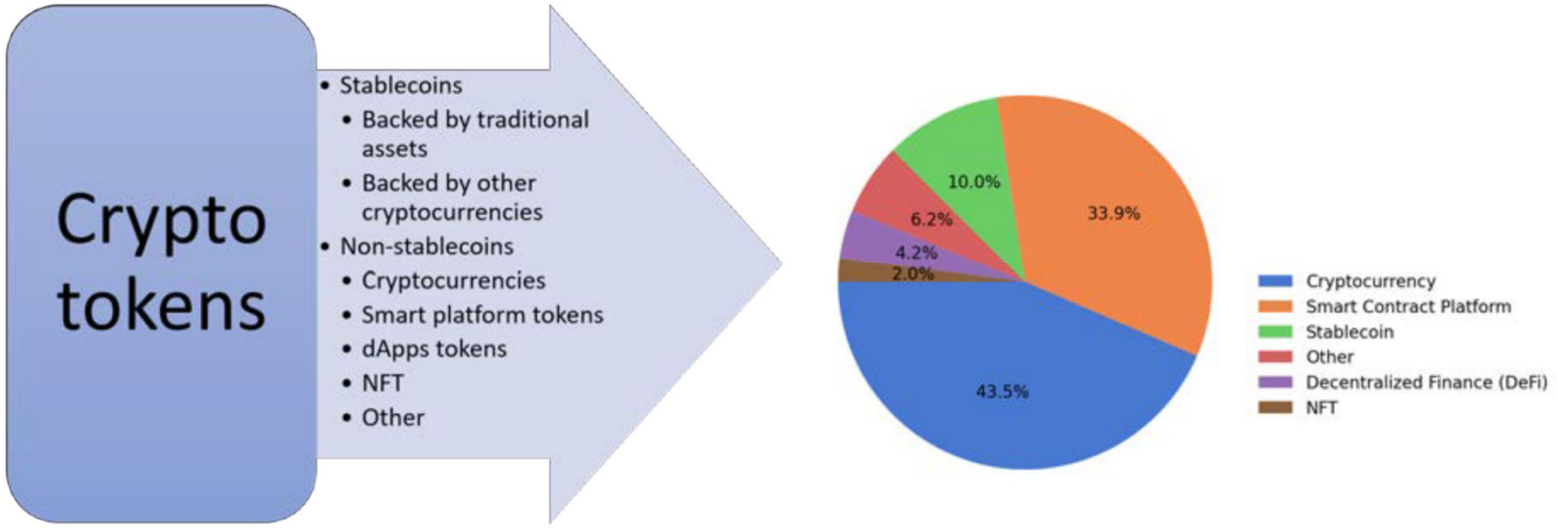


Source: Makarov and Schoar (2022)

USES: STABLECOINS

- Stablecoins are digital currencies designed to maintain a peg to fiat-currencies
  - Because of the volatility of cryptocurrencies, there is demand for a stable currency in the digital world
- Two types of stablecoins:
  - Stablecoins backed by traditional liquid and safe assets – Tether and USD Coin
  - Algorithmic stablecoins backed by other cryptocurrencies – Terra and Dai
- Stablecoins' value proposition comes from their stability but there are concerns about runs, which are well known from the traditional financial system
  - Terra's recent collapse was a clear illustration of that
  - Concerns arise also with stablecoins backed by traditional assets, as there is ambiguity about the value and stability of these assets

THE LANDSCAPE OF TOKENS



Source: Makarov and Schoar (2022)

LIMITS OF DECENTRALIZATION

- Experience with peer-to-peer lending shows that financial intermediaries can end up dominating the new technologies
  - Building on traditional advantages of intermediation
- Various forces in blockchain economics also push back to concentration
  - Experience with PoW protocol clearly showed that there are returns to scale, leading to:
    - Mining pools
    - Large investment in equipment
    - Interactions with blockchain governance
  - In theory, PoS might be prone to such issues:
    - The right to validate a transaction is tied to the stake a validator holds in the coin

BLOCKCHAIN OPERATIONAL CHALLENGES

- As protocols for validation are practiced and tested, problems arise in consensus generation and operability
  - PoW is still most widely used
    - Energy costs make this protocol unviable
    - Strategies of validators can lead to adverse outcomes, such as coordination problems and forks
  - PoS is only now becoming more prominent, and challenges might arise
- Blockchain impossibility triangle
  - A well-known theory suggests that blockchain can achieve only two out of the three objectives:
    - Consensus
    - Decentralization
    - Scalability

BLOCKCHAIN TRUST AND LEGAL CHALLENGES

- The experience with blockchain applications thus far has led many to believe that they are non-credible and that they are tied to illicit activities
  - Volatility of Bitcoin and other cryptocurrencies prices
  - Large volume of fraudulent ICOs
  - Hard-to-justify prices for Non-Fungible Tokens (NFTs)
  - Collapse of Terra stablecoin
  - Highly visible failure of FTX
- Legal and regulatory framework continues to be in flux
  - Rules to address suspicious financial transactions clash with blockchain anonymity and decentralization
  - Uncertainty about legal status of coins and whether they should be treated as securities
  - Different countries are adopting different solutions amplifying the uncertainty and confusion

CONCLUSION

CONCLUSION

- There is a big push to create a new financial system based on decentralization
- The idea of decentralized finance has a lot of positive aspects, but the forces for centralization and intermediation are strong
- A realistic middle ground is one where intermediaries continue to play a role, but some of the benefits of the technologies are still achieved: ***Partial decentralization***
- There are still many other obstacles on the way to this equilibrium