

# **FinTech: Shaping the Financial World**

**May 11, 2020**

# Class 12: Overview

- Finance Technology Stack
- FinTech – The Actors
- AI, Machine Learning & Natural Language Processing – Finance
- Open API, Open Banking & Robotic Process Automation
- Credit Scoring & Alternative Data
- Blockchain Technology & Cryptocurrencies
- Sector Review, Competitive Landscape & Coronavirus Crisis
- Conclusions

# Class 12: Study Questions

- What is FinTech & how might it shape the future of money and finance?
- How can one best assess the viability of FinTech project?
- Has this class met your goals? Has it made you more bullish or more bearish on fintech?

# Finance Technology Stack

? Blockchain Tech, etc. ? >

Sensors & Telematics >

Open API >

AI, ML & NLP >

Cloud >

Mobile >

Internet >

Money, Accounting, Ledgers, Joint Stock Companies, Markets, Derivatives,  
Electronic Messaging, Credit Cards, Securitizations, etc. >

# Customer Interface

Chatbots, CI & Voice Assistants (2010s)

Open APIs (2000s) & Open Banking (2015)

Contactless & Cardless Systems (2000s) >

Mobile Payments (2000s) & Wallets (2008) >

Internet (1990s) & On-line Banking (1990s - 2000s) >

Automatic Teller Machines (1970s) >

Credit Cards (1940 – 50s) & Point of Sale Systems (1980s) >

Mortgage Brokerage (1890s) & Automobile Indirect Lenders (1910s) >

Electronic Payments (1870s), Wires (1910s), ACH (1970s) & Direct Deposits (1970s) >

Checks (800s), Negotiable Checks (1500s), & Preprinted Checks (1760s) >

Banking - Tents, Temples, Bricks & Mortar (4<sup>th</sup> – 1<sup>st</sup> millennium BCE) >

# Funding & Risk Management

Sensors & Telematics (2010s) >

ML Based Underwriting (2010s) >

Peer to Peer Lending (2005) >

Credit Default Swaps (1990s) >

Asset Backed Securitizations (1970s – 90s) >

Interest Rate Futures (1970s) & Interest Rate Swaps (1980s) >

Consumer Credit Scoring (1960s) & FICO Scores (1990s) >

Consumer Finance Companies & Warehouse Lines of Credit (1920s) >

Private (1880s, 1950s), Government (1930s) & GSEs (1930s) Mortgage Insurance >

Bankruptcy & Secured Lending Laws, Loan Servicing & Collection Agents (Days of old) >

Bank Deposits - (Antiquity) >

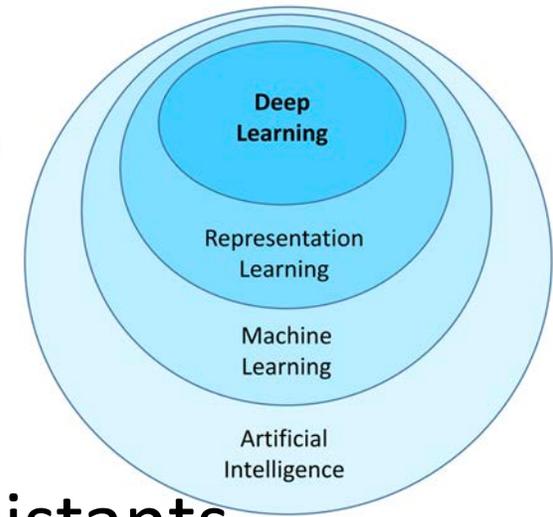
# FinTech - Finance's Fertile Ground

- Digitalization of Money, Securities and Credit
- Wide Public Acceptance of New Tech
- Legacy Customer Interface and Processing Systems
- Vast and Expanding Amounts of Customer Data
- Rapid Expansion of Computational & Analytical Power
- Reliance on Multiple Systems of Ledgers
- Infrastructure Systems' Costs and Counterparty Risks
- Economic Rents and Centralized Concentrated Risks

# FinTech – The Actors

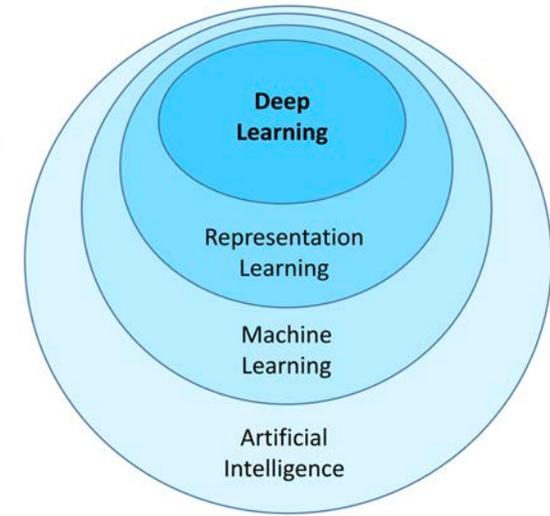
- **Big Finance:** Like ‘Fortresses’ w/ Moats, Towers & Sovereign Affiliations
  - ‘Towers’: 1) Payments, 2) Balance Sheets, 3) Data, 4) Corporate Structure
- **Big Tech DNA Loop (BIS):** 1) Data, 2) Networks, 3) Activities
- **Start-ups:** 1) Disruptive Innovators, 2) Flexibility, 3) Asymmetric Risk Takers
- **Official Sector:** Goals: 1) Economic Growth, 2) Financial Stability, 3) Guarding against Illicit Activities, 4) Inclusion, 5) Investor & Consumer Protection

# AI and Machine Learning - Finance



- Asset Management
- Call Centers, Chatbots, Robo-Advising & Virtual Assistants
- Credit & Insurance - Allocation, Extension, Pricing & Scoring
- Fraud Detection & Prevention
- Regulatory – Anti Money Laundering, Anti Manipulation
- Risk Management & Underwriting
- Robotic Process Automation
- Trading

# AI and Machine Learning - Finance



- **AI as a Tool**

- Big Finance, Big Tech, & FinTech Disrupters

- **AI as a Service**

- AlphaSense (2011) – Search Engine
- Cape Analytics (2014) – Insurance Property Risk Analytics
- ComplyAdvantage (2014) – Anti-Money laundering & KYC Software
- Dataminr (2009) - Market Sentiment Analysis
- Featurespace (2008) – Anti-fraud Software
- HyperScience (2014) – Document Processing
- Tractable (2014) – Insurance Claims Processing
- Zest AI (2009) – Credit Underwriting Software
- Zesty.ai (2015) – P & C Insurance Risk Analytics

# Natural Language Processing - Finance

- Content Generation, Content Summarization, Information Retrieval, Intent Parsing, Sentiment Analysis, Speech Generation, Speech Recognition and Translation
- Customer Services
  - Chatbots, Conversational Interfaces and Voice Assistants
- Process Automation
- Sentiment Analysis

# Open API & Open Banking

- Open Application Program Interfaces (Open API) allow outside Developers access to and an ability to Integrate Permissioned Customer Data into Third Party Applications
- Open Banking initiatives facilitates or mandates Open API for Non-banks to Share Permissioned Bank Customer Data

# Open API & Open Banking

- Policy Trade-offs of Promoting Competition & Innovation, Limiting Cybersecurity Risks, and Maintaining Privacy & Consumer Protections
- EU Payment System Directive (PSD2), UK Open Banking Initiative, etc.
- Alternatives: Screen Scraping, Reverse Engineering & Robotic Process Automation

# Robotic Process Automation

- Account Opening & Onboarding
- Loan Processing
- Report Generation
- Screen Scraping

# FICO Scores



# Alternative Data

- Bank, Checking, Employment, Income, Insurance, Tenant, Utilities
- Cash Flow Underwriting
  
- Consumption and Purchase Transactional Data
- Educational Background, Employer, Occupation, Work History
- App Usage, Browsing History, Email Receipt, Geolocation, Social Media Data
  
- Sensor Data - Drones, IoTs, Smartphones, Telematics, & Wearables
- Genetic Testing

# Blockchain Technology & Cryptocurrencies

- Nakamoto solved the payments riddle - avoiding double spending
- Money is but a social & economic construct
- Append-only logs & multiparty consensus provides a peer-2-peer alternative
- Can address verification and networking costs
- Crypto markets are rife with scams, fraud, hacks & manipulation
- Cryptocurrencies have evolved into a speculative asset class
- Adoption rests on addressing comparative viability & value proposition
- The potential, though, to be a catalyst for change is real

# Payment System 'Pain Points'

- Chargebacks
- Complexity
- Costs
- Cross Border Payments
- Data Privacy
- Delayed Settlement
- Financial Inclusion
- Fraud
- Public Policy Compliance

# Big Finance



China Construction Bank



# FinTech – Payments

## Big Tech



2003



2007



2007



2011



2013



2014



2014

## Startup Unicorns



# Credit & Lending: Market Design

## Data

- Alternative Data, Credit Scoring, Cross Selling, Marketing & Underwriting

## Funding

- Balance Sheet, Securitization, or Issuer Bank Partner

## Marketing Channels

- User Experience & User Interface

## Risks

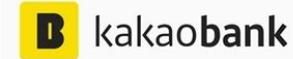
- Credit / Default, Market (Basis, Rate, Spread, Volatility), & Prepayment
- Funding, Liquidity, Model, Operational, & Reputational / Compliance

## Roles

- Brokerage / Origination, Underwriting, Credit Enhancing, Securitizing, Credit Rating, Appraising, Servicing, Collecting / Foreclosing, & Funding

# FinTech – Credit

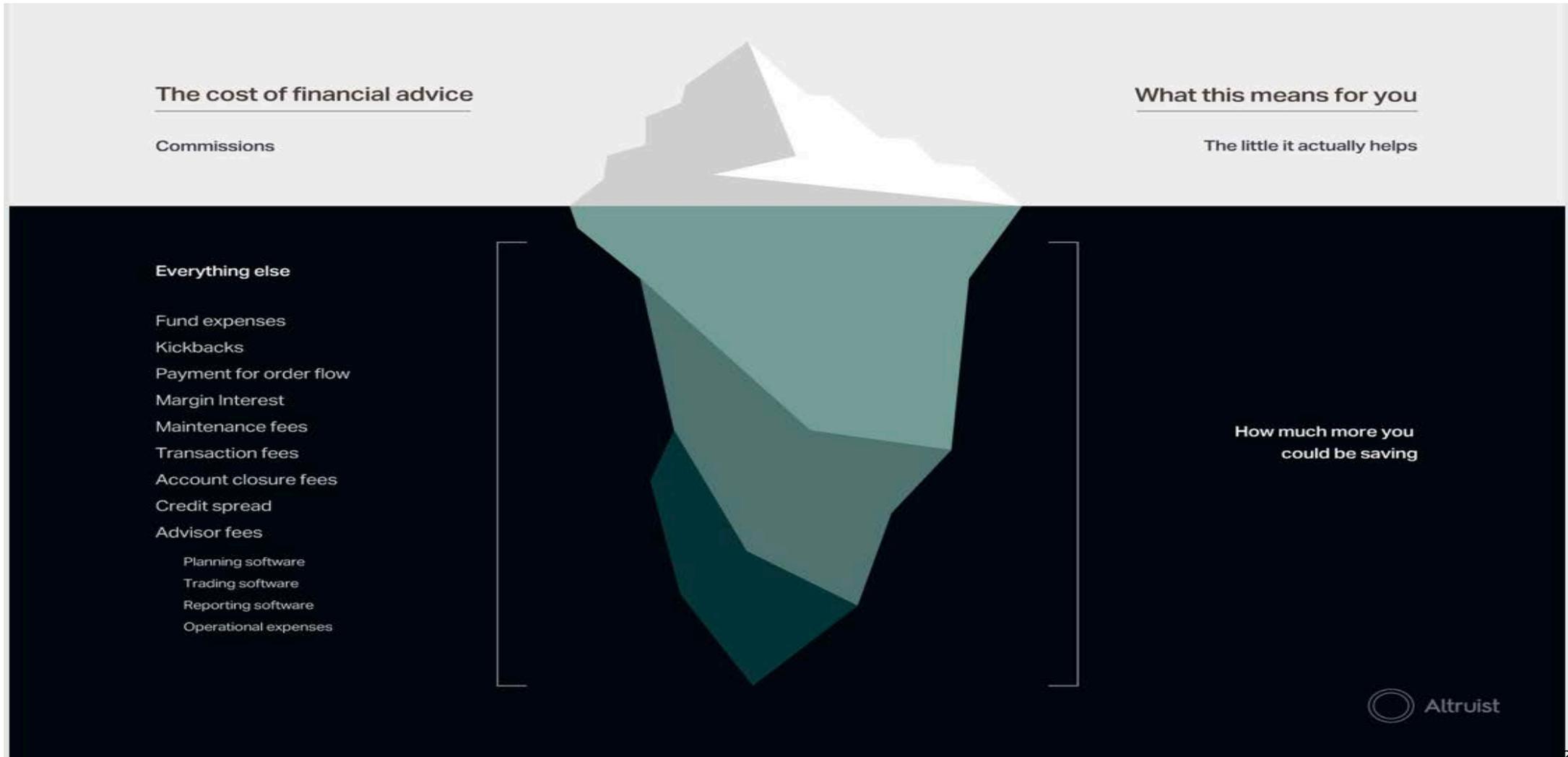
## Big Tech



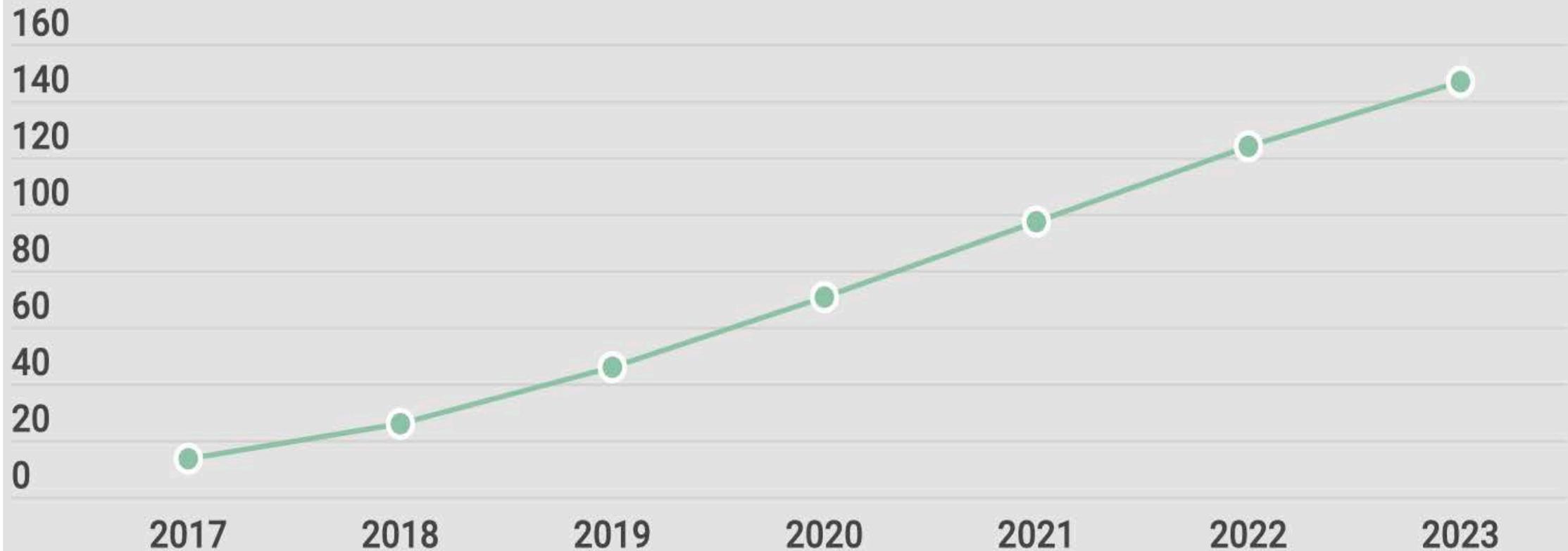
## Credit Unicorns



# Zero Commission Revenue Models



# Number of users in the robo-advisors segment, in millions



# FinTech – Capital Markets

- Online Brokerage



- Asset Management and Advisory



- Trading and Capital Markets



# InsurTech Opportunities

- Sales, Account Management & Claims UI & UX:
  - Digital, Mobile & Conversational Interface
- Underwriting Availability, Pricing & Targeted Products:
  - Machine Learning & Alternative Data
- Claims Processing & Underwriting Data Capture:
  - Drones, Internet of Thing Sensors, Smartphones Telematics, & Wearables
  - Genetic Testing – Life, Disability & Long-term Care

# Insurance Sector Challenges

- Agent & Broker Fees
- Claims Administration
- Distribution Channels
- Legacy Tech
- Operating Costs & Expense Ratios
- Product Development & Speed to Market
- Regulatory Landscape
- Trust
- User Interface and User Experience

# FinTech – InsurTech Startups

- Property & Casualty



- Health



- Benefits Administration



# Coronavirus Crisis & FinTech Startups

- Focus on 'Runway': Burn Rates, Cash, Revenue & Adoption Rates
- IPOs on Hold
- VC Investment will Slow
- Valuations Decline
  
- Consolidation likely to Increase
- There will be Winners & Losers w/ Sector Mattering
- Opportunities arise to Serve Fiscal Stimulus & Loan Programs
- Challenges of Delinquencies & Defaults on Horizon

# Courses - Fall 2020

- Blockchain & Money (15.235)
  - Tentatively: Tues/Thurs 2:30 – 4 pm
- Collaborative Intelligence Ventures (15.S57/ 6.S077/6.S977)
  - Prep for MIT's spring Collaborative Intelligence Ventures Competition
  - Project focus on humans and machines working together collaboratively
  - H2 – Tentatively: Wed 3 – 5 pm
  - Taught w/ Jonathan Ruane & Julie Shah

# Courses - Fall 2020

- Coronavirus Lecture & Lab Course (TBD)
  - Focusing on Coronavirus Crisis
  - To include both Lecture and Project Components
  - Led by Simon Johnson, Asu Ozdaglar along w/ other MIT faculty
  - Tentatively: Tues / Thurs
  - Multiple Action Learning Streams tentatively to include:
    - FinTech & Coronavirus
    - Public Policy & Coronavirus
    - Other Project Work Streams

# Pay it Forward

**Benjamin Franklin, 1784**

I do not pretend to give such a deed; I only lend it to you.

When you [...] meet with another honest Man in similar Distress, you must pay me by lending this Sum to him; enjoining him to discharge the Debt by a like operation, when he shall be able, and shall meet with another opportunity.

I hope it may thus go thro' many hands, before it meets with a Knave that will stop its Progress.

This is a trick of mine for doing a deal of good with a little money.

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15.S08 FinTech: Shaping the Financial World  
Spring 2020

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