AI Technology, Policy and Society: Priorities, Opportunities and Trade-Offs

AI in Finance – The Opportunities, Policy Considerations and Trade-offs

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Overview

• Financial Sector
• FinTech
• AI and Machine Learning in Finance
• Finance Public Policy Framework
• AI Policy and Finance
• AI, Finance, and Geopolitics
Financial Sector

Moves, Allocates & Prices Money and Risk
Financial Institutions

Intermediaries of Financial Assets and Liabilities

• Functions
  • Investments
  • Credit
  • Risk Transformation
  • Capital Markets & Price Discovery
  • Advice regarding Financial Assets and Liabilities
Financial Institutions

Intermediaries of Financial Assets and Liabilities

• Sectors

  • Commercial Banks & Credit Unions
  • Investment Banks & Brokerage Firms
  • Insurance Companies & Underwriters
  • Investment Vehicles, Mutual Funds, Pension Funds & Annuities
  • Asset Managers & Financial Advisors
  • Exchanges, Clearinghouses & Settlement Organizations
FinTech

• ‘Technology-enabled innovation in financial services associated with new business models, applications, processes or products, all of which have a material effect ...’

Financial Stability Board
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) Innovation, 2) Inclusion, 3) Financial Stability, 4) Investor & Consumer Protection & 5) Guarding against Illicit Activities
FinTech – Technologies of our Times

AI & ML

Blockchain

Natural Language Possessing

Open API

Biometrics

Chatbots

Cloud

Robotic Process Automation
FinTech - Finance’s Fertile Ground

• Dematerialization of Money, Securities and Credit
• Vast and Expanding Amounts of Customer Data
• Rapid Expansion of Computational & Analytical Power
• Reliance on Multiple Systems of Ledgers
• Wide Public Acceptance of New Tech
• Legacy Customer Interface and Processing Systems
• Infrastructure Systems’ Costs and Counterparty Risks
• Economic Rents and Centralized Concentrated Risks
FinTech – Disruptive Potential

• Greater Financial Inclusion & Peer to Peer Services
• AI for Managing Credit, Trading, Insurance & Underwriting Risks
• Significant Change in Payment Services
• Updated Customer User Interface and Robo Advice
• ‘Internet of Value’: Movement of Value & Micro Payments
• Streamlined Accounting, Clearing, Compliance & Processing Systems
• Some Revenue Models shift to Data in exchange for Free Services
• Efficiencies & Tighter Margins in Financial Sector
FinTech – Payments & Credit

**Big Tech**

- Alipay
- M-Pesa
- Safaricom
- Amazon Pay
- Google Wallet
- WeChat Pay
- Apple Pay
- KakaoPay

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

**Payment Unicorns**

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

**Credit Unicorns**

- Affirm
- Atom bank
- AVANT
- chime
- credit karma
- Dave.com
- Kabbage
- monzo
- N26
- OakNorth
- PROSPER
- Revolut
- SoFi

FinTech – Other Startup ‘Unicorns’

• Insurance and Benefits

• Trading and Capital Markets

• Asset Management and Advisory

• Comprehensive
AI and Machine Learning

Deep Learning in One Slide

• What is it:
  Extract useful patterns from data.

• How:
  Neural network + optimization

• How (Practical):
  Python + TensorFlow & friends

• Hard Part:
  Good Questions + Good Data

• Why now:
  Data, hardware, community, tools, investment

• Where do we stand?
  Most big questions of intelligence have not been answered nor properly formulated

Exciting progress:

• Face recognition
• Image classification
• Speech recognition
• Text-to-speech generation
• Handwriting transcription
• Machine translation
• Medical diagnosis
• Cars: drivable area, lane keeping
• Digital assistants
• Ads, search, social recommendations
• Game playing with deep RL

Source: ‘Deep Learning Basics’ Lex Fridman
https://deeplearning.mit.edu
AI, Big Data and Machine Learning
Financial Stability Board

• ‘The application of computational tools to address tasks traditionally requiring human sophistication is broadly termed ‘artificial intelligence’

• ‘Big data’ is a term for which there is no single, consistent definition, but the term is used broadly to describe the storage and analysis of large and/or complicated data sets using a variety of techniques including AI.’

• ‘Machine learning’ may be defined as a method of designing a sequence of actions to solve a problem, known as algorithms, which optimise automatically through experience and with limited or no human intervention.’

Source: ‘Artificial intelligence and machine learning in financial services’ FSB (November 1, 2017)
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
Hi, I am Erica. See what I can do for you.
Finance Public Policy Framework

• Money & Lending

• Financial Stability

• Protecting the Investing Public

• Guarding Against Illicit Activity
FinTech - Policy Alternatives

• Technology Neutrality
• New Activities Come within Existing Frameworks & Laws
• Clarification where Application of Rules are Ambiguous

• Legal and Regulatory Requirements Adjusted:
  • For New Activities ... or Technologies
  • For Existing Activities
• Regulatory Perimeters Moved

• Promote Early Stage Activity ... or Technologies (e.g. Sandboxes)
• Promote via Open Banking & Competition Policy
AI Policy and Finance

• Biases, Fairness, and Inclusion
• Explainability, Transparency, and Auditability
• Privacy and Data Ownership
• Use of Alternative Data
• Algorithmic Correlation or Collusion ?=> Interconnectedness
• Resiliency vs. Fragility
• Risk Management and Oversight
• How AI & ML Fits within Current Regulatory Frameworks
• Principles & Guidelines generally at High level & Non-Binding
Apple Credit Card

DHH
@dhh

She spoke to two Apple reps. Both very nice, courteous people representing an utterly broken and reprehensible system. The first person was like “I don’t know why, but I swear we’re not discriminating, IT’S JUST THE ALGORITHM”. I shit you not. “IT’S JUST THE ALGORITHM!”.
I'm a current Apple employee and founder of the company and the same thing happened to us (10x) despite not having any separate assets or accounts. Some say the blame is on Goldman Sachs but the way Apple is attached, they should share responsibility.
AI & U.S. Consumer Credit Laws

• Equal Credit Opportunity Act (ECOA)
  • Disparate Treatment or Disparate Impact
  • Regulation B on Notices on Actions
• Fair Housing Act
• Fair Credit Reporting Act (FCRA)
  • Consumer Reporting Agencies and Consumer Reports
  • Notice Requirements on Adverse Actions
• Unfair, Deceptive, and Abusive acts and Practices (UDAAPs) - CFPB
• Unfair and Deceptive acts and Practices (UDAP) - FTC & States
AI, Finance, & Geopolitics

- Finance is Interconnected Globally and Regulated Locally
- Countries Vary in Development, Concentration and Public Sector Involvement

- International Organizations (OECD ...) Guidelines generally at High level
- Financial Policy Standard Setters (Basal, FATF, IOSCO ..) are Non-Binding
- No Internationally Enforceable Standards

- Competing models on AI, Finance & Policy trade-offs
Conclusions

• Finance has long had a Symbiotic Relationship with Technology
• We already Live in a Digital Financial Age
• The Pace of Technology Innovation and Adoption has Accelerated

• AI and Machine Learning present both Rewards & Risks
• Startups, Big Finance and Big Tech will all Play a Role
• Development will Swing with much Hype Masquerading as Fact
• Public Confidence is built upon Living within Public Policy Norms

• AI and ML, though, will disrupt current Service, Revenue and Margin Models
• Potential to Lower Costs, Enhance Services & Promote Growth is Real