

Digital Currency, Blockchains, and the Future of the Financial Services Industry

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Tisch Hall, Room 2-60, 40 West 4th Street
Mondays & Wednesdays, 10:30 – 11:50
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Course overview

Bloomberg summarized a 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, cryptographic tokens, 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. New financing channels such as initial coin offerings have the potential to upend segments of entrepreneurial finance, and have already disrupted legacy venture fundraising.

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, decentralized, cloud-based digital currency systems since 2009, and follow-on investment products, derivatives, and innovations such as initial coin offerings and the extension of cryptocurrency-based technology into securities issuance and trading. Many lectures will explore threats that blockchain technology poses to incumbent firms and even to central banks, and their resulting attempts to co-opt the technology into existing business models. We survey related issues including hacking, “smart contracts,” governance, investment risk and return, and emerging regulatory approaches to these assets.

Learning outcomes

The goal of this course is to equip the students to understand the law and business of blockchain technology, both in its initial application in the digital currency Bitcoin, as well as in the applications currently being explored in the financial services industry and beyond. The course is also intended to create a bridge between law students and business students that will enhance the quality of their communications after they enter into their careers.

Course organization

The course meets twice a week for lectures, Mondays and Wednesdays from 10:30– 11:50. The course will feature guest speakers from industry, academia, and government.

We will follow the academic calendar of the Stern School, with the first class meeting September 5 and the final class on December 12. We will *not* hold class on September 10, September 19, or November 21.

Office Hours:

Professor Yermack will conduct office hours from 9:30 - 10:30 and 3:00 - 4:00 Monday through Thursday most weeks, although there will be exceptions. He is also available by appointment and students are welcome to drop in to his Stern School office, 9-70.

Professor Hinkes will conduct office hours from 9:00 - 10:00 in room 313 at Vanderbilt Hall on those dates when he is scheduled to lecture.

Readings

Many readings for the course will be posted in .pdf or .ppt format on NYU Classes, or will be available through Internet links included in the syllabus below. The syllabus may be updated several times during the semester to reflect the availability of new readings or guest speakers.

We will also use two textbooks:

- Burniske and Tatar, 2018, *Cryptoassets: The Innovative Investor's Guide to Bitcoin and Beyond*. This book is available for purchase at the NYU campus bookstore and from other retail sources.
- Narayanan et al., 2016, *Bitcoin and Cryptocurrency Technologies*. This book, a companion to Princeton University's Coursera open on-line course in digital currency, is available for purchase, but a full pre-publication draft [can be downloaded at no cost](#).

Note that due to the fast-changing nature of the subject matter, material in both books may already appear to be out of date.

Students are encouraged to stay current on the topic by following recent developments. For daily breaking FinTech news, the authoritative source is the website [Coindesk](#).

Evaluation

Evaluation will be based on a short in-class midterm exam and student papers or projects that will be due during the December exam period. Details of the midterm and requirements for the final assignment will be discussed in class early in the semester.

Lecture topics

An approximate list of the course's lecture topics appears below. We may deviate from this schedule based upon the pace of individual lectures, the availability of guest speakers, and developing issues in the FinTech ecosystem.

Sept 5 Course introduction –Yermack & Hinkes

- *The Economist*, 2015, "[The Great Chain of Being Sure About Things.](#)"
- "[The Law of the Horse: What Cyberlaw might teach,](#)" Lessig, Lawrence,

Sept 10 *No Class*

Sept 12 Crypto Building Blocks – Hinkes

This lecture will introduce concepts such as Internet Networking, TCP/IP, databases, cryptography, hashing algorithms, and Merkle trees, which may be unfamiliar to many students in the course.

Sept 17 History of payment systems and the road to Bitcoin – Hinkes

- Narayanan et al, Preface, pp 3-22.
- Burniske & Tatar, Ch. 1-3.

Sept 19 *No Class*

Sept 24 Emergence of blockchains and distributed ledgers – Yermack

Guest speaker: W. Scott Stornetta, pioneer of the distributed ledger
<https://www.edmodo.com/profile/4795235>
<http://nakamotoinstitute.org/authors/w-scott-stornetta/>

- Haber and Stornetta, 1991, “[How to Time-Stamp a Digital Document.](#)”
- Nakamoto, 2008, “[Bitcoin: A Peer-to-Peer Electronic Cash System.](#)”

Sept. 26 How do public blockchains work? (I) – Yermack

- Narayanan, et al. Ch. 1.
- Burniske & Tatar, Ch. 13.

Oct 1 Blockchain applications: voting, lotteries, certificate issuance, and security auditing – Yermack

Guest speaker: Prof. Joseph Bonneau, NYU Courant Institute
<http://jbonneau.com/>
<https://twitter.com/josephbonneau>

Oct 3 How do public blockchains work? (II) – Yermack

- Narayanan, et al. Ch. 5.
- Burniske & Tatar, Ch. 14.

Oct 8 Cryptoassets as financial instruments – Hinkes

Oct 10 Cryptocurrency governance and dispute resolution, and an overview of significant “altcoins” – Yermack

- Narayanan et al, Ch. 4.

Oct 15 AML/KYC, blockchain tracing, and suspicious activities – Hinkes

Guest speaker: Jonathan Levin, co-founder of Chainalysis
https://twitter.com/jony_levin

Oct 17 Digital currency, central banking, and macroeconomics – Yermack

- Dyson and Hodgson, 2016, “[Digital Cash: Why Central Banks Should Start Issuing Electronic Money,](#)” *Positive Money*.

- Raskin and Yermack, 2018, “[Digital Currencies, Decentralized Ledgers, and Future of Central Banking](#),” in *Research Handbook of Central Banking*.

Oct 22 Blockchains in the capital markets – Yermack

Guest speaker: Andrea Tinianow, CIO for Global Kompass Strategies and leader of the Delaware Blockchain Initiative
<https://andreatinianow.com/>
<https://twitter.com/AndreaTinianow>

- Yermack, 2017, “[Corporate Governance and Blockchains](#),” *Review of Finance*.

Oct 24 Blockchains as open source projects – Hinkes

Impact of governance on public chain management, security, updating, and participant voting

- Narayanan et al., Ch. 5.
- Burniske & Tatar, Ch. 14.
- Walch, 2016, “[Call Blockchain Developers What They Are: Fiduciaries](#),” *American Banker*.
- Walch, 2017, “[Open-Source Operational Risk: Should Public Blockchains Serve as Financial Market Infrastructures?](#)” in *Handbook of Blockchain, Digital Finance, and Inclusion*, vol. 2.

Oct 29 **In-class midterm exam**

Oct 31 Introduction to smart contracts and ICOs – Yermack

- Burniske & Tatar, Ch. 4 & 16
- Narayanan et al., Ch. 9.
- Szabo, 1996, “[Formalizing and Securing Relationships on Public Networks](#).”
- Chamber of Digital Commerce, 2016, “[Smart Contracts – 12 Use Cases for Business & Beyond](#).”

Nov 5 Ethereum and TheDAO – Hinkes

- Hinkes, TheDAO (unpublished)
- Hinkes, 2016, “[A Legal Analysis of the DAO Exploit and Possible Investor Rights.](#)” *Bitcoin Magazine*.
- U.S. Securities and Exchange Commission, Report of Investigation: [The DAO](#).
- www.ethereum.org
- [“Definition of a Security”](#)

Nov 7 Digital currencies as investments – Yermack

Guest speaker: Barry Silbert, Founder, Digital Currency Group
<http://dcg.co/who-we-are/>
<https://twitter.com/barrysilbert>

- Burniske & Tatar, Ch. 14-15.

Nov 12 Token sales/ICOs: Regulation – Hinkes

- What Constitutes a Security and Requirements Relating to the Offer and Sales of Securities and Exemptions From Registration Associated Therewith,
https://www.americanbar.org/publications/blt/2017/04/06_loev.html
- U.S. Securities and Exchange Commission, Report of Investigation: [TheDAO](#).
- U.S. Securities and Exchange Commission, *In re: Munchee*,
- William Hinman, 2018, “[Digital Asset Transactions: When Howey Met Gary \(Plastic\)](#),” remarks at the Yahoo Finance All Markets Summit: Crypto.
- [A Historical Introduction to the Securities Act of 1933 and the Securities Exchange Act of 1934](#)
- Investor Bulletin: [An Introduction To The U.S. Securities And Exchange Commission – Rulemaking And Laws](#)
- [Private Placements 506\(b\)](#)
- [Private Placements 506\(c\)](#)
- [Private Placements 504](#)
- [Private Placements: Reg A](#)
- [Private Placements: Regulation Crowdfunding](#)

Nov 14 Regulation and function of Crypto Investment Markets – Hinkes

- Burniske & Tatar, Ch. 7-13 (suggested)
- [A CFTC Primer on Virtual Currencies](#)
- [CFTC v. McDonnell](#), 18-CV-361 (S.D.N.Y., 2018)
- [17 CFR 242.301](#), “Requirements of an Alternative Trading System”
- Mahoney & Rautenberg, [The Regulation of Trading Markets: a Survey and Evaluation](#)
- [U.S. Launches Criminal Probe into Bitcoin Price Manipulation](#)

Nov 19 Cryptoassets and litigation – Hinkes

Nov 21 *No class*

Nov 26 Blockchains and provenance in the art world – Yermack

Guest speaker: Prof. Amy Whitaker, NYU Steinhardt School
https://steinhardt.nyu.edu/faculty/Amy_Whitaker
<https://twitter.com/theamywhit>

- Bailey, 2017, "[The Blockchain Art Market Is Here](#)," *Artnome*.
- Reyburn, 2018, "[Will Cryptocurrencies be the Art Market's Next Big Thing?](#)" *The New York Times*, January 13.
- Additional optional reading posted on NYU Classes

Nov 28 Taxation of digital assets – Hinkes

- Burniske & Tatar, Ch. 17, pp 274-277.
- U.S. Internal Revenue Service, [Notice 2014-21](#)
- [Letter to IRS](#) from Sen. Hatch, Congressman Brady, Congressman Buchanan, May 17, 2017
- TREASURY INSPECTOR GENERAL FOR TAX ADMINISTRATION Report, "[As the Use of Virtual Currencies in Taxable Transactions Becomes More Common, Additional Actions Are Needed to Ensure Taxpayer Compliance.](#)" September 21, 2016
- US v. Coinbase, Case No. 3:17-cv-01431-JSC, DE #78, (N.D. Ca. Nov. 27, 2017) [Order re: Petition to Enforce IRS Summons](#),

Dec 3 Cryptocurrency arbitrage and hedging – Yermack

Guest speaker: Tim McCourt, Managing Director, CME Group

<https://twitter.com/timmccourtme>

Dec 5 Altcoins and consensus mechanisms beyond proof of work – Yermack

- Burniske & Tatar, Ch. 4.
- Narayanan et al, Ch. 10.

Dec 10 Enterprise blockchains – Hinkes

Guest speaker: TBA

Dec 12 Second layer protocols – Hinkes

Guest speaker: TBA