

FinTec, Digital Currency and Blockchains

Visiting Prof. David Yermack, New York University

13-15 and 18-22 July, 09:30 – 12:00

Overview

Recently Bloomberg summarized a new research report issued by McKinsey & Co:

Firing people won't be enough to save the world's biggest banks from technological and regulatory changes that have reshaped the industry - whole businesses must go, according to McKinsey & Co. Almost every bank will have to quash aspirations to be all things to all customers . . . Only three to five global full-service banks will survive, McKinsey said.

This course covers digital currencies, blockchains, and related topics in the FinTech area, perhaps the most significant innovation in the financial world since the advent of double-entry bookkeeping centuries ago. The technology appears to represent an existential challenge for major parts of the finance industry. It is now commonly suggested by experts such as McKinsey that commercial banks and stock exchanges may no longer exist, or may become much smaller, within the next 10 to 20 years, with increasing volumes of payments and exchange taking place on a peer to peer basis.

We will begin with a study of the nature of money and legacy payment and banking systems. We will then study the emergence of stateless, cloud-based digital currency systems since 2009. Further lectures will explore threats that blockchain technology poses to incumbent firms and their resulting attempts to co-opt the technology into existing business models, and the rapid growth of digital finance firms such as Coinbase, Binance, and numerous others. We survey related topics including ransomware, “smart contracts,” initial coin offerings, forks, governance, decentralized finance (De-Fi), stablecoins, central bank digital currencies, and emerging regulation.

Readings

The course readings, to be posted on Google drive, are indicated with each lecture topic.

For optional additional reading, the textbook for the Princeton University COURSERA course on cryptocurrency is a more advanced technical resource: Narayanan et al., *Bitcoin and Cryptocurrency Technologies*. While this textbook is available for purchase online, a draft version of the 2015 first edition can be downloaded for free.

Students are encouraged to stay current on the topic by following recent developments. For daily breaking FinTech news, the authoritative source is the website www.coindesk.com

A concise, non-technical and highly readable introduction to the field is Malekan, *The Story of the Blockchain* (2018).

Another succinct book, written at the intermediate-level book and more focused on Ethereum and decentralized finance is Harvey, Ramachandran and Santoro, *DeFi and the Future of Finance* (2021).

Evaluation

Evaluation will be based 50% on a “proof of work” exercise that will be distributed at the end of the first week (Friday, 15 July), and 50% on an essay assignment that will be distributed at the end of the second week (Friday, 22 July), with everything to be submitted by Wednesday, 27 July (18:00, Basel time).

Lecture topics

An approximate list of the course’s lecture topics appears below. We may deviate from this schedule based upon factors including the pace of individual lectures and current developments in the FinTech marketplace.

13 Course introduction

- July
- *The Economist*, 2015, “The Great Chain of Being Sure About Things”
 - *The Economist*, 2021, special report on The Future of Banking.

Emergence of blockchains and digital currencies

- Haber and Stornetta, 1991, “How to Time-Stamp a Digital Document”
- Segal, 2014, “Eagle Scout. Idealist. Drug Trafficker?”
- Nakamoto, 2008, “Bitcoin: A Peer-to-Peer Electronic Cash System”
- *Optional*: For a possible narrative of the mysterious circumstances surrounding the creation of Bitcoin, visit <http://vu.hn/bitcoin%20origins.html> and see the discussion at <https://blocksplain.com/2018/02/15/satoshi-nakamoto-scronty/>

14 Bitcoin’s public blockchain and how it works

- July
- Böhme, Christin, Edelman, and Moore, 2015, “Bitcoin: Economics, Technology, and Governance”

15 Forks, governance, and dispute resolution

July

Digital currency as a form of money

- Yermack, 2015, “Is Bitcoin a Real Currency? An Economic Appraisal”

18 Digital currencies as investments

July

- Choi, Lehar, and Stauffer, 2019, “Bitcoin Microstructure and the Kimchi Premium”
- Li, Shin, and Wang, 2021, “Cryptocurrency Pump-and-Dump Schemes”
- Ciralsky, 2021, “The Rise and Fall of Bitcoin Billionaire Arthur Hayes”

- 19 Smart contracts and decentralized finance
 July
- Szabo, “Formalizing and Securing Relationships on Public Networks”
 - Chamber of Digital Commerce, 2016, “Smart Contracts – 12 Use Cases for Business”
 - Leisig, 2017, “The Ether Thief”
 - Schär, 2021, “Decentralized finance: On blockchain- and smart contract-based financial markets,” Federal Reserve Bank of St. Louis Review, second quarter, 153-174.
- 20 Altcoins, initial coin offerings (ICOs), and non-fungible tokens (NFTs)
 July
- Howell, Niessner and Yermack, 2020, “Initial Coin Offerings”
 - Chow, 2021, “NFTs are shaking up the art world—but they could change so much more,” March 22.
 - Upson, 2021, “The 10,000 Faces That Launched an NFT Revolution”
- 21 Stablecoins and central bank digital currency (CBDC)
 July
- Dyson and Hodgson, 2016, “Digital Cash: Why Central Banks Should Start Issuing Electronic Money”
 - Brunnermeier, James, and Landau, 2019, “The Digitalization of Money”
- 22 Blockchain applications in the capital markets
 July
- Yermack. 2017, “Corporate Governance and Blockchains,” *Review of Finance*
 - Lantmäteriet, 2017, “The land registry in the blockchain”
 - JPMorgan, 2018, “Blockchain and the Decentralization Revolution”
- Blockchains for supply chain, identity, financial inclusion, healthcare, and other applications
- Yermack, 2018, “FinTech in Sub-Saharan Africa: What Has Worked Well, and What Hasn’t”