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

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 (4th – 1st millennium BCE)
Funding & Risk Management

- Bank Deposits - (Antiquity)
- Consumer Finance Companies & Warehouse Lines of Credit (1920s)
- Consumer Credit Scoring (1960s) & FICO Scores (1990s)
- Asset Backed Securitizations (1970s – 90s)
- Interest Rate Futures (1970s) & Interest Rate Swaps (1980s)
- Credit Default Swaps (1990s)
- Peer to Peer Lending (2005)
- ML Based Underwriting (2010s)
- Sensors & Telematics (2010s)
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

Image by Lex Fridman. Used with permission.
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
  - Tractable (2014) – Insurance Claims Processing
  - Zest AI (2009) – Credit Underwriting Software

Image by Lex Fridman. Used with permission.
Natural Language Possessing - 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
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

Bank of America
BlackRock
BNP Paribas
CHASE

China Construction Bank
CIBC
citi
Fidelity

Goldman Sachs
HSBC
ICBC
ICE NYSE

MUFG
Nasdaq
STATE STREET
Vanguard
FinTech – Payments

Big Tech

- 支付宝 Alipay
- M-Pesa Safaricom
- Amazon Pay
- Google Pay
- 微信支付 WeChat Pay
- Apple Pay
- kakaopay

- 2003
- 2007
- 2007
- 2011
- 2013
- 2014
- 2014

Startup Unicorns

- avidxchange
- BREX
- Klarna
- nu bank
- one97
- PagSeguro
- PLAID
- ripple
- Square
- stone
- stripe
- toast
- Toss
- TRADESHIFT
- TransferWise
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

The cost of financial advice

Commissions

Everything else

- Fund expenses
- Kickbacks
- Payment for order flow
- Margin Interest
- Maintenance fees
- Transaction fees
- Account closure fees
- Credit spread
- Advisor fees
  - Planning software
  - Trading software
  - Reporting software
  - Operational expenses

What this means for you

- The little it actually helps
- How much more you could be saving

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

Source: ‘Robo-advisor Industry to hit $1.4tn This Year’ Jastra Ilic, LearnBonds (April 15, 2020)
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
  - ASSURANCE
  - bgl
  - Goji
  - Hippo
  - Lemonade
  - NEXT
  - policybazaar.com
  - Root Insurance Co
  - wefox

• Health
  - bright HEALTH
  - Clover
  - oscar

• Benefits Administration
  - GUSTO
  - HealthEquity
  - ZENEFITS
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
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.