NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Leir Research Institute's Virtual Conference 2021

Disruptive Technologies, Regulations, Business – Implications in the FinTech Industry

Friday, August 27, 2021
9:00 A.M. - 1:00 P.M.

Presented by:
The Martin Tuchman School of Management

NJIT New Jersey Institute of Technology

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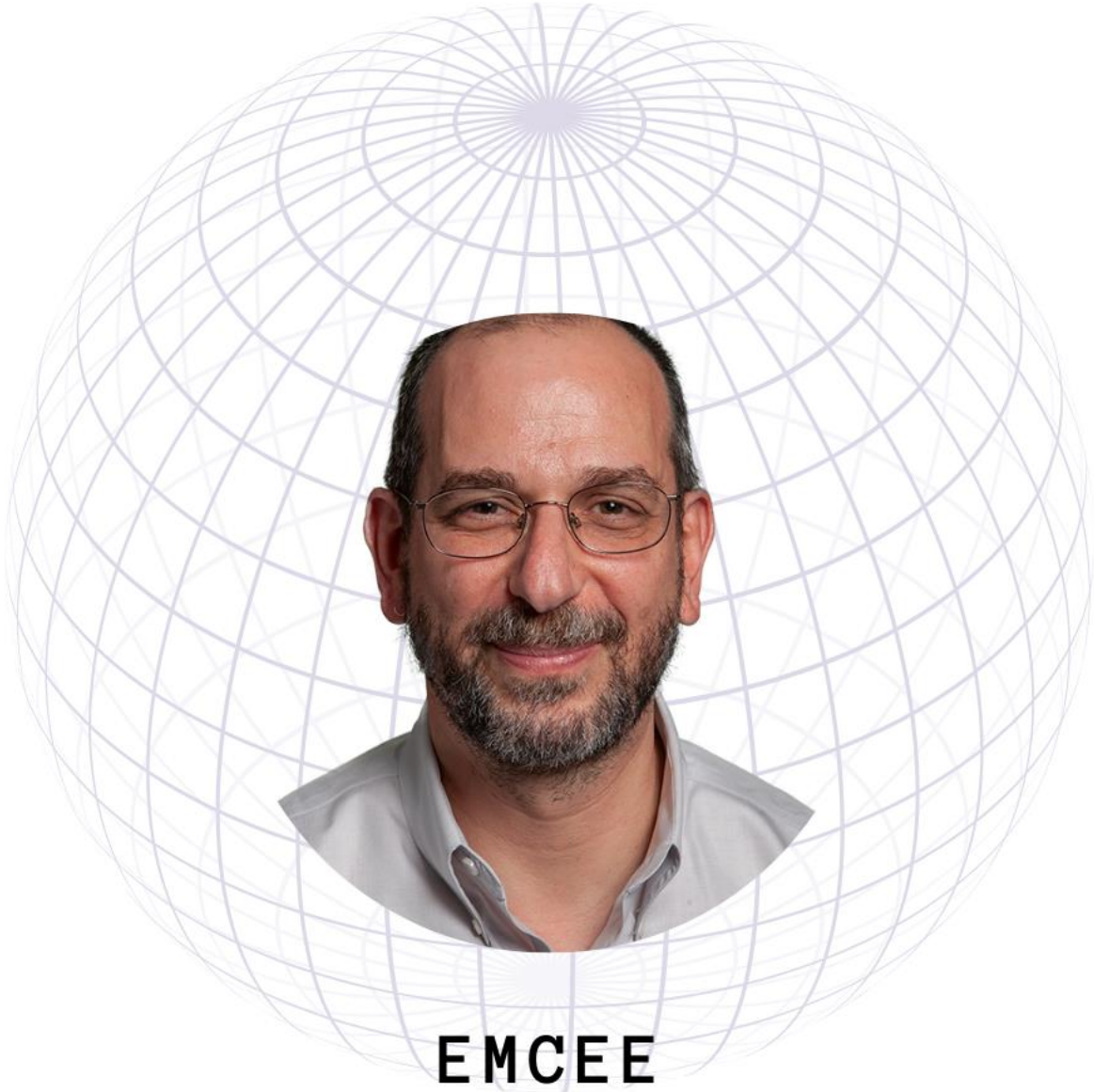
New Jersey Institute of Technology

Martin Tuchman School of Management

Leir Research Institute



EMCEE

MICHAEL EHRLICH, PH.D.

Director, Leir Research Institute
Associate Professor of Finance

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OYA TUKEL, PH.D.

Dean
Martin Tuchman School of Management

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FADI P. DEEK, PH.D.

Provost and Senior Executive Vice President

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ZHIPENG YAN, PH.D.

Associate Dean
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NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Session # 1

Academic Overview of FinTech Research

Presented by:
The Martin Tuchman School of Management

MODERATOR

JIM SHI, PH.D.

Leir Research Institute
Martin Tuchman School of Management

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KEYNOTE SPEAKER

TUCKER BALCH, PH.D.

Managing Director at J.P. Morgan AI Research

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AI Research at J.P. Morgan

NJIT, August 2021

Tucker Balch, PhD

Managing Director, J.P. Morgan AI Research

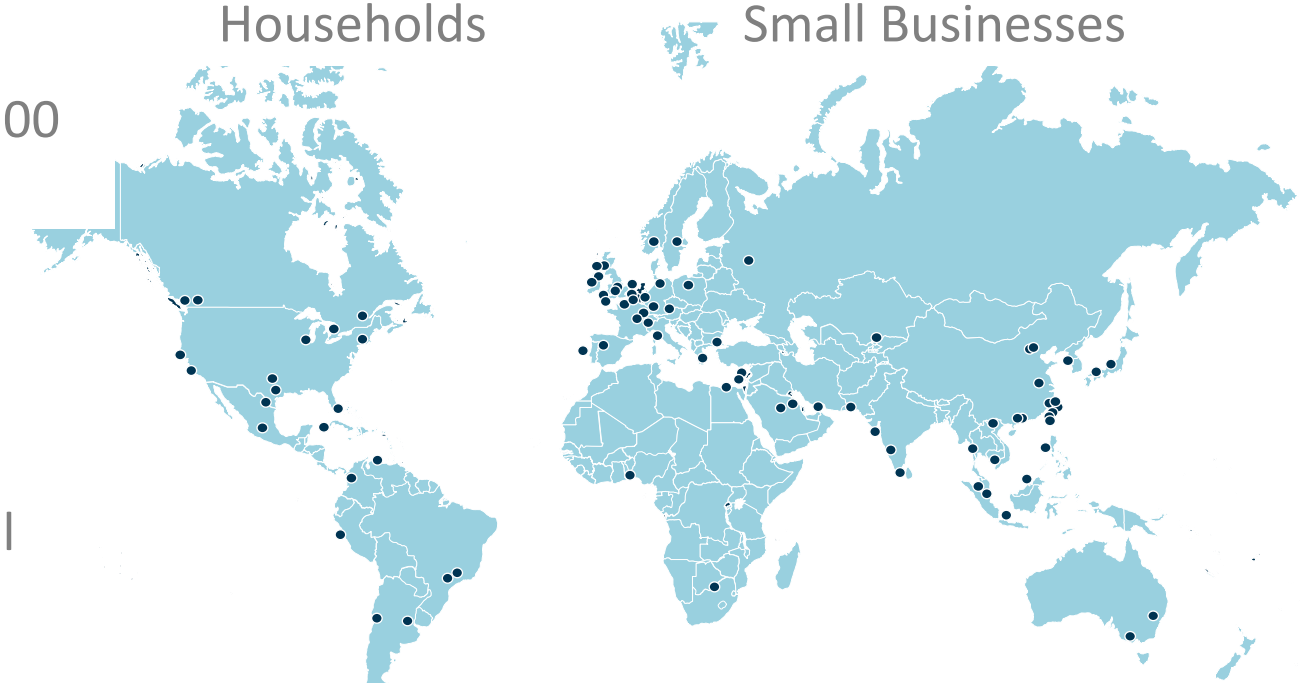
Professor, Georgia Institute of Technology

J.P.Morgan Chase

>80%
of Fortune 500 companies

60M
Households

4M
Small Businesses



>100
Markets

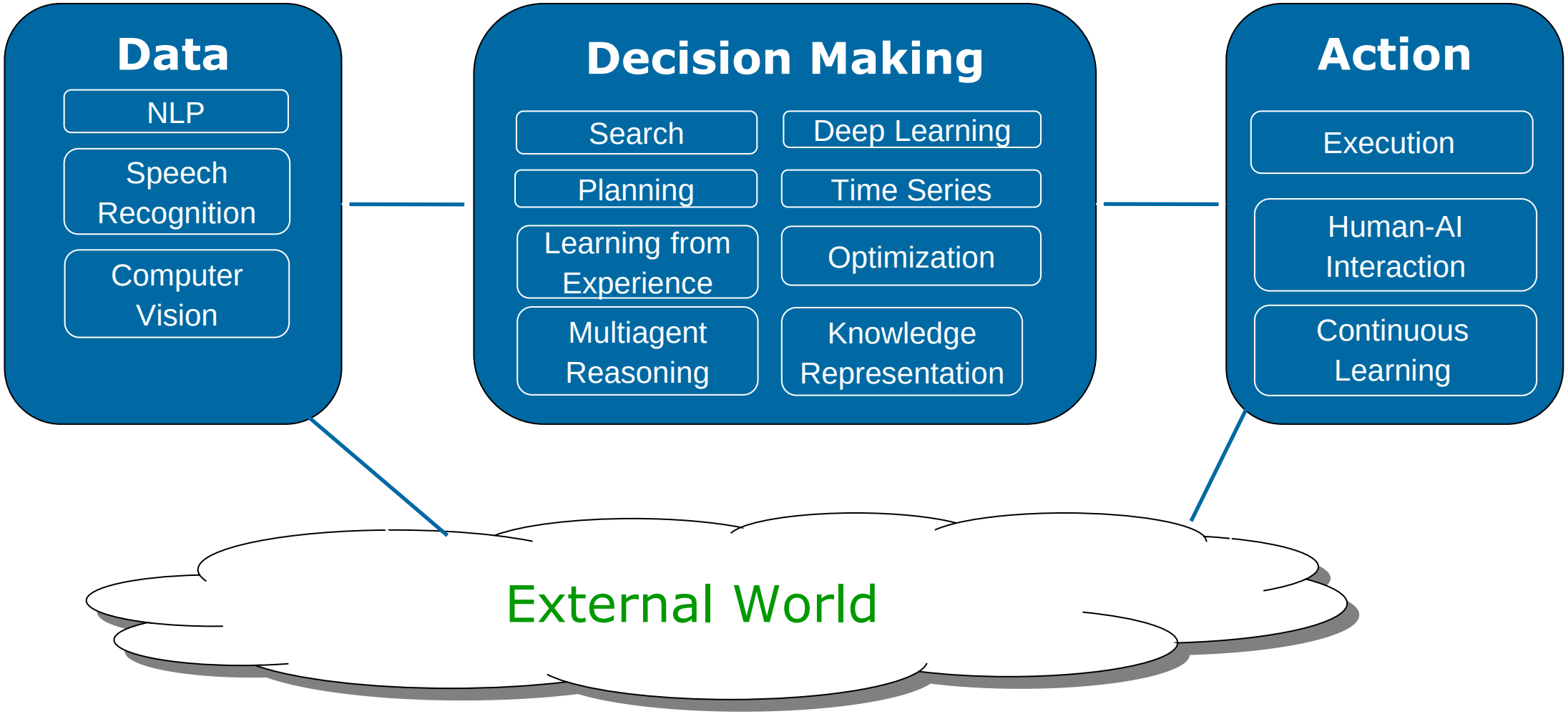
47M
Active digital customers

250k
Employees
60k in APAC
20k EMEA
3k LatAm

5,000
U.S. Branches

50k
Technologists

Artificial Intelligence



AI Research – Aspirational Goals

Domain

- AI *to Predict and Affect*
  Economic Systems
- AI *to Liberate*
  Data Safely
- AI *to Eradicate*
  Financial Crime

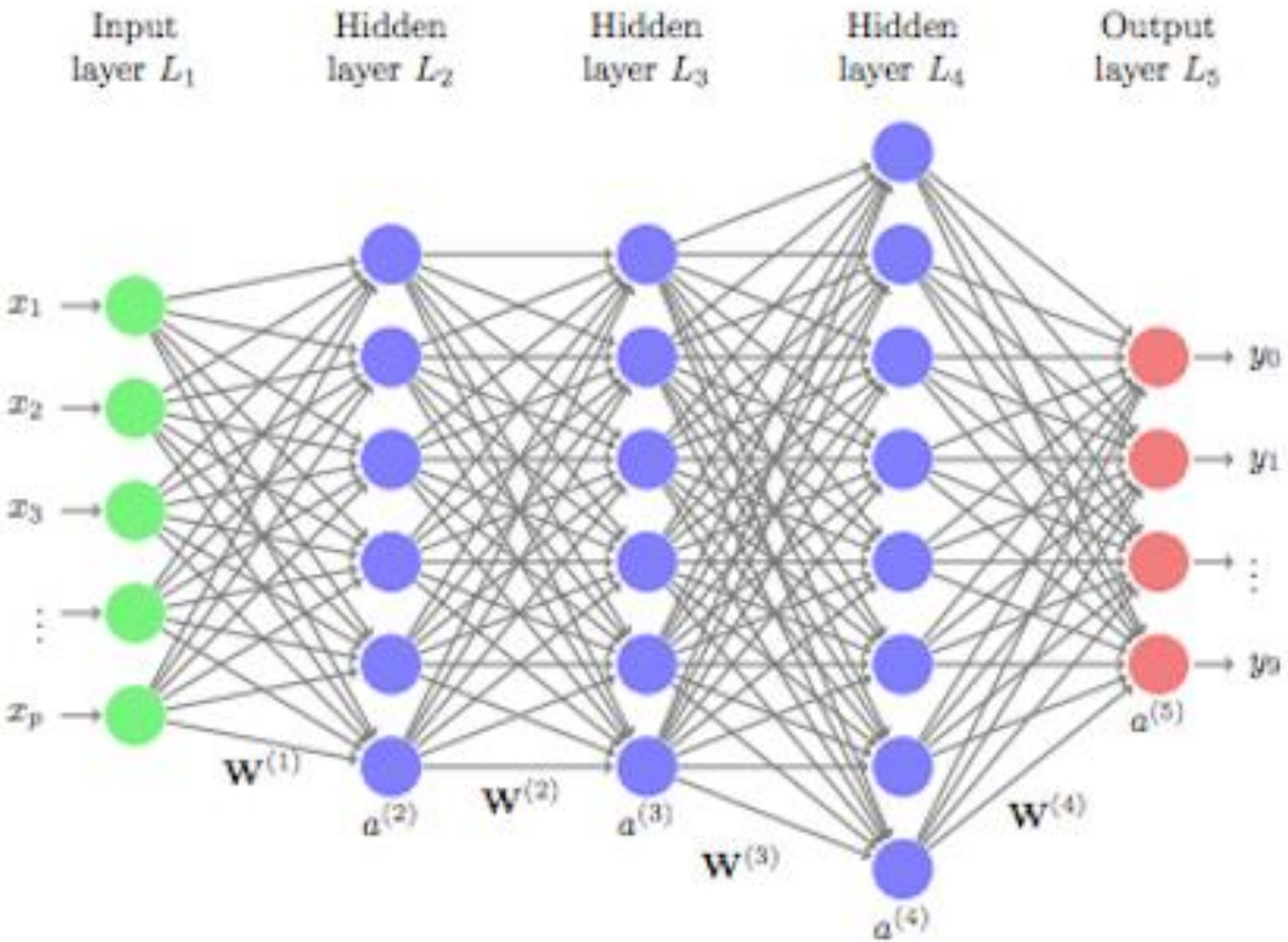
Stake holders

- AI *to Empower*
  Employees
- AI *to Perfect*
  Client Experience
- AI *to Agentize*
  Policy Compliance

Values

- **Establish Ethical and Socially Good AI**

Mondrian: Decisions from observing ***images***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Hidden layer L_2
Hidden layer L_3
Hidden layer L_4
Output layer L_5
x_1
x_2
x_3
x_p
y_0
y_1
y_2
$\mathbf{W}^{(1)}$
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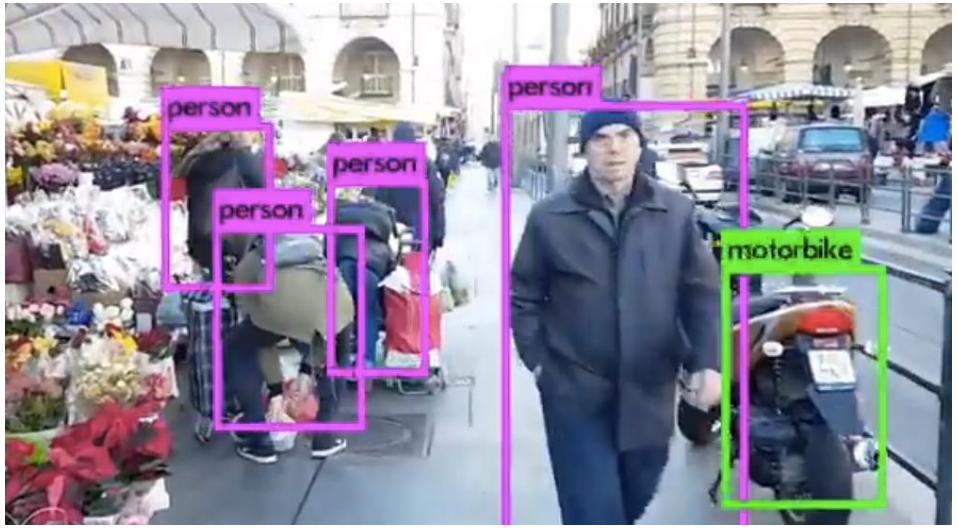
$a^{(3)}$
$a^{(4)}$
$a^{(5)}$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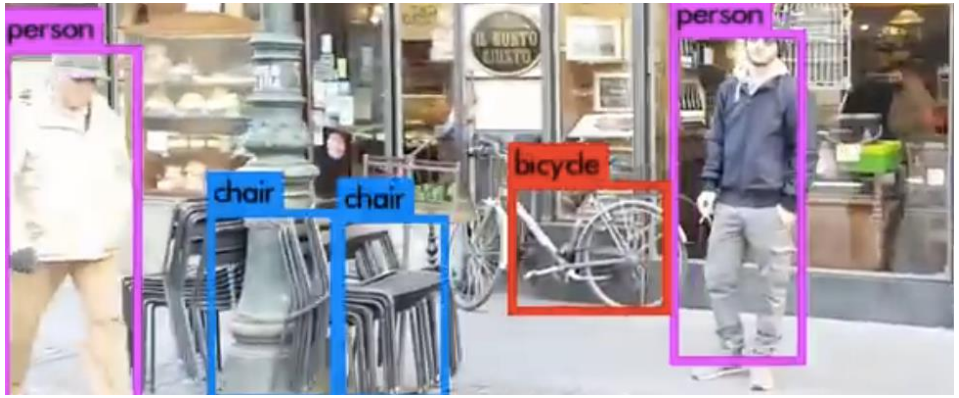
person
person
person
motorbike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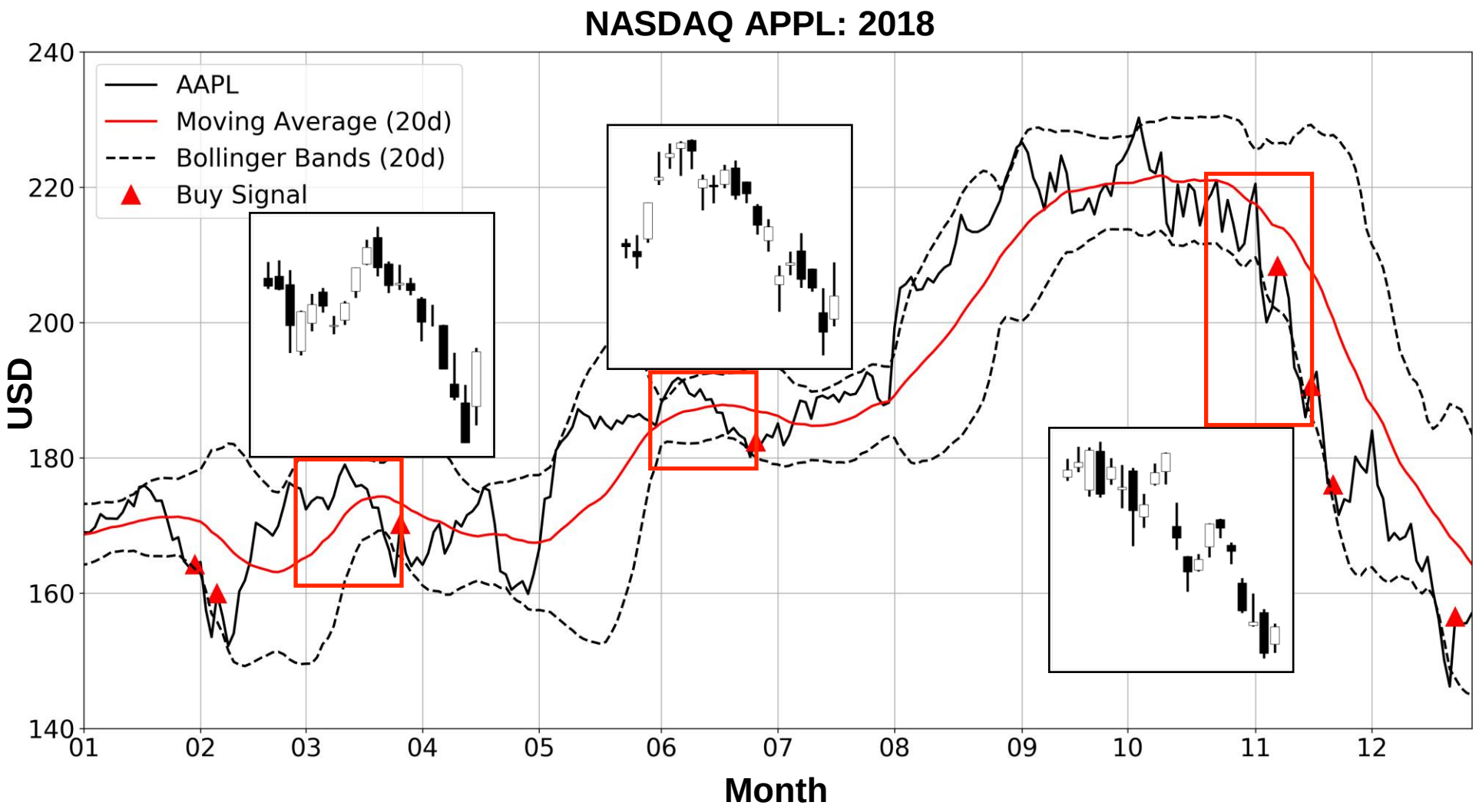
chair
chair
bicycle
person

images


NASDAQ APPL: 2018
AAPL
Moving Average (20d)
Bollinger Bands (20d)
Buy Signal
USD
240
220
200
180
160
140
01
02
03
04
05
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09
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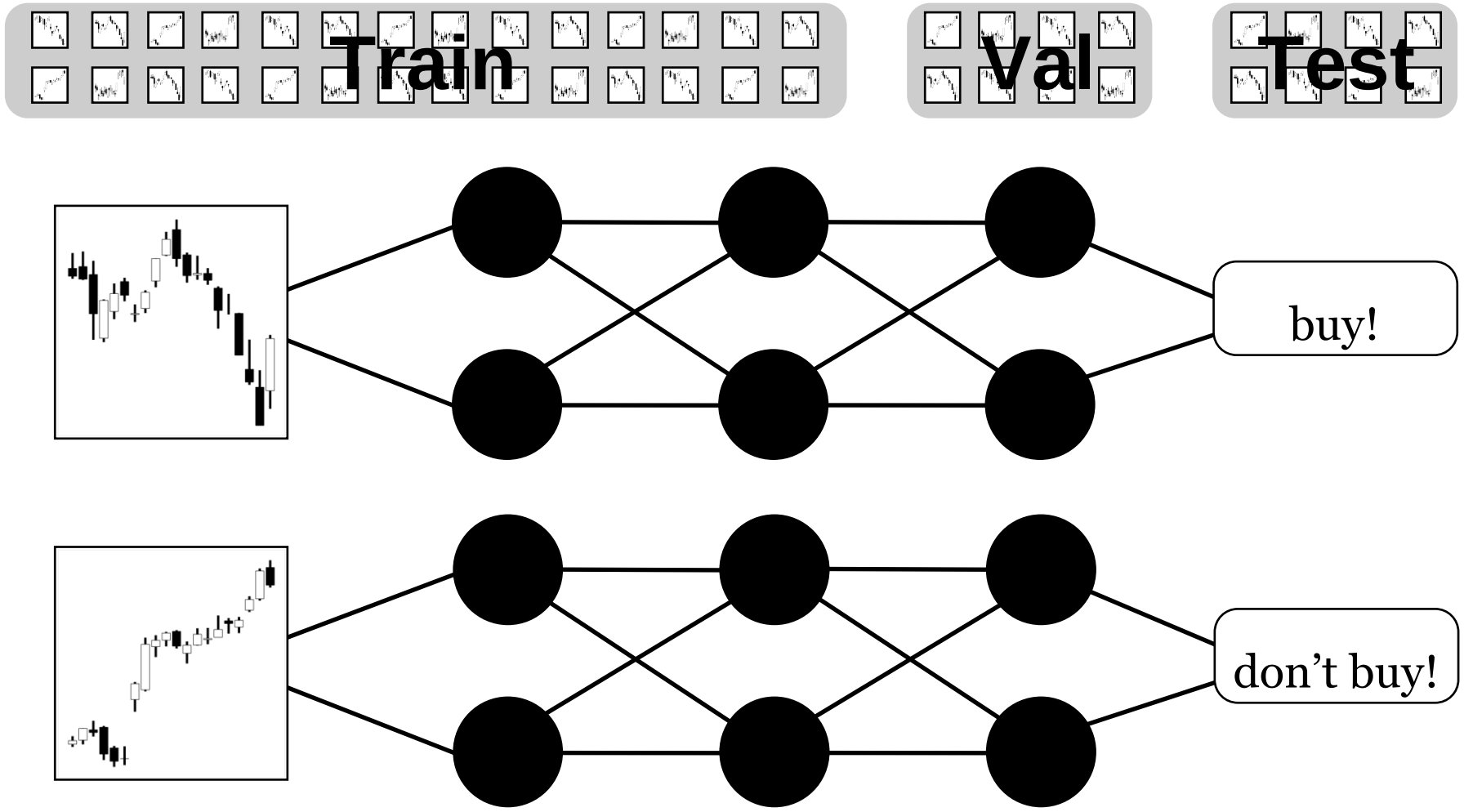
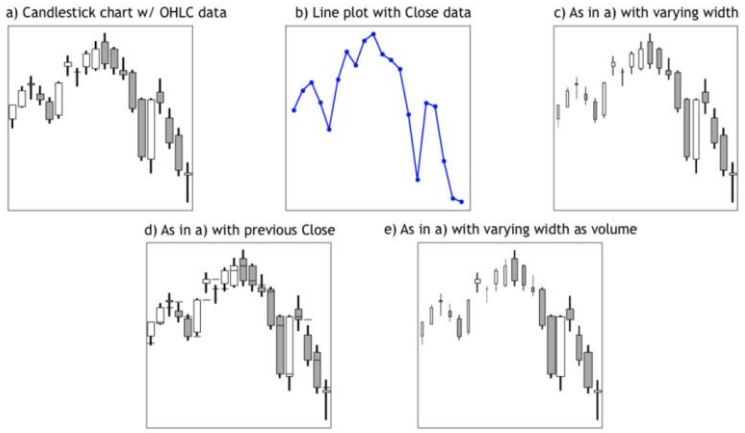
11
12
Month

Images

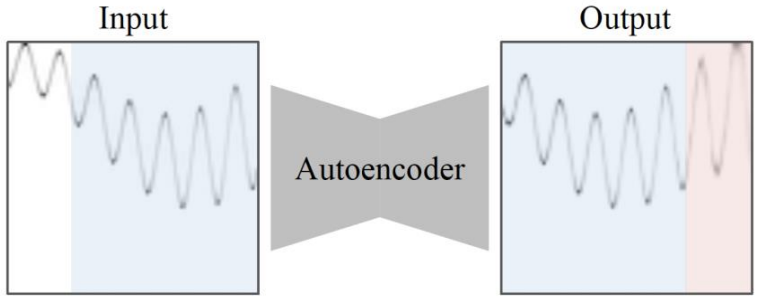


Our model performs at 95% accuracy and 94% precision on historical S&P 500 data

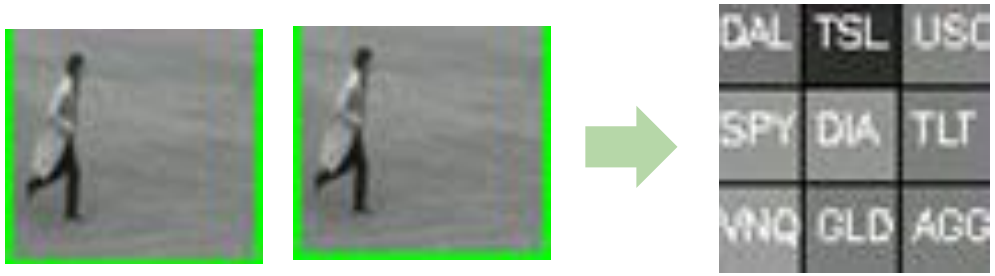
Reasoning through Images



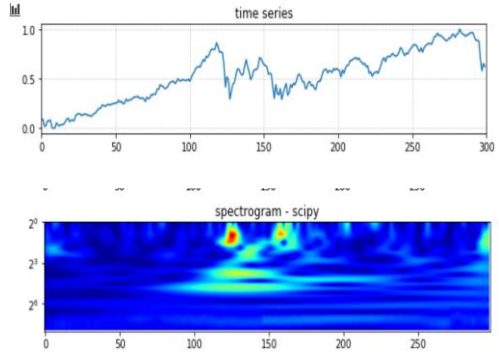
Mondrian-C: Decision-Making Image Classification



Mondrian-P: Time series and Image Prediction

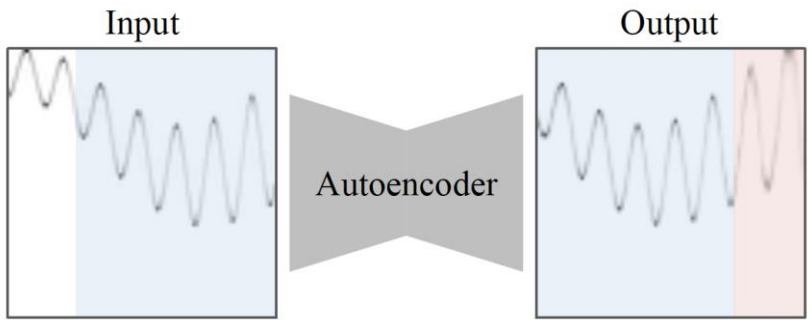


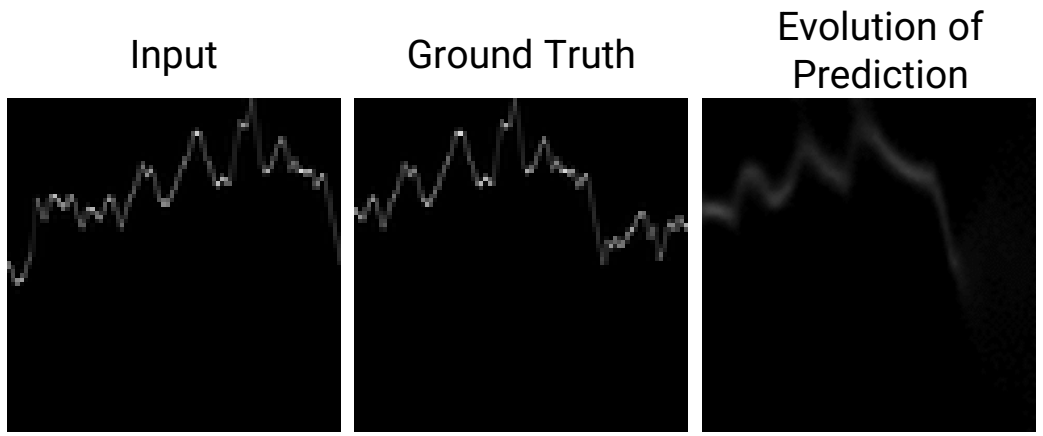
Mondrian-V: Time series and Video Prediction

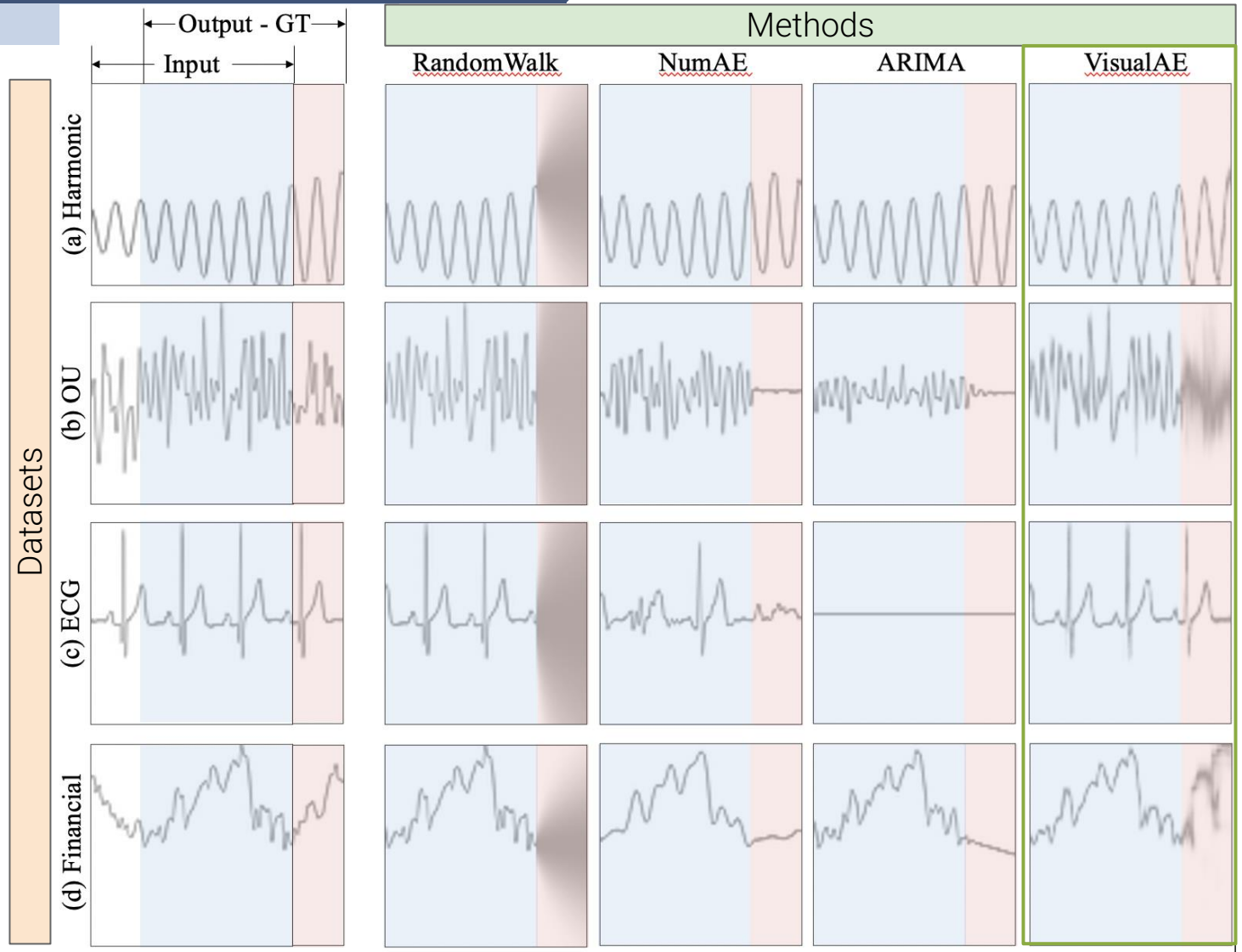


Mondrian-A: Visual Forecasting with Attention

Mondrian-P: Prediction of future time series



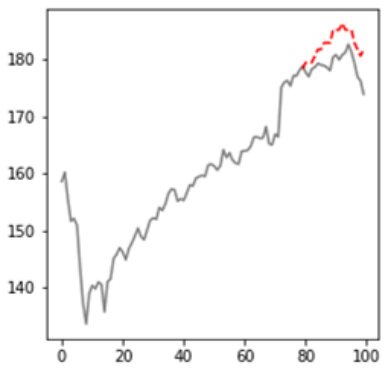
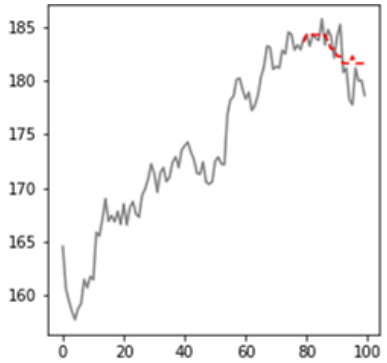
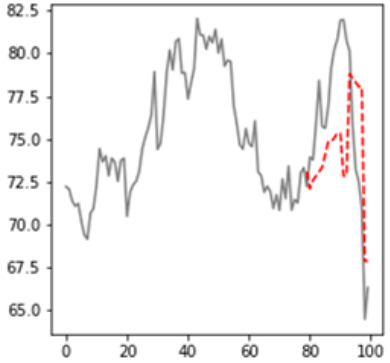
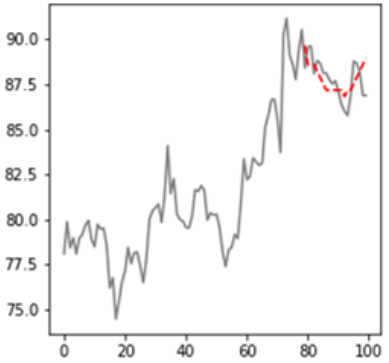
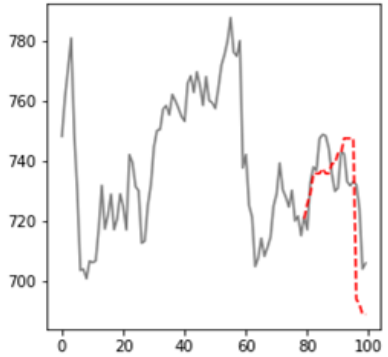
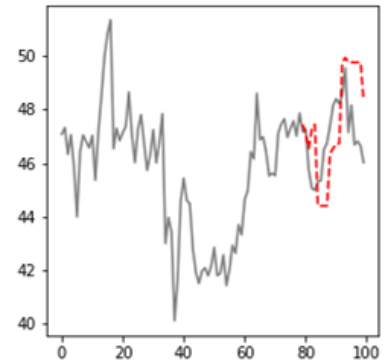
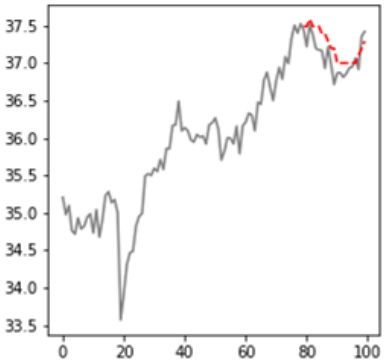
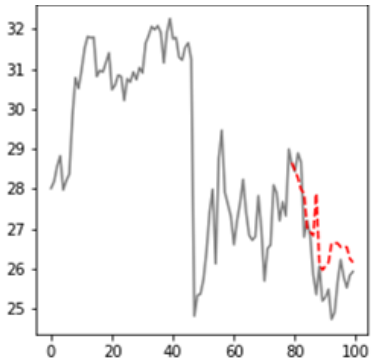
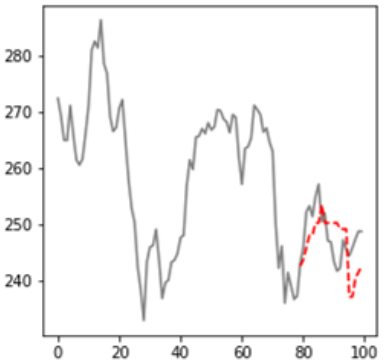
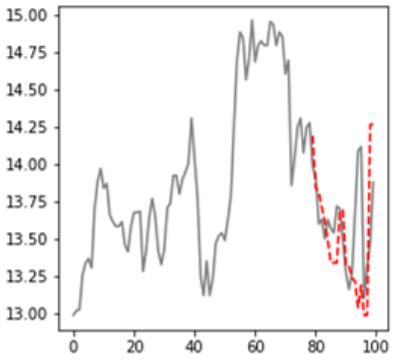
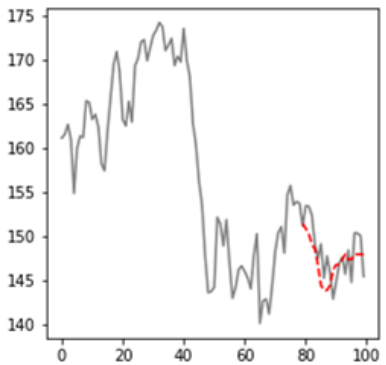
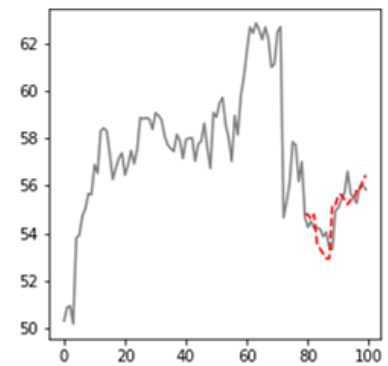
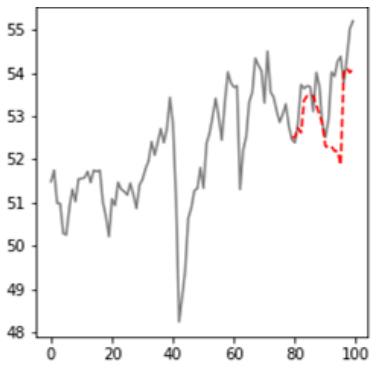
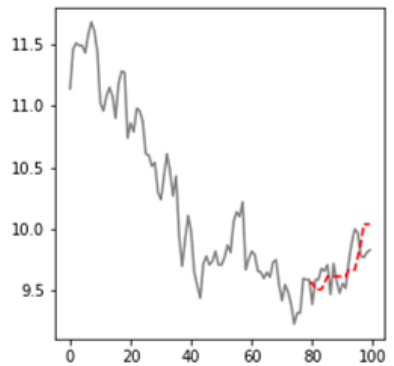
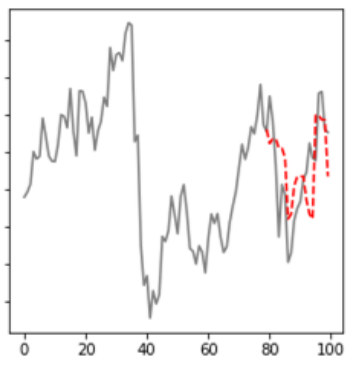




AI RESEARCH

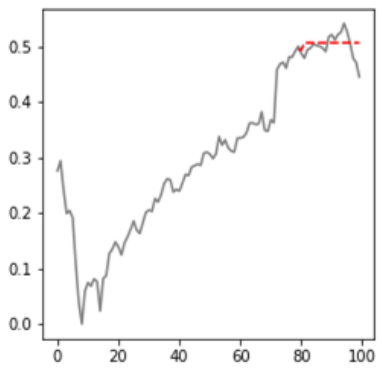
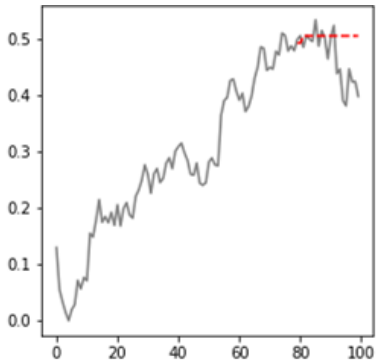
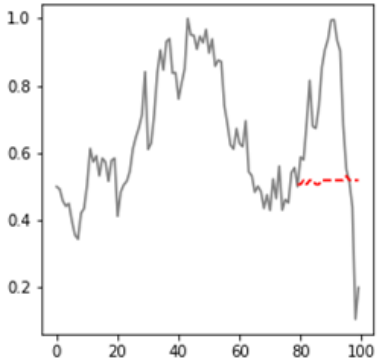
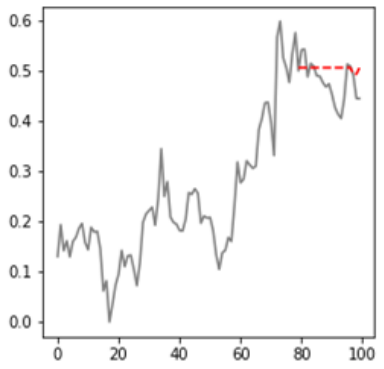
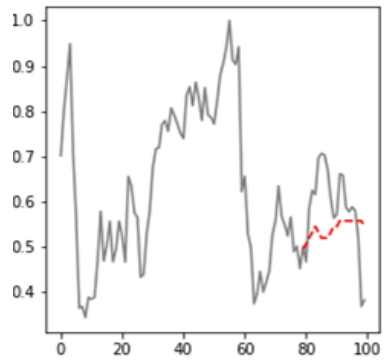
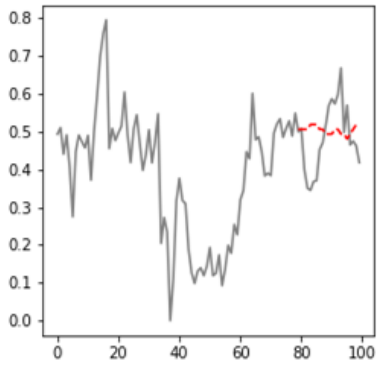
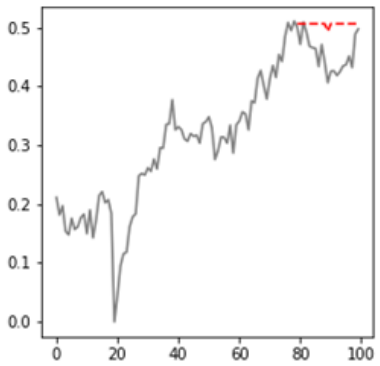
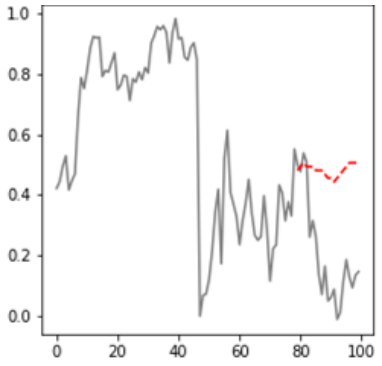
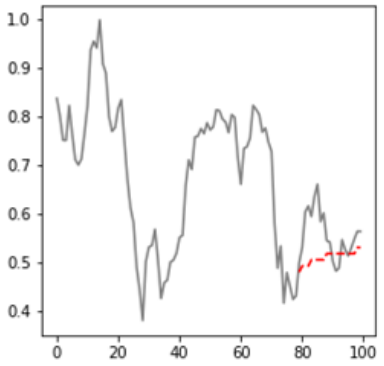
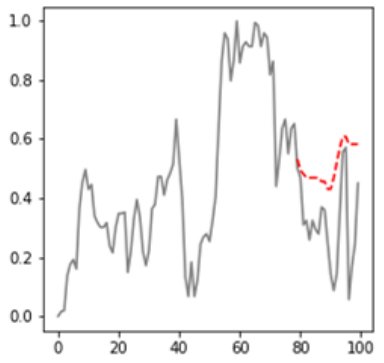
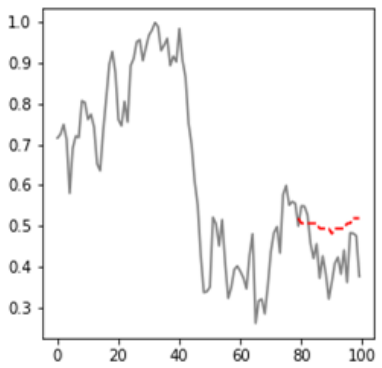
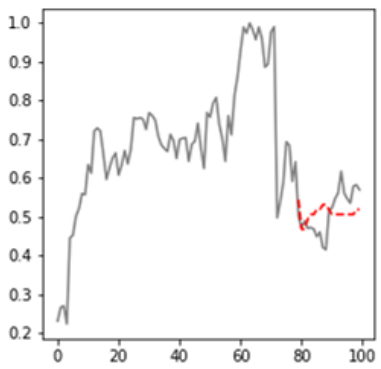
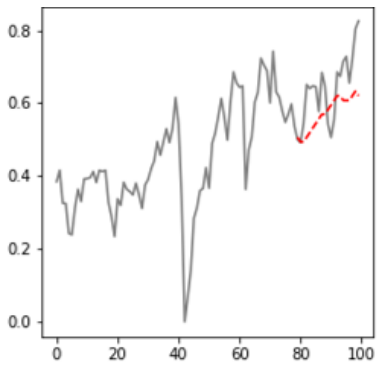
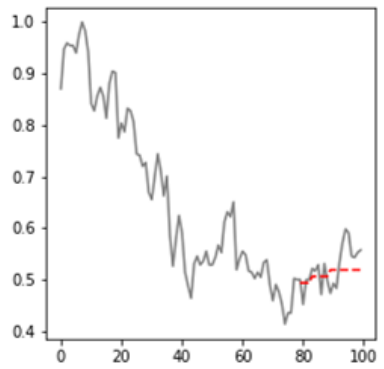
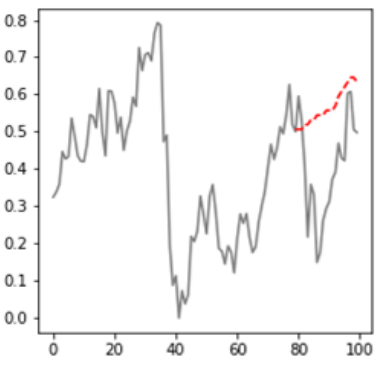
Mondrian (VisualAE) Results

J.P.Morgan
AI RESEARCH

Numeric ML Method Results

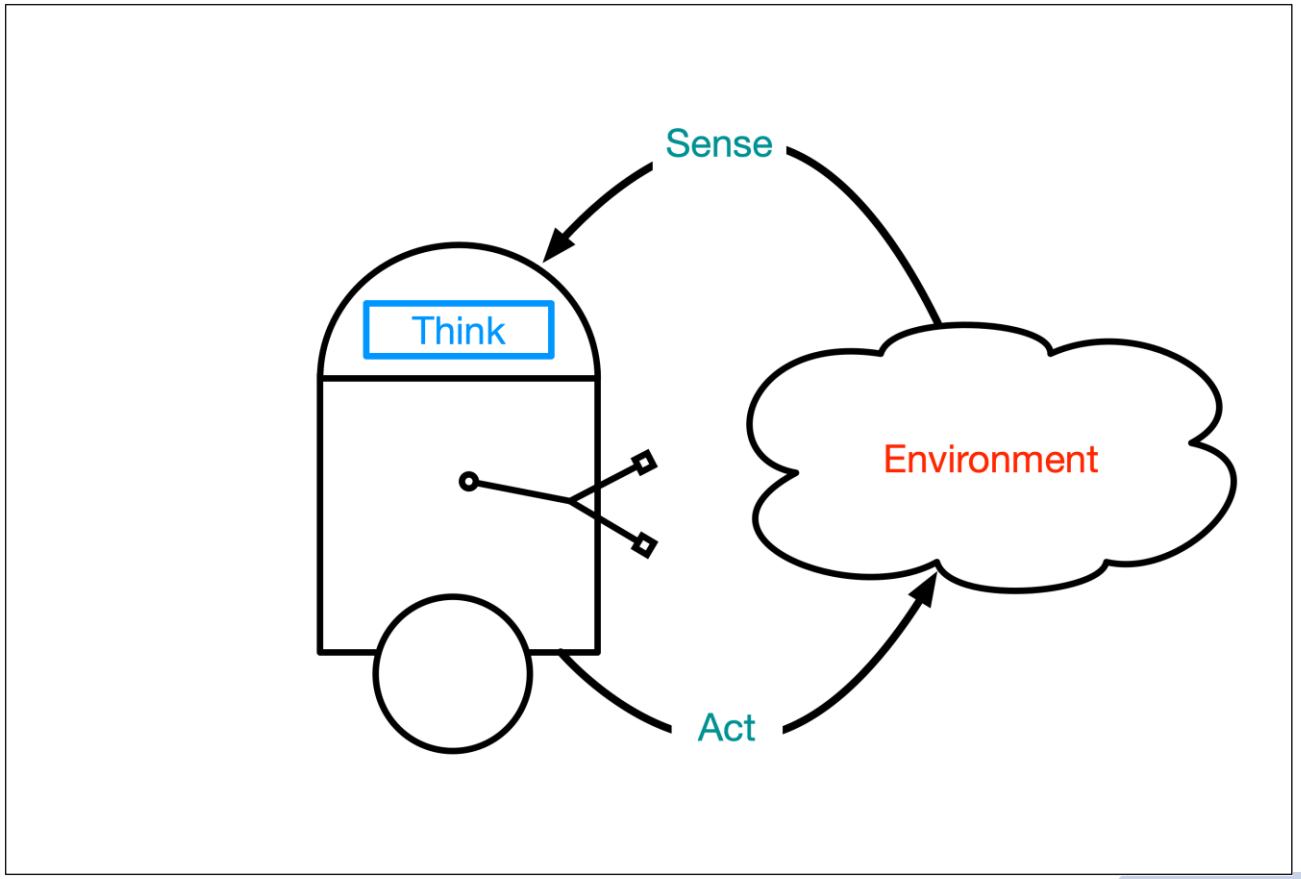
J.P.Morgan
AI RESEARCH

The Sense / Think / Act Cycle

AI software has *agency* to sense think and act:

- **Sensing:** Perceiving the agent's situation.
- **Thinking:** Reasoning about what to do.
- **Acting:** Transforming the environment.



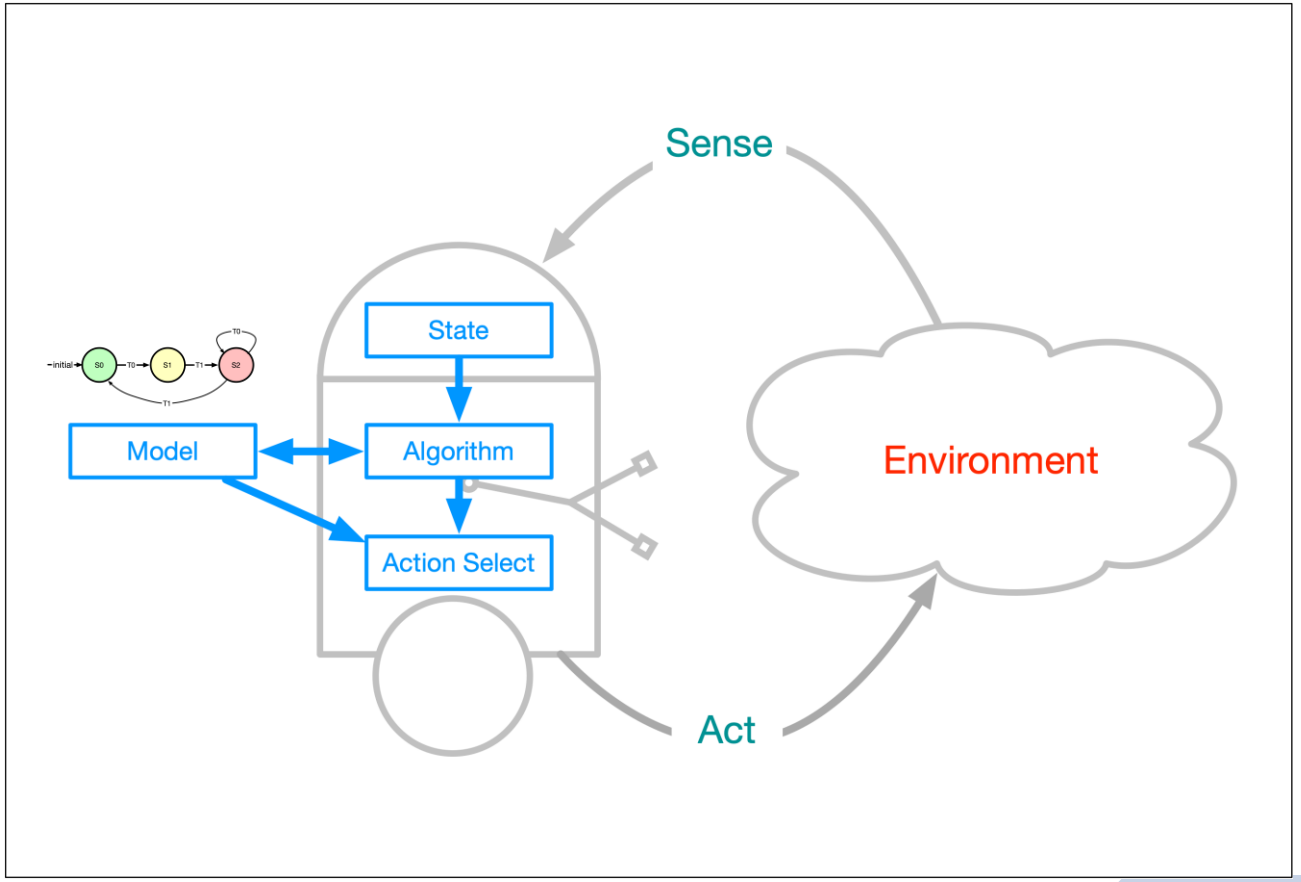
The “Think” Component in Detail

State: The agent’s perception of its current situation.

Algorithm: Method for reasoning about and updating the model (RL, Planning).

Model: A representation of the agent’s “program”.

Action Selection: Selects the best action based on the current Model and State.



How to Evaluate an Agent

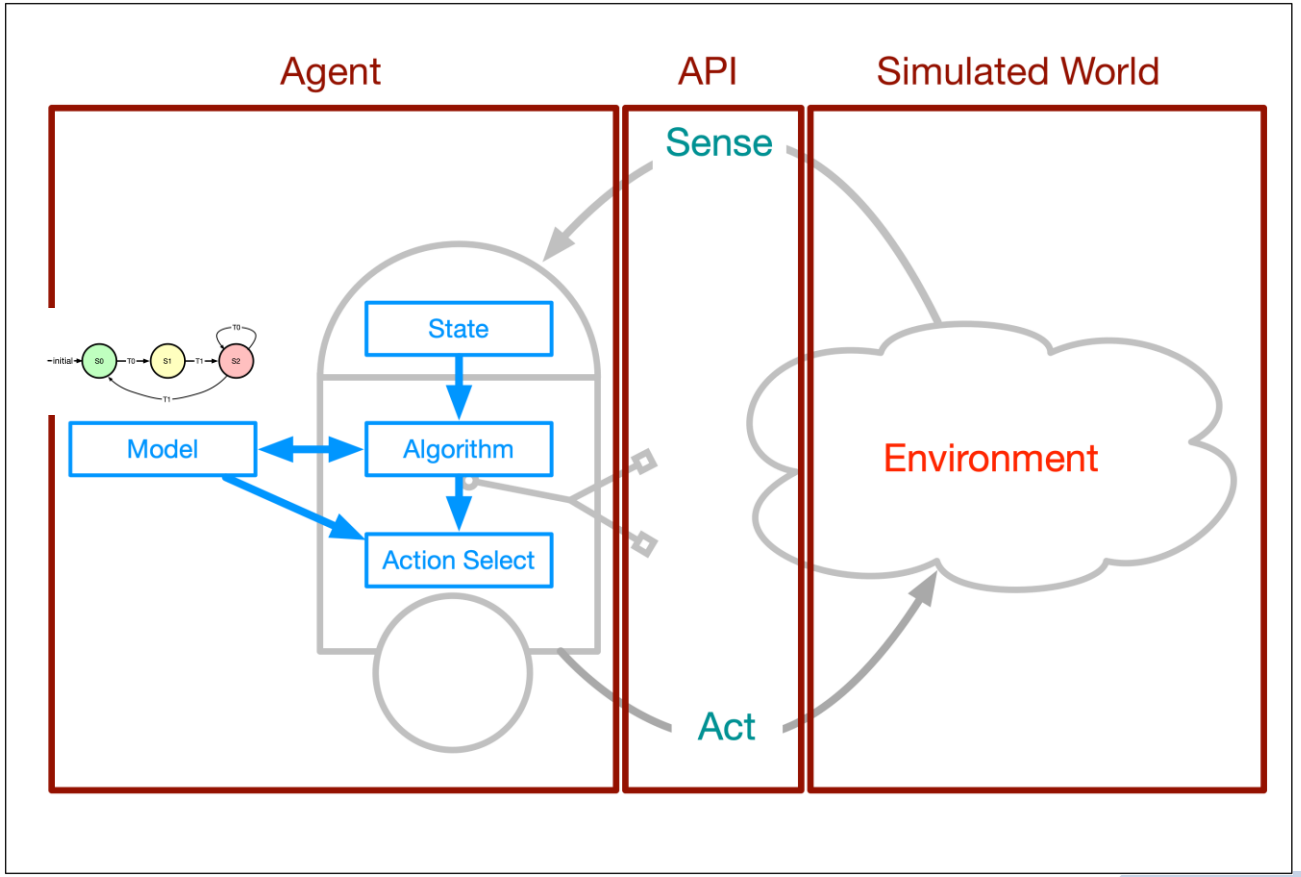
Run in the real world: Risky.

Simulation, separate compnents:

- Agent code and data.
- API.
- Simulated world.

Challenges with simulation:

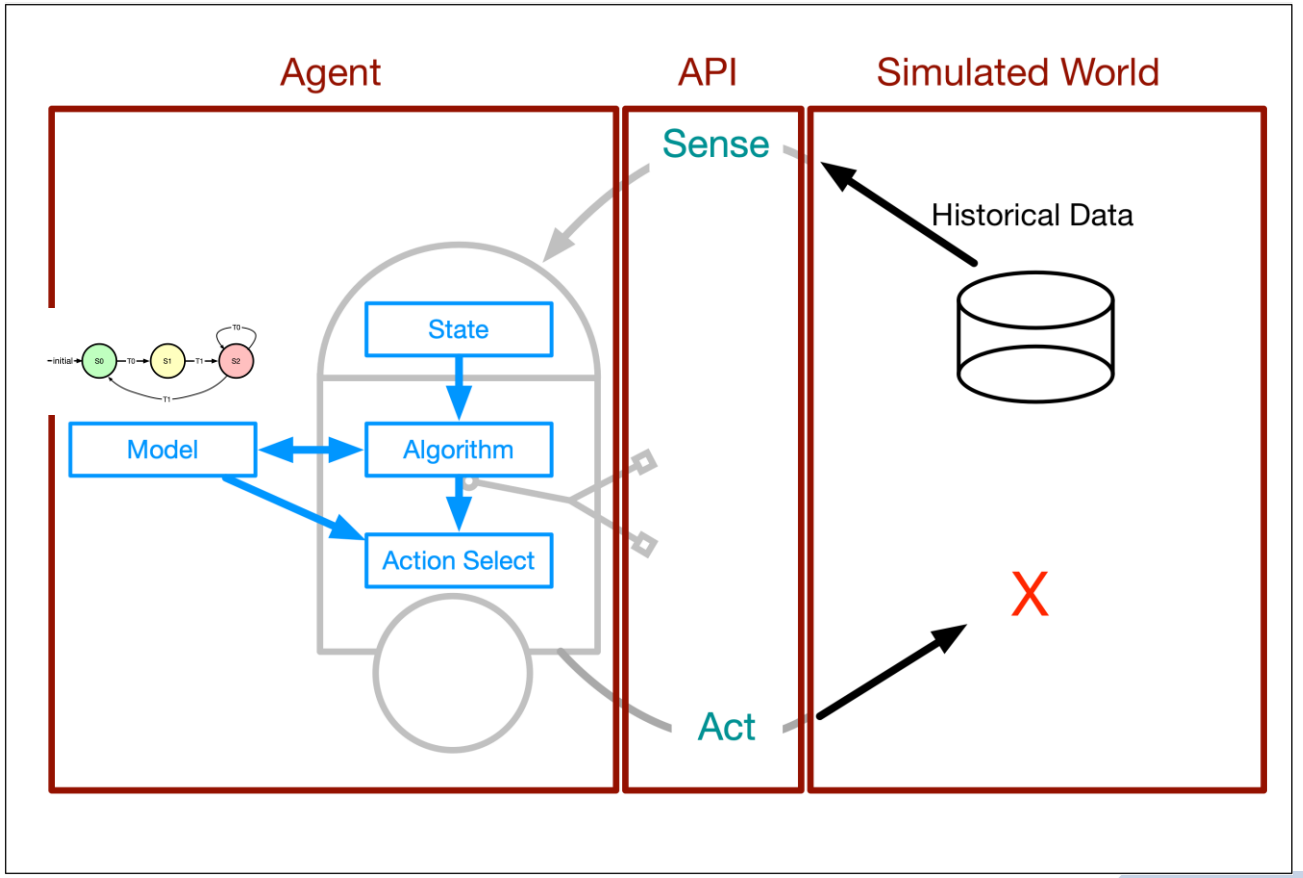
- Accuracy / calibration.
- Efficiency.



Simulation Method 1: Historical Replay

General Idea: Replay historical data (e.g., market prices) to the agent's sensors. Allow agent to respond and learn with respect to this data.

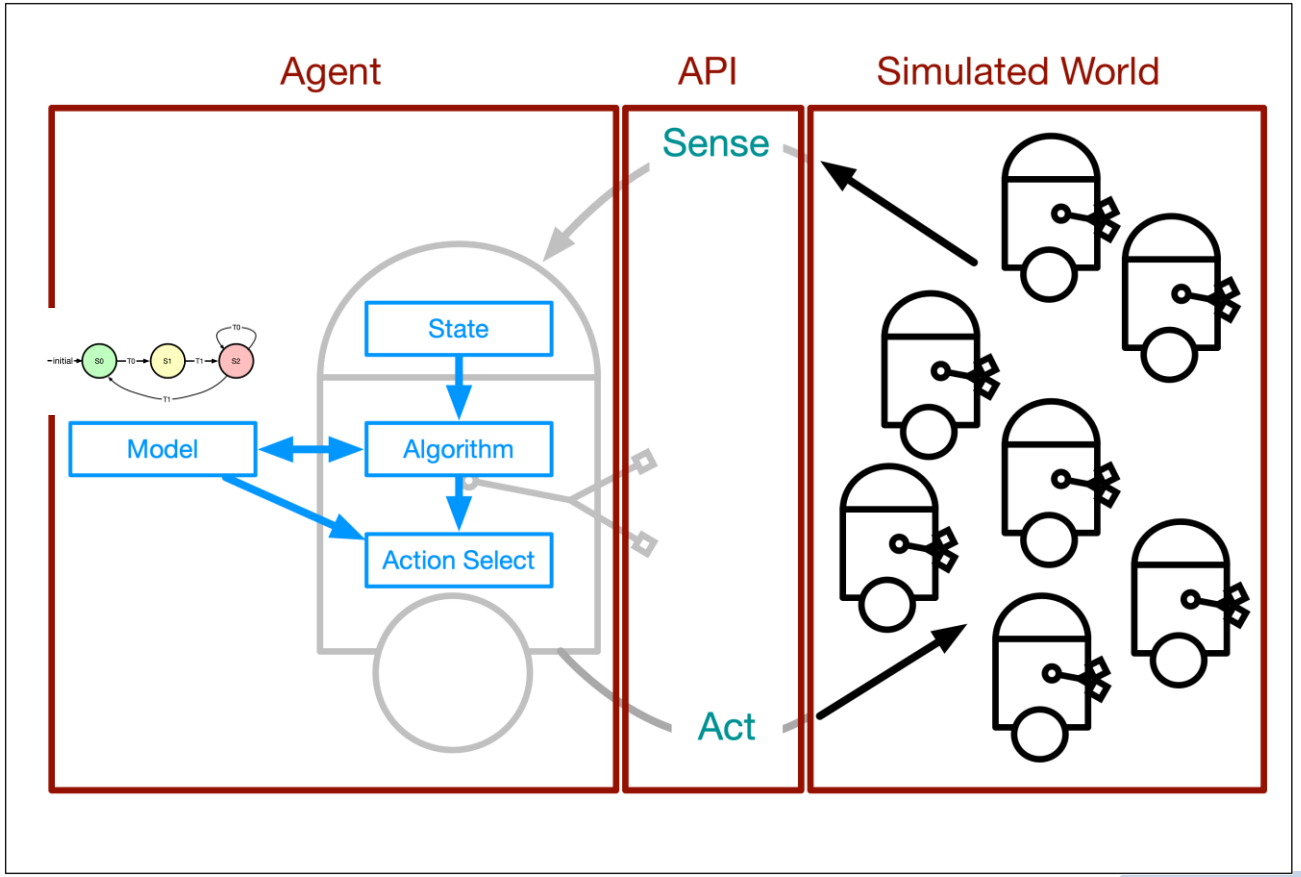
Challenges: The agent's action's don't influence the rest of the world.

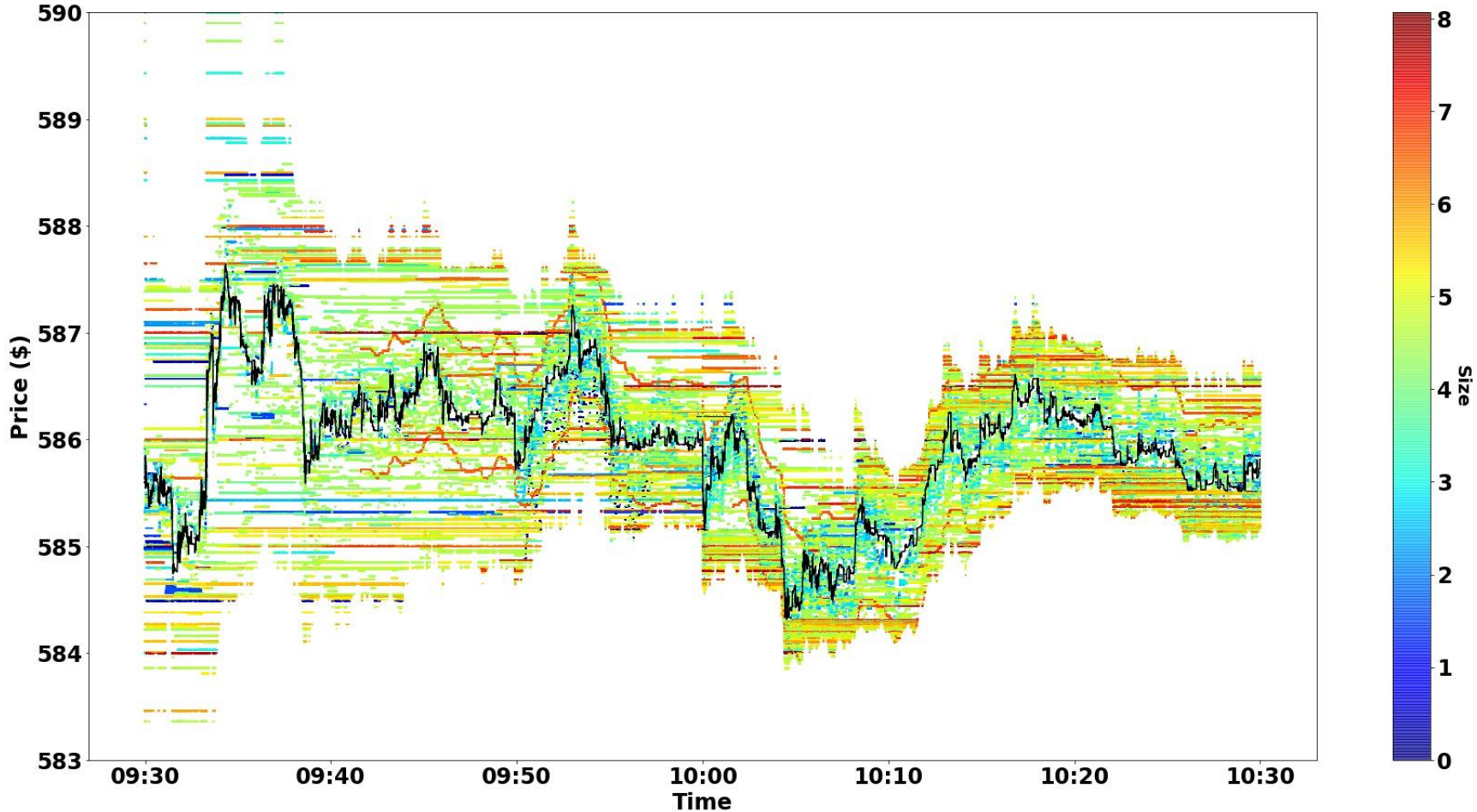


Simulation Method 2: Multi Agents

General Idea: Populate the simulated world with thousands of agents that respond to our agent's behavior.

Interactive and responsive.

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Price ($)
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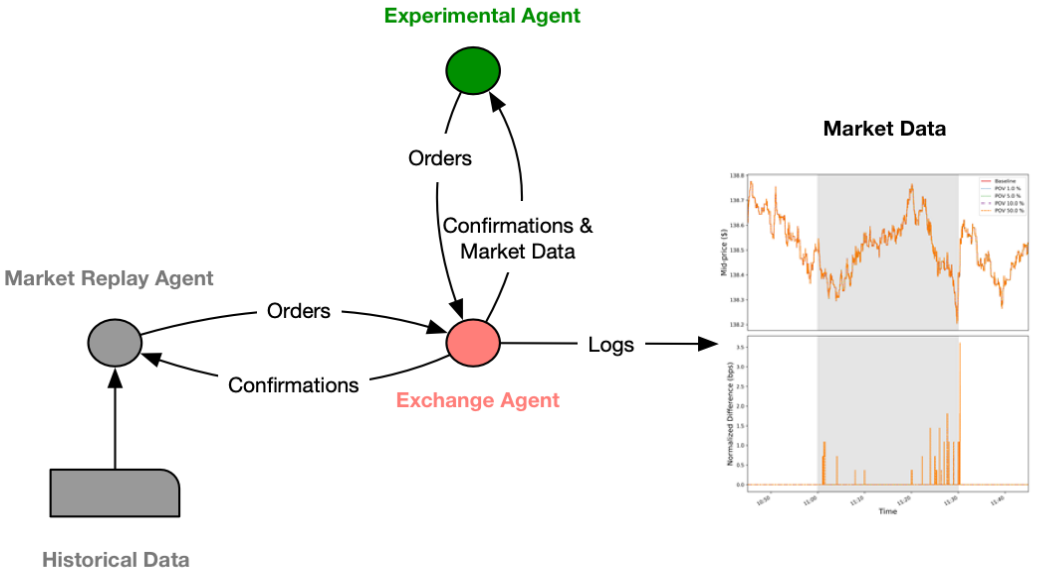
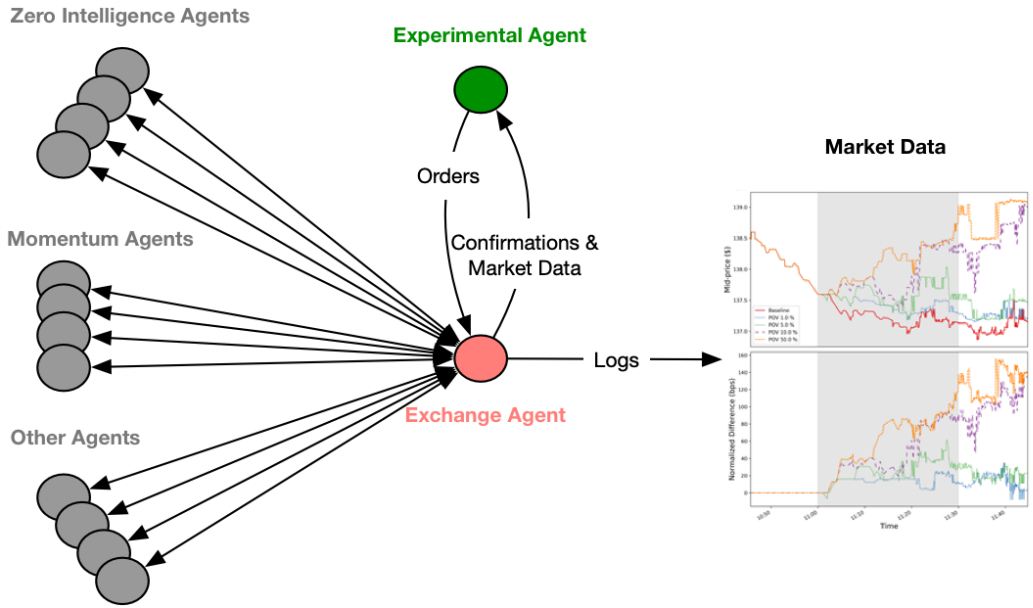
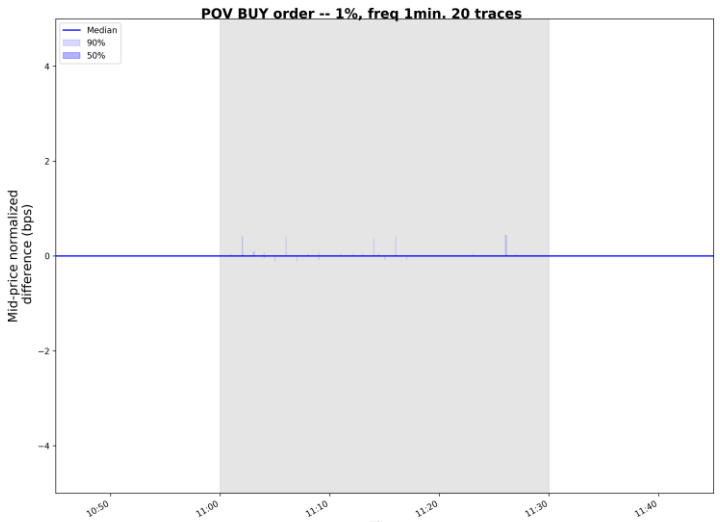
10:10
10:20
10:30
Time
8
7
6
5
4
3
2
1
0
size

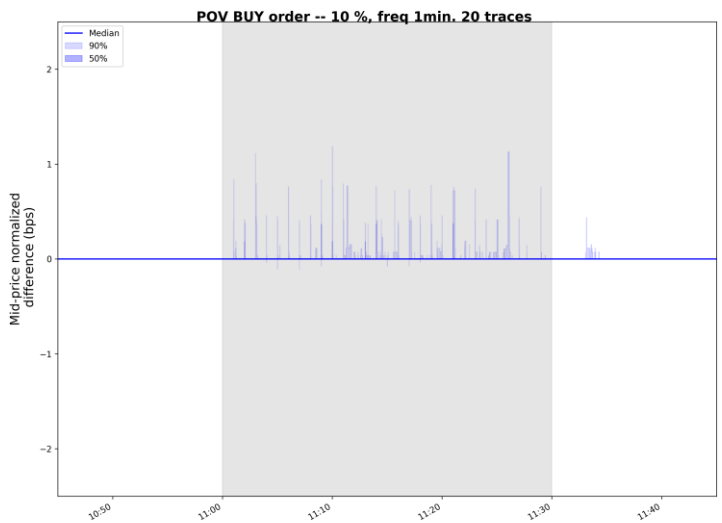
Market Replay vs Multi-Agent Simulation

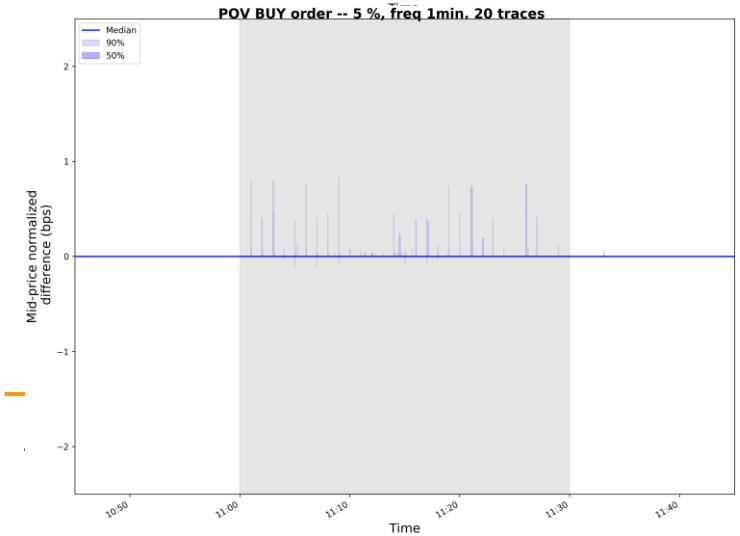


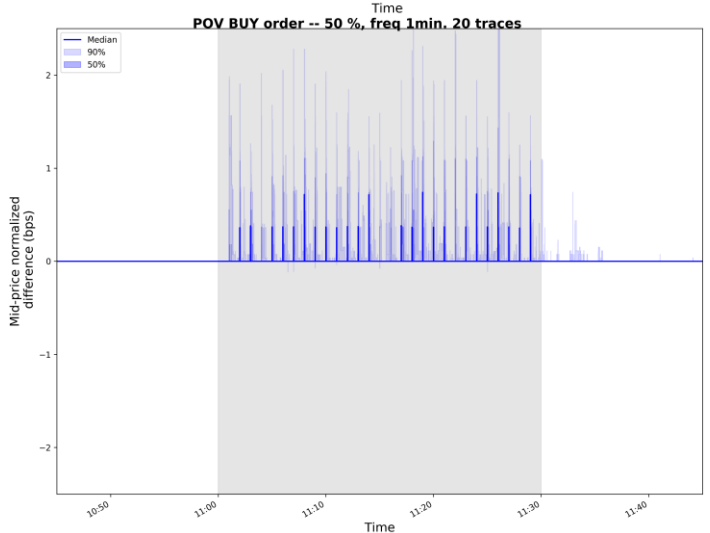


Aggregated Market Impact Experiments: Market Replay





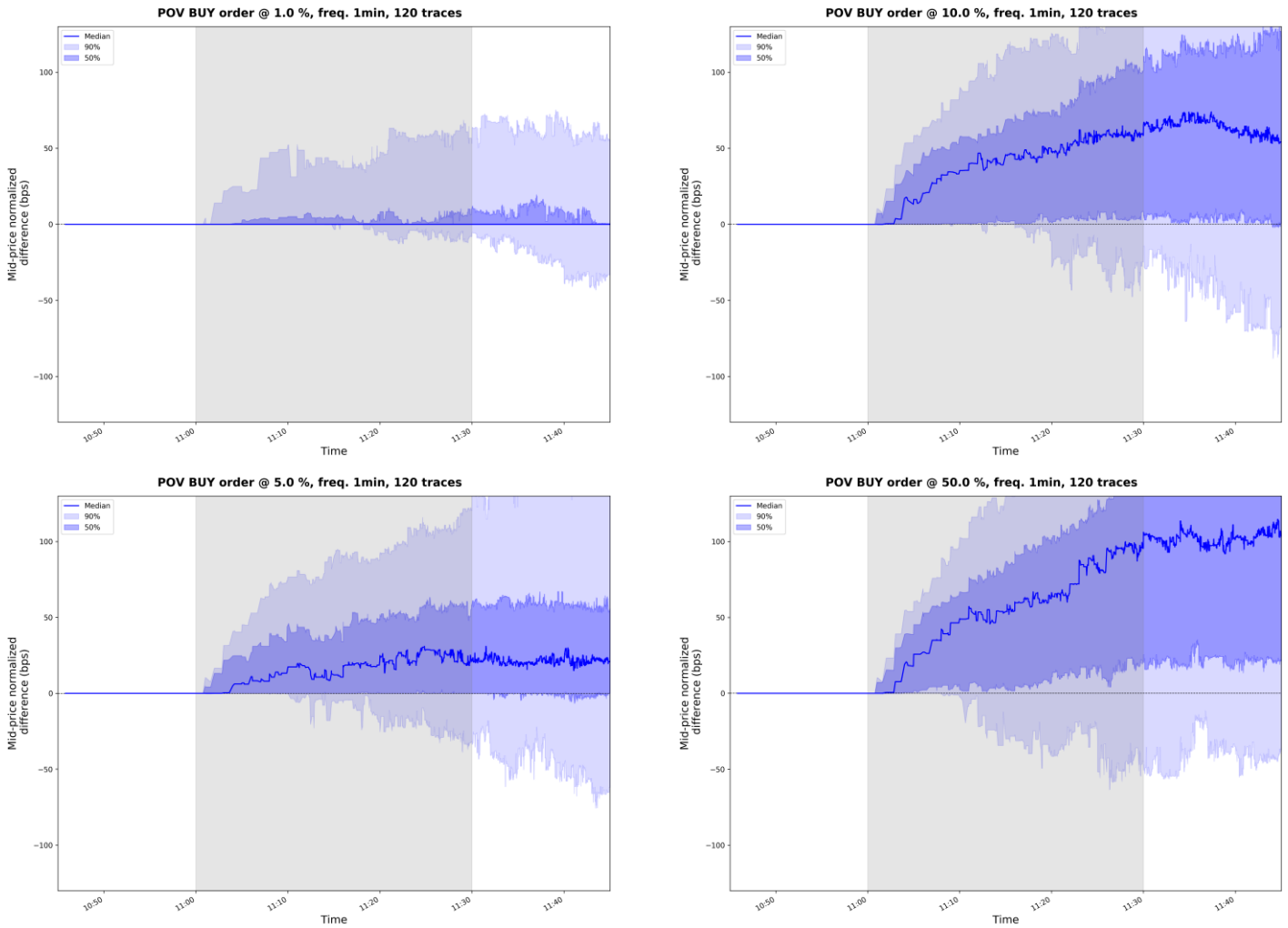




- Replay IBM stock for all trading days in June
- POV buy order at varying POV levels with 1min lookback period is executed over the time period 11:00 – 11:30 and the impact on the mid-price is reported.

J.P.Morgan

Aggregated Market Impact Experiments: ABS

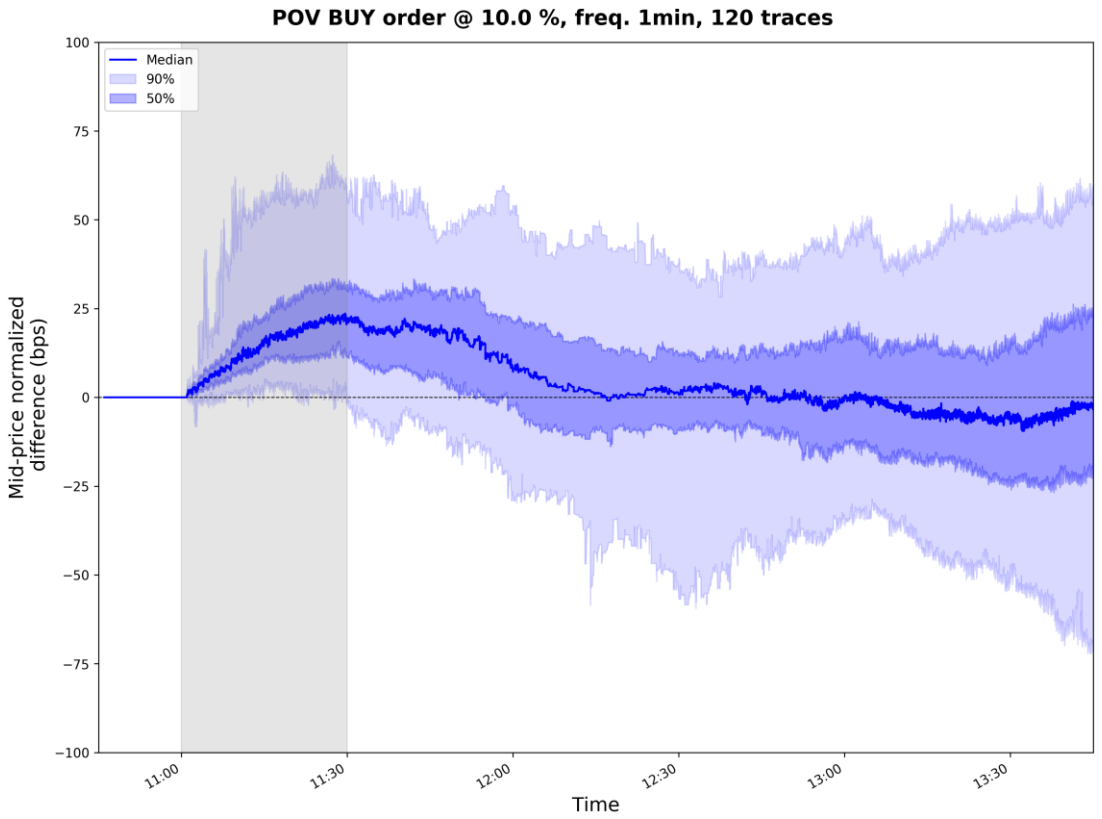


- Simulate IBM stock for all trading days in June
- POV buy order at varying POV levels with 1min lookback period is executed over the time period 11:00 – 11:30 and the impact on the mid-price is reported.
- Does impact persist too long?

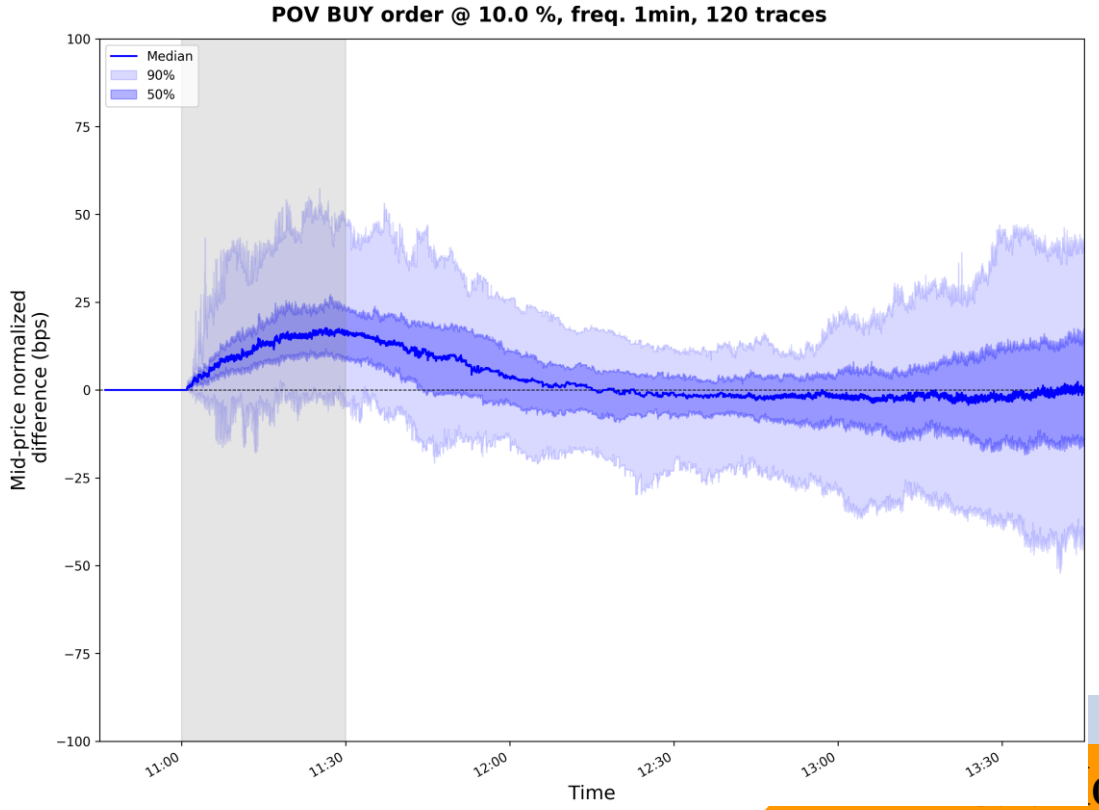
J.P.Morgan

Aggregated Market Impact Experiments: Manipulating Impact Persistence

0.35mHz Value Agent Arrival



0.70mHz Value Agent Arrival



organ

Synthetic Data


Samuel Assefa
PhD - ED, NY


Daniel Borrajo
PhD - Visiting Prof, NY

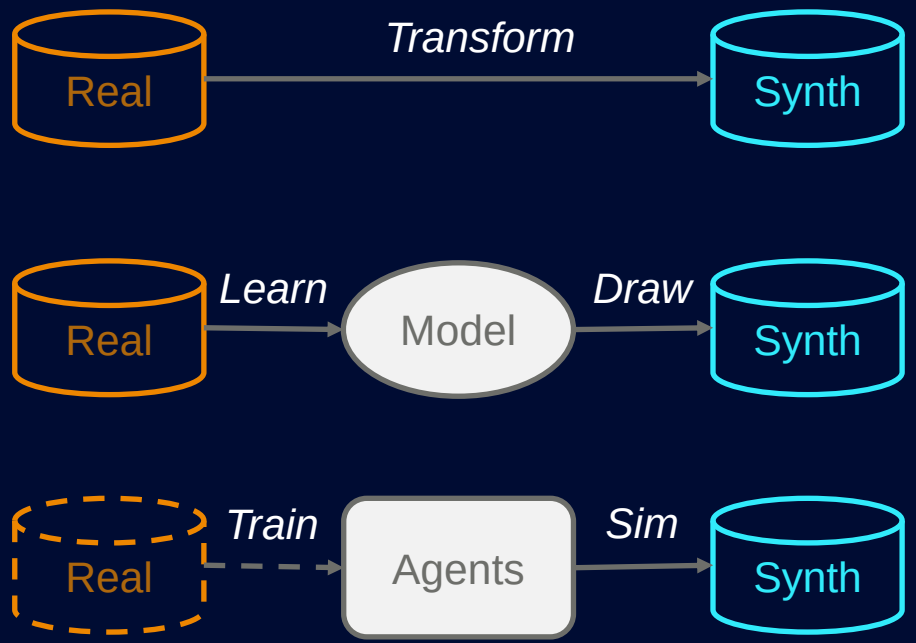

Suchetha Siddagangappa
MS - Assoc, NY


Rob Tillman
PhD - ED, NY


Danial Dervovic
PhD - Assoc, London

- **Problem:** While real data can be very valuable, it may not be easily available
- **Solution:** Synthetic Data Generation

- **Methods** for data generation:
  1. **Pre-generated** datasets –
     a) Through anonymization or other such **point-wise transformation** of real data
     b) Sampling from **learned models**, such as multi-variate probability distributions or GANs
     c) Through **agent-based simulation**
        - Behaviors **trained** using real data, or driven by rules based on **first principles**
     d) Through **planning-based simulation**
        - Behaviors **simulated** using a model of the environment



- **Synthesizer** build -
  - Data **generated dynamically** by rules/models/agents that are configurable
    - Allows for tradeoff between **fidelity to original data** and **privacy constraints**

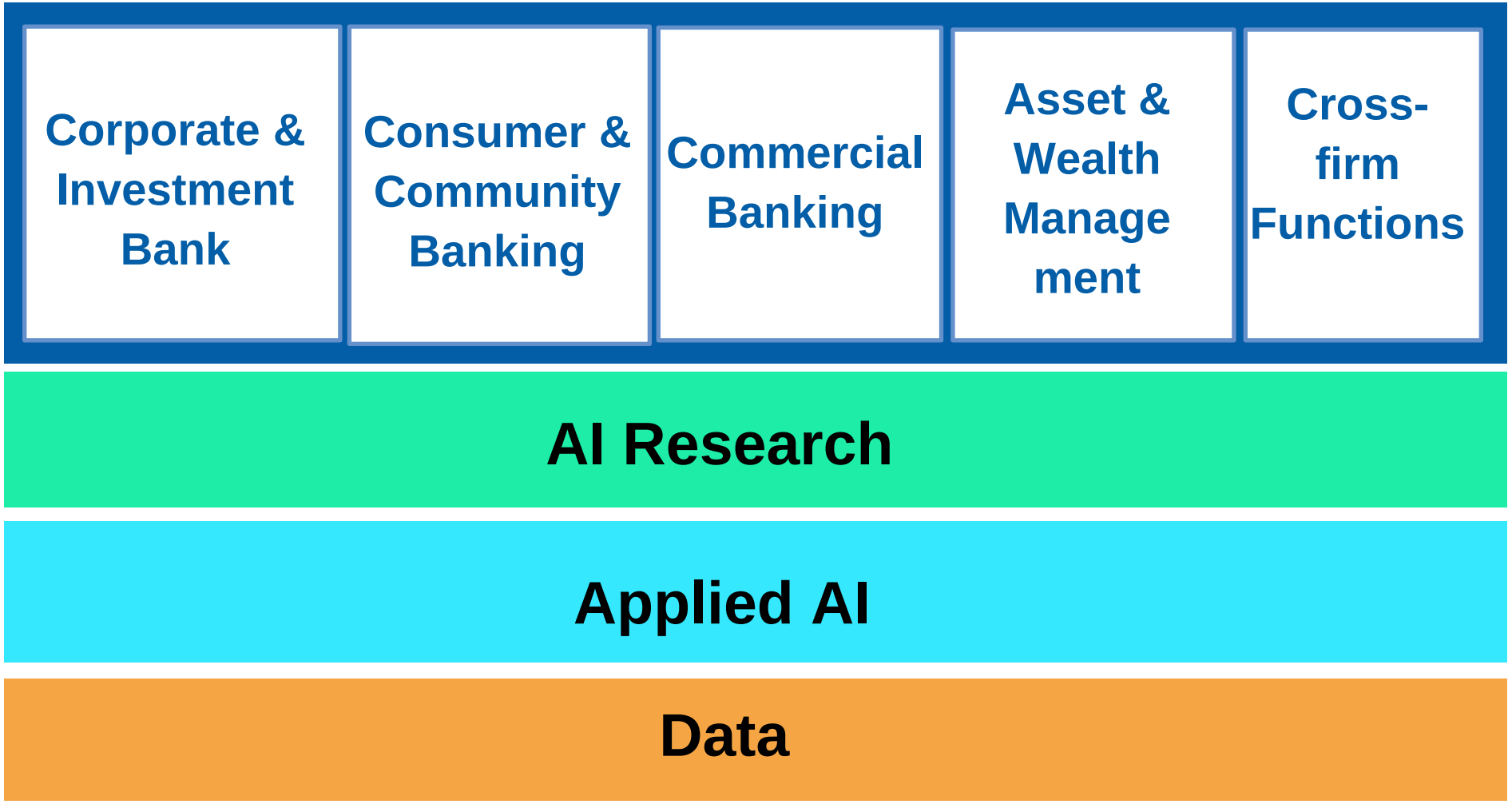
Thoughts on AI Finance Academia

Closing

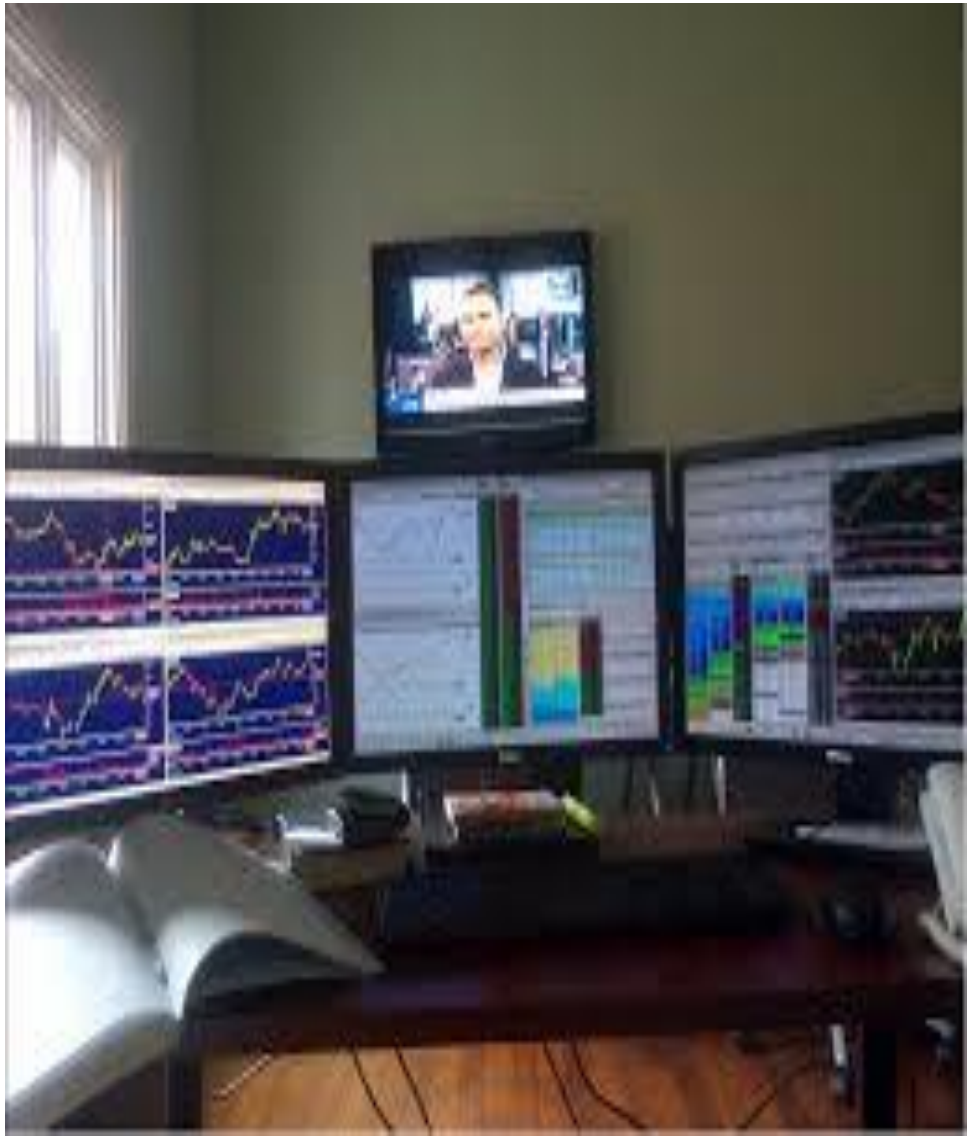
- Upcoming International Conference on AI in Finance: ICAIF'20
  - November 2021
  - https://ai-finance.org
- J.P. Morgan AI Research
  - https://jpmorgan.com/ai

- tucker.balch@jpmchase.com

Business and AI Technology @ JPMC



Trading: Overwhelming *Function* Analysis



PANELIST

GRACE WANG, PH.D.

CFA, Associate Dean for Research, Ying Wu College of Computing

LEIR RESEARCH INSTITUTE CONFERENCE 2021

Academic Overview of FinTech Research

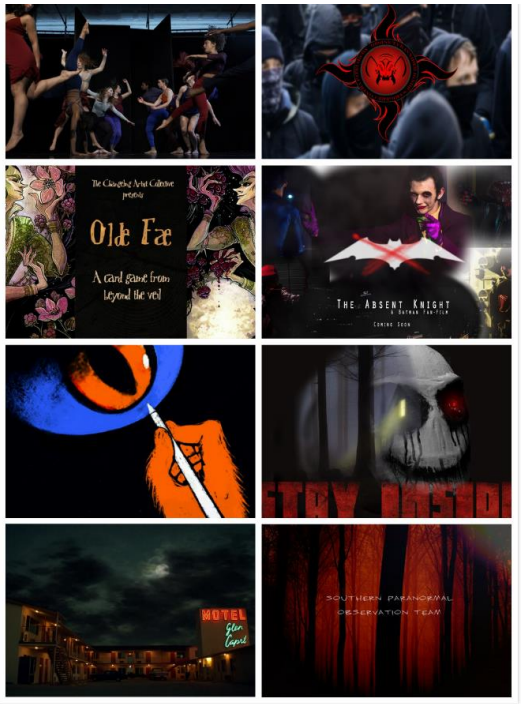
- Dr. Grace Wang
- NJIT

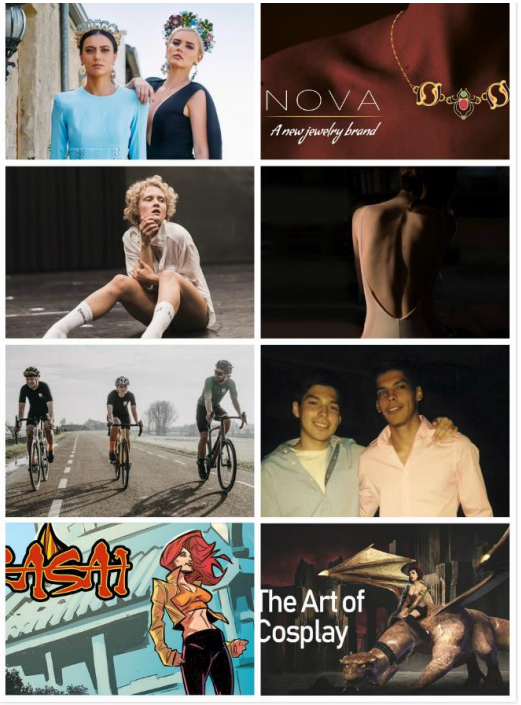
Finance X Technology

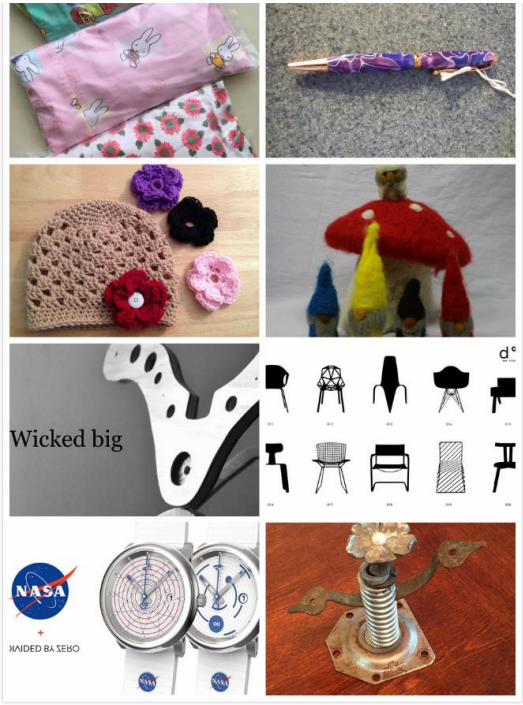
- Crowdfunding
- P2P lending
- Virtual banking, digital banking, open banking
- Mobile payments
- Insurance Tech
- Regulation Tech
- Cryptocurrency
- Market making/trading
- Portfolio management
- ……

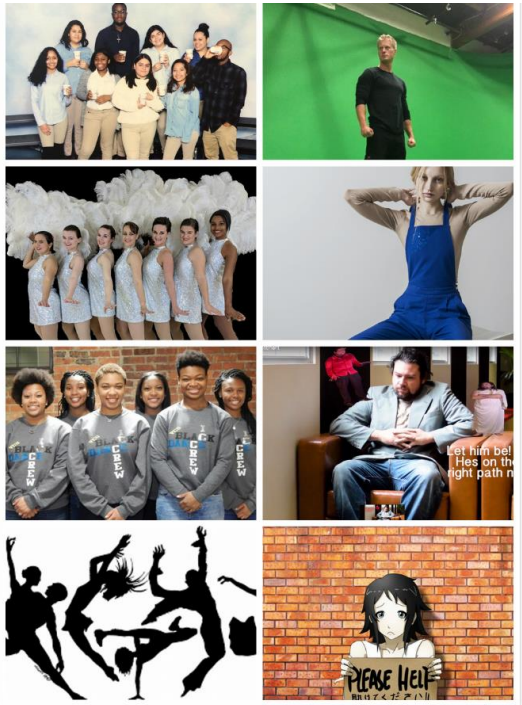
- System/networking/cloud computing
  - Fast speed Internet
  - Mobile and wireless networks
  - Cloud
- Software engineering
- AI
  - Deep neutral networks
  - GAN
  - Reinforcement learning
  - NLP
- Blockchain technologies
  - Public blockchain
  - Consortium blockchain
  - Smart contract
  - …..

Crowdfunding

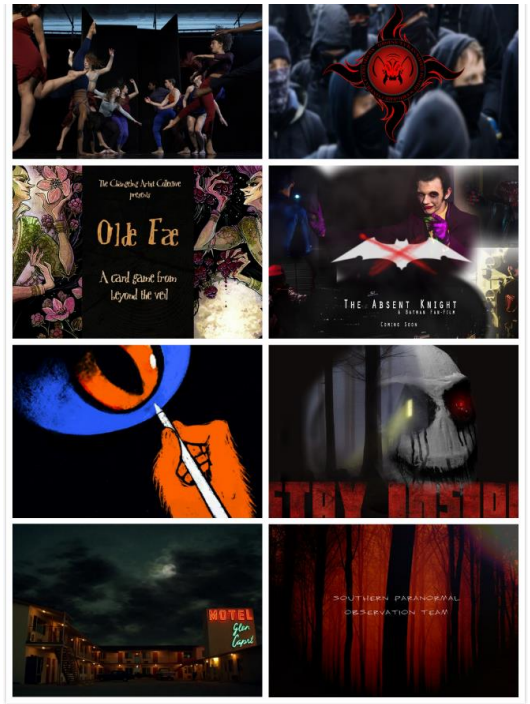




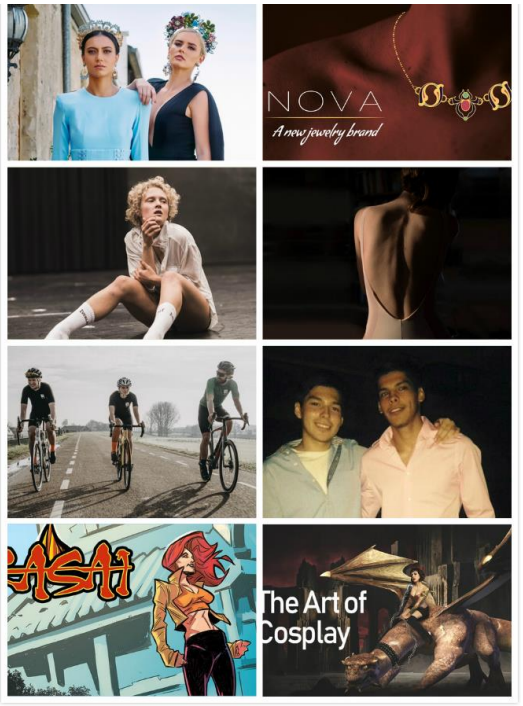




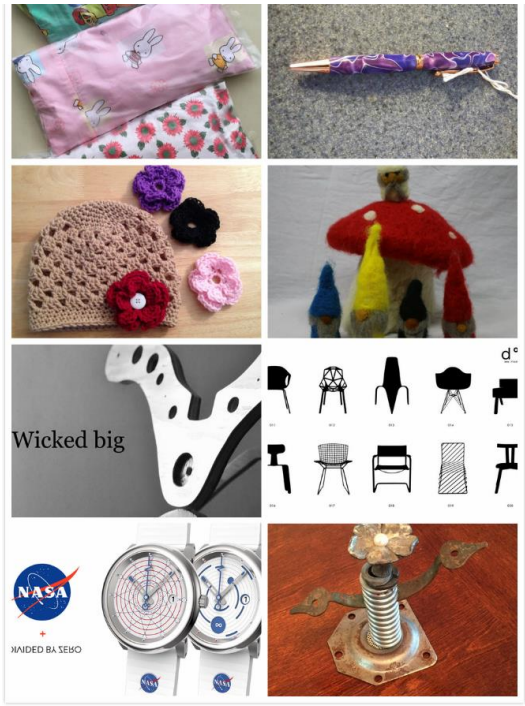
Crowdfunding



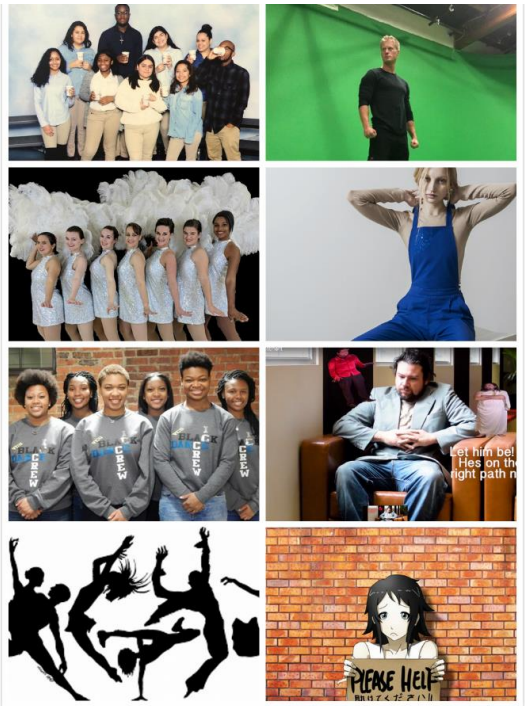
Delight Horror



Bright Dark



Exquisite Rough



Energetic Melancholy

"Examples of profile images on crowdfunding platform Kickstarter. For each case, images in the left column are from the successful projects, while the ones in the right column are from the failed projects. There is clear difference in visual style between successful and failed projects." from "Success Prediction on Crowdfunding with Multimodal Deep Learning", published in IJCAI 2019

What helps your crowdfunding project language-wise

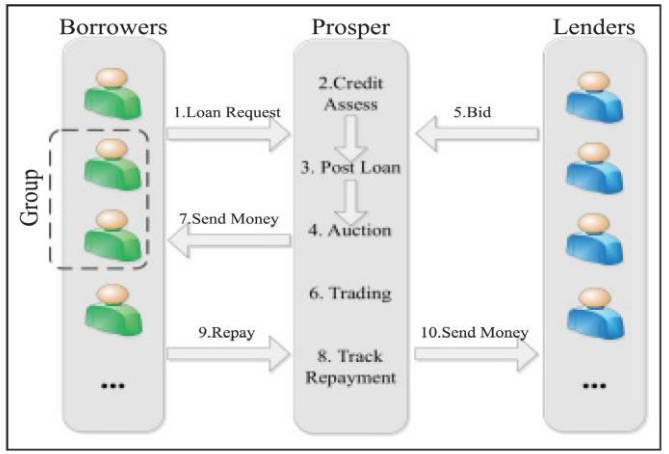
Group	Phrase list
Reciprocity	free shipping, you receive, early bird, be the first, your reward
Social	friends, friendship, community, and family, his family, people
Emotion	passion, dream, inspired to start, believe that, impact, volunteer
Thankful	thank you, so thankful, thanks, thanks so much, grateful, grateful for your
Pitch	why support, funds will cover, will be used, aiming to, aim to raise
Collective	help us, we can, we raise, we plan to, we need, we found, we created

Table 4: Phrases in project descriptions most predictive of successful Kickstart projects, grouped

- Based on a study by Stanford Univ. on 26000 projects

P2P lending

- AI: decision making in approving the loans
- Crypto-backed P2P lending
- Examples: MakerDAO



(a) Prosper

MAKER

Compound

Platform	Prosper	LendingClub	Zopa	Renrendai	Kiva
Country	USA	USA	UK	China	USA
Area	USA	USA	UK	China	World-wide
Founded	2005	2006	2005	2010	2005
Data Release	Nov 2015	Dec 2016	Nov 2015	Mar 2015	Nov 2015
Loans	$5 billion	$24.6 billion	£1.18 billion	CNY 720 million	$781 million
Members	2,000,000	Unknown	213,000	1,500,000	1,351,777
Charge fees	Yes	Yes	Yes	Yes	No
Category	General Auction(early) Lending-based	General Fundraising Lending-based	General Auction Lending-based	General Fundraising Lending-based	Professional Fundraising Lending-based

Virtual banking:

What is new? What are the challenges?

- What needs to be accomplished when no physical branch?
  - Authentication
  - Customer query
- How AI can help
  - Human computer interaction through Reinforcement Learning
  - Intelligent authentication through deep learning or machine learning
    - ✓face recognition, liveness detection, voiceprint, iris print, etc
  - Intelligent lending decisions to SME: how to determine the risk?
    - ✓deep learning, machine learning, federated learning, data mining can all help

InsurTech

- InsurTech redefine insurance value chain through technology
- In 2018, Global InsurTech Investment > US$ 4 billion
- Insurance industry:
  - Product and pricing: how to study the market, the need
  - Marketing: how to answer people's questions
  - Claims: how to prevent and detect fraud
  - Service and operation: paperless sales proves; automated underwriting and claims payment; flexible termination and modification of policies

InsurTech

- Ecosystem:
  - Accident and health
  - General liability
  - Property damage
  - Motor vehicle
  - Pecuniary losses
  - Others
- Core technologies: AI, Blockchain, Cloud Computing, Big Data

InsurTech – 4 core advantages

- Customized products
  - Scenario-based
  - Small-ticket size
  - Tailored coverage
  - Quick-to-market
- Dynamic pricing
  - Real-time dynamic pricing underwriting
  - Accurate pricing
  - Optimized risk assessment
- Scenario-based sales
  - Embedded into ecosystems
  - Direct to customers
  - Cross-ecosystem sales
- Automated claims
  - Highly automated
  - AI-enabled fraud detection
  - Faster and more convenient

Regulation Tech

- Why?
  - There are around 200 regulatory revisions to keep track of daily
  - Regulatory fines exceeding US$320 billion have been issued since 2008 – 2017
- RegTech is a sub-set of FinTech that focuses on technologies that may facilitate the delivery of regulatory requirements more efficiently and effectively than existing capabilities
- Regulation requires:
  - Regulatory reporting, risk management, identity management & control, compliance,
  - transaction monitoring and AML: anti-money laundry
  - KYC: Know Your Customer for account opening
  - sanctioning & PEP (politically exposed person) screening → name screening
  - Fraud detection

Trading and portfolio management

- How to detect anomaly?
  - WSB phenomena: can NLP help detect the sentiment?
  - How to do aspect-based reasoning to interpret news?
  - ……

Payment Ecosystem

Processors/Acquirers
Underwrite and own the merchant account and provide hardware

- First American Payment Systems
- vantiv
- citi
- First Data
- Wells Fargo
- TSYS
- FIS
- globalpayments
- Heartland Payment Systems
- Barclays
- fiserv.
- Elavon

Issuers
The banks that provide the credit cards to cardholders

- Bank of America
- citibank
- HSBC
- TD Bank
- Barclays
- Chase
- PNC
- usbank
- American Express
- Wells Fargo

Gateways
Authorize online credit card payments

- NMI – Network Merchants Inc – nmi.com
- BluePay
- stripe
- wepay
- sagepay
- Authorize.Net
- PayPal
- Klarna
- Optimal Payments
- worldpay
- Braintree

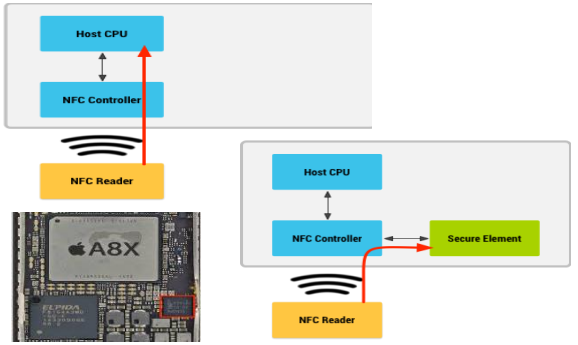
ISOs/MSPs
Partner with processors to open merchant accounts & manage support

- payscape
- The Transaction Group
- openedge
- EVERLINK
- Paywire Incorporated
- VersaPay
- PowerPay
- Merchant Warehouse
- NorthAmerican Bancard
- Square
- total merchant services

Card Networks

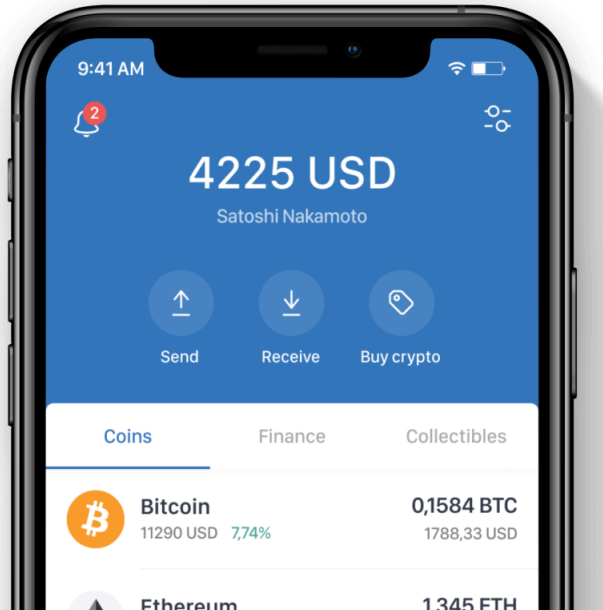
- American Express
- VISA
- JCB
- DISCOVER
- MasterCard
- Chase Sapphire
- Interac

Company	Active users	Latest figures from
WeChat	1 billion+	Tencent (Jan 2019)
Alipay	1 billion+	Alipay (Jan 2019)
Paypal	250 million	PayPal (Sep 2018)
Apple Pay	383 million	Loup Ventures; QZ (Feb 2019)
Amazon Pay	50 million	Evercore ISI, Investopedia (May 2018)
Samsung Pay	1 billion+	Statista (Aug 2017)
Google Pay	24 million	Statista (Aug 2017)



Technical background on card Emulation

- Host card emulation (HCE)
- Secure Element (SE)



Thank you!

PANELIST

QIANG TANG, PH.D.

Senior Lecturer, University of Sydney

LEIR RESEARCH INSTITUTE CONFERENCE 2021

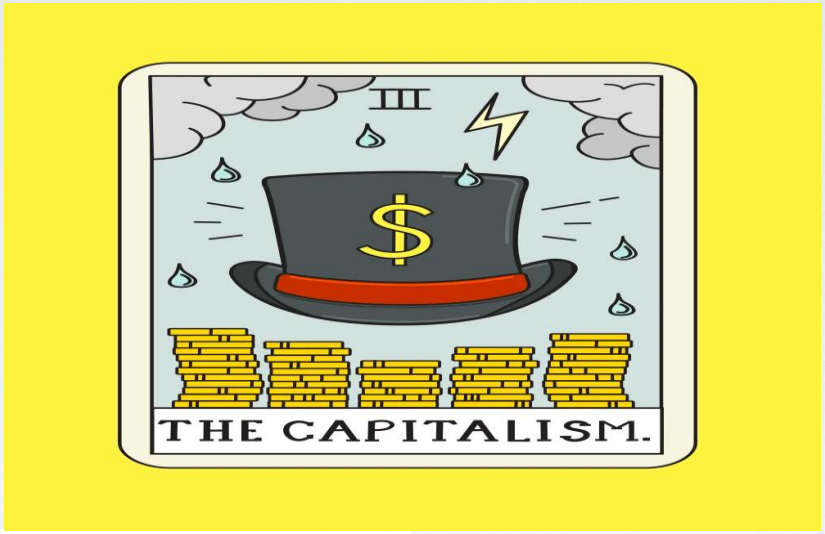
Rebuilding Foundations for Digital Economy

Qiang Tang

The University of Sydney

Digital Life Becomes Prevalent

Foundation of Economy



Shaky Foundations of Digital Economy

You are transparent to the platforms

The platforms are mysterious to you

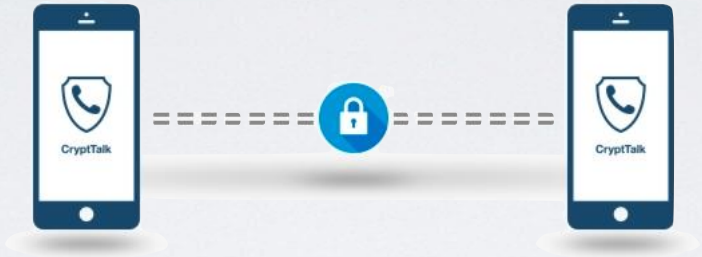
Act 1. Regaining Control of Your Data

Privacy:
Digital asset protection

Integrity:
Digital owner certificate

Controlling Data via Crypto

CLOUD STORAGE



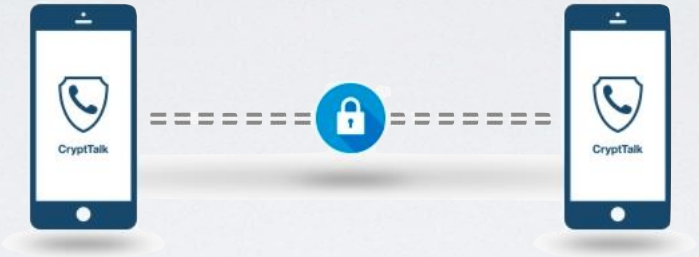
Our Related Results

Verifiable

Private

Usable

CLOUD STORAGE



Accountable

Verifiable

Private

Usable

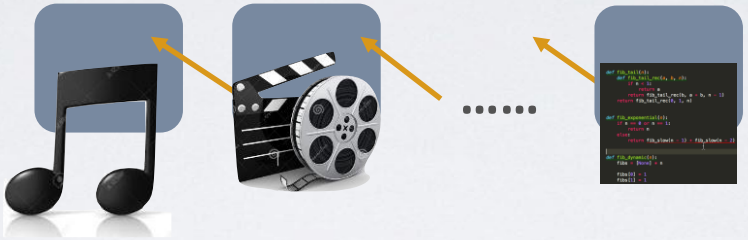
Control the data flow via specially designed crypto

Act 2. More Reliable and Economical Services

No single entity, enlarges accessibility

Transparency may even reduce cost

Tokenization



Crypto lets you claim ownership, via mathematics!

Blockchain lets you exchange, in a trustful & fine-grained way

Our Related Results

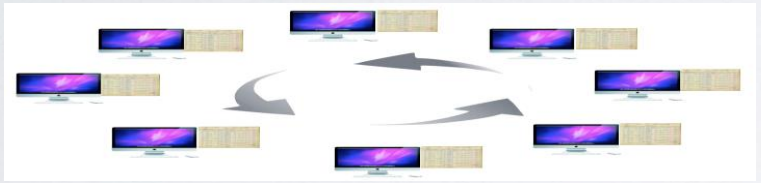
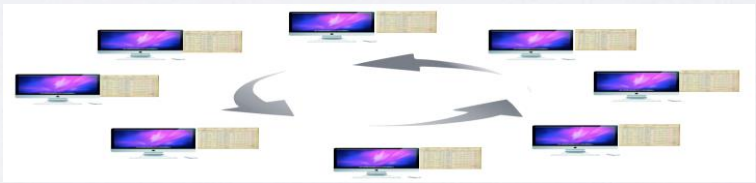




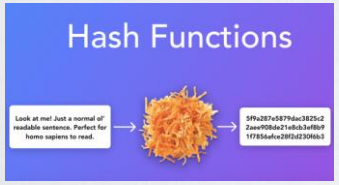


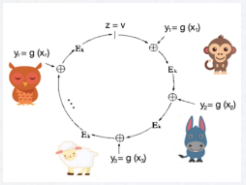
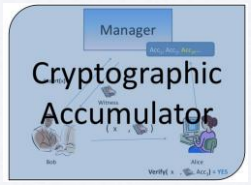
...

decentralized applications

consensus layer



...

cryptographic supports

Rebuild Foundations for Digital Economy

Rebuilding Foundations for Digital Economy

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qiang.tang@sydney.edu.au
http://alkistang.github.io/

NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Session #1
"Academic Overview of FinTech Research"

Q&A

NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Session # 2

Large Financial Institutions and Corporate FinTech Applications

Presented by:
The Martin Tuchman School of Management

MODERATOR

DAVID REEVE

Financial Advisor, Vice President
Merrill Lynch Wealth Management

LEIR RESEARCH INSTITUTE CONFERENCE 2021

KEYNOTE SPEAKER

JORDAN HU

CEO, RiskVal Financial Solutions, LLC

LEIR RESEARCH INSTITUTE CONFERENCE 2021

Large Financial Institutions & Corporate FinTech Applications

Jordan Hu
Chief Executive Officer
RiskVal Financial Solutions, LLC

RISKVAL
FINANCIAL SOLUTIONS

What is FinTech?

The term fintech is used to describe:

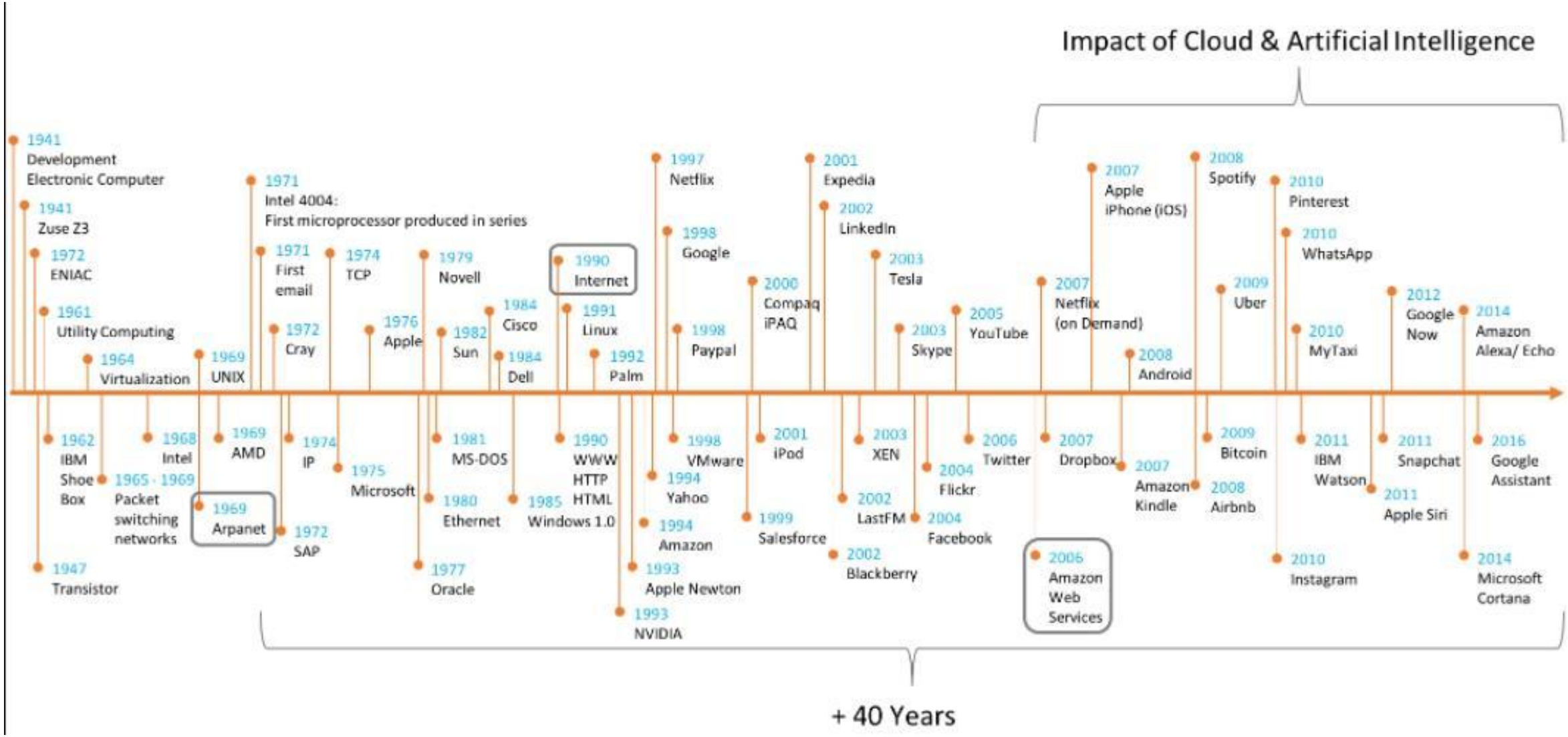
1. Innovative startup companies operating in the financial sector.

1. Application of modern technology solutions in the financial services industry.

1. Offering digitally enhanced products allowing widespread access to financial products at a lower cost than traditional players.

RISKVAL

FinTech is an evolution of digitization



We don’t know how it will end, but we know when it started

FinTech in 80’ Salomon Brother Trading Floor

Salomon Brothers ex-CEO John Gutfreund who was proclaimed the “King of Wall Street” in 1985 for harnessing the egos and fiefdoms of Salomon Brothers into one of the most profitable investment- banking firms

Core Technology:

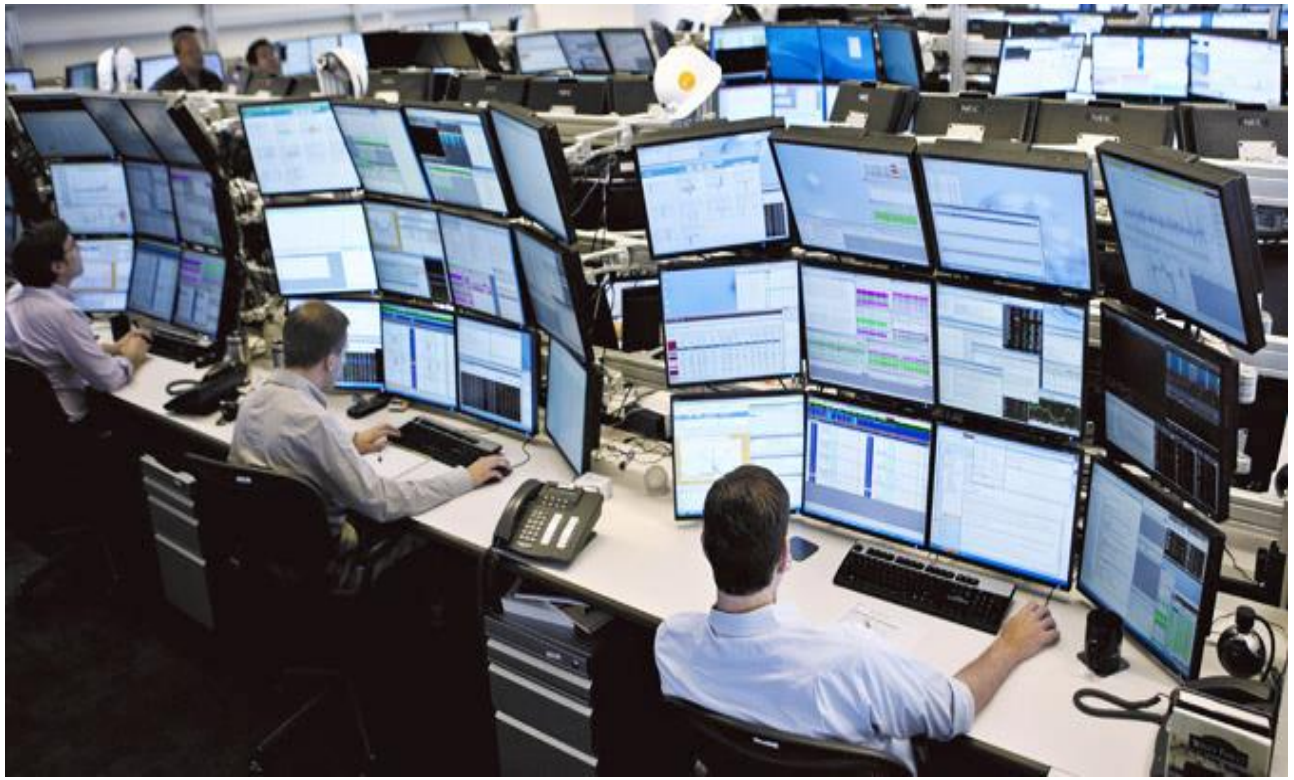
- Analog phones
- Analog trading screens
- Human carries most of Business Intelligent(BI)

FinTech in 90’ Salomon Brother Trading Floor

Core Technology:

- Internet (twister pair)
- PBX digital phones
- Desktop computers
- Digitized market data
- Desktop Trading Applications
- Human still carries most of Business Intelligent (BI)

FinTech Fast Forward Today - Typical Modern Trading Floor



Core Technology:

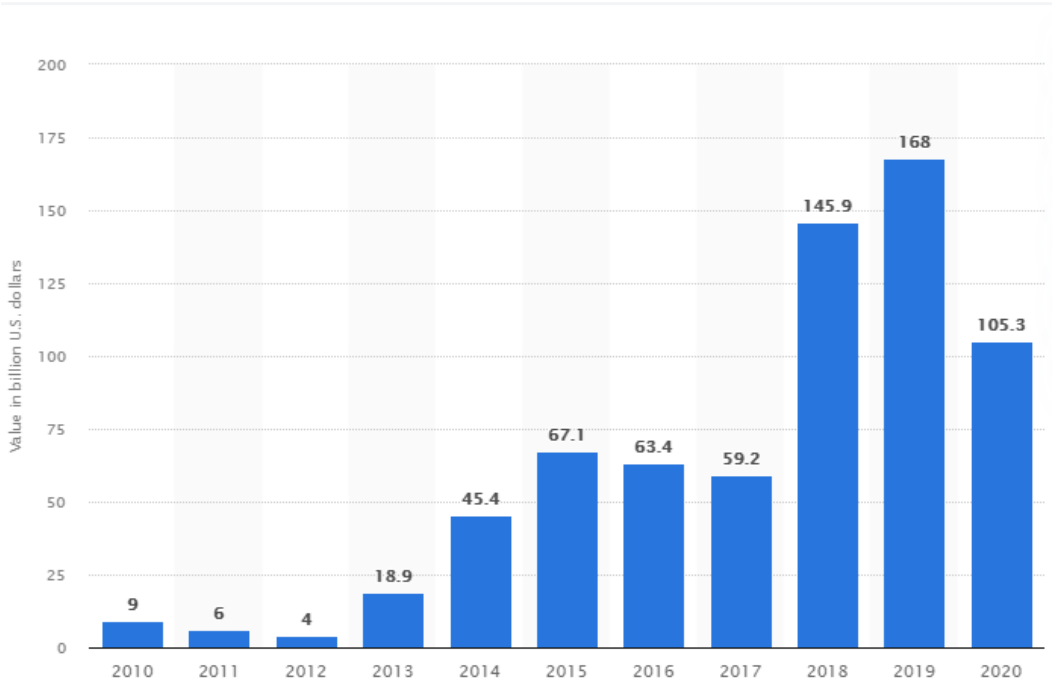
- High speed GB internet
- High computing power
- Desktop is disappearing
- Cloud based Applications
- BI moves to Applications
- Trading Automation
- Less dependency on Human
- Technology plays a critical role in modern trading floor

FinTech Front / Middle / Back Office Solutions

FinTech Big Picture:

- Banks and Institutions are investing $billions in each key function.
- FinTech innovations are driving the industry
- FinTech applications create many start-ups
- Data Science is the new domain in FinTech

Total Investment in FinTech (2010 ~ 2020)



- USA is a home to 10,605 FinTech Startups as of February 2021
- Majority of FinTech focus on money transfer & payment services
- Fastest growing FinTech segments: Insurance sector with consumer adoption rate growing at 40%
- Commercial banks are the 1st target for FinTech

How about Investment Bank?

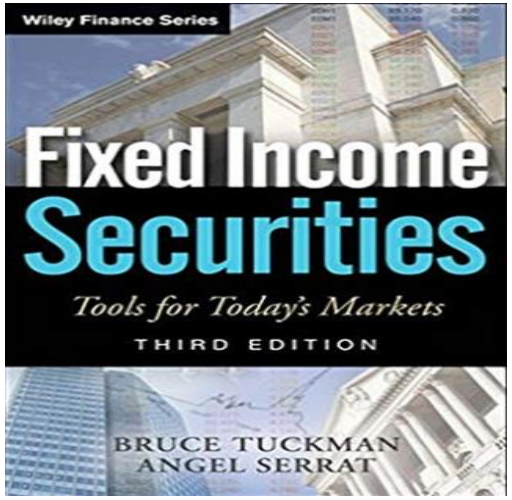
2020 was a very challenging year for most industries, but FinTech seems to have weathered the storm and continues the grow

RISKVAL

Long-Term Capital Market (LTCM)

- **Founded in 1994 by John Meriwether**
- **2 Nobel Prize economists:**
  - Dr. Myron Scholes
  - Dr. Robert Merton
- **16 Partners:**
  - Bill Krasker MIT Ph.D.
  - Larry Hillenbrand. MIT Ph.D.
  - Greg Hawkins MIT Ph.D.
  - Eric Rosenfeld MIT Ph.D.
- **1994 -** return 21% after fees
- **1995 -** return 43%
- **1996 -** return 41%
- **1997 -** Asia financial crisis
- **1998 -** Russian financial crisis
- **September 23, 1998 –** dissolution
- **July 31, 1998 -** I lost my job at Salomon Brothers

My Mentor & Friend Dr. Bruce Tuckman



Education

- **MIT Ph.D.** in Economics

Experience:

- **CFTC** Chief Economist
- **Barclays:**
  - Fixed Income Global Head of FX and Rates
- **Lehman Brothers**
  - Fixed Income Prop Trading
- **Credit Suisse**
  - Fixed Income Prop Trading
- **Salomon Brothers**
  - Fixed Income Research
  - Salomon Brothers Arbitrage Trading

2+ Term Structure model

The term structure is defined by 2 random factors and one deterministic factor. The factor x is a risk neutral process for the long-term rate process. The factor y is the risk neutral process of a short term spread factor such that the equilibrium instantaneous rate is x+y. The factor z is the risk neutral process for the actual instantaneous rate. The stochastic evolution of x, y, and z are governed by the following equations:

$$dx = \mu dt + \sigma_x d\omega_x$$

$$dy = -\alpha y dt + \sigma_y d\omega_y$$

$$dz = k(x + y - z)dt$$

2+ Term Structure model -- cont.

$$x(t) = x_0 + \mu(t) + \sigma_x \omega_x(t)$$

$$y(t) = e^{-\alpha t} x_0 + \sigma_y e^{-\alpha t} \int_0^t e^{\alpha s}\, d\omega_y(s)$$

$$z(t) = z_0 e^{-kt} + x_0\left(1 - e^{-kt}\right) + y_0 \frac{k\left(e^{-\alpha t} - e^{-kt}\right)}{k - a} + \mu\left(t - \frac{1 - e^{-kt}}{k}\right) + \sigma_x \omega_x(t)$$

$$-\sigma_x e^{-kt} \int_0^t e^{ks}\, d\omega_x(s) + \frac{k\sigma_y}{k-\alpha} e^{-\alpha t} \int_0^t e^{\alpha s} d\omega_y(s) - \frac{k\sigma_y}{k-\alpha} e^{-kt} \int_0^t e^{ks} d\omega_y(s)$$

$$P(T) = E\left[e^{-\int_0^T z(s)\, ds}\right]$$

$$\begin{aligned} P(T) = \exp[& -x_0\left(T - \frac{1 - e^{-kT}}{k}\right) - \frac{k y_0}{k - \alpha}\left(\frac{1 - e^{-\alpha T}}{\alpha} - \frac{1 - e^{-kT}}{k}\right) - z_0 \frac{1 - e^{-kT}}{k} \\ & + \mu\left[\frac{1}{k}\left(T - \frac{1 - e^{-kT}}{k}\right) - \frac{T^2}{2}\right] + \frac{\sigma_x^2 T^3}{6} - \frac{T}{2}\left(\frac{\sigma_x^2}{k^2} - \frac{\sigma_y^2}{\alpha^2}\right) - \frac{\sigma_x^2}{2k}\left(T - \frac{1 - e^{-kT}}{k}\right)^2 \\ & - \frac{\rho_y^2 k^2}{4\alpha^3 (k - \alpha)^2}\left(e^{-\alpha T} - 1\right)\left(e^{-\alpha T} - 3\right) + \frac{1}{4k}\left(\frac{\sigma_x^2}{k^2} - \frac{\sigma_y^2}{(k - \alpha)^2}\right)\left(e^{-kT} - 1\right)\left(e^{-kT} - 3\right) \\ & + \frac{\sigma_y^2 k}{\alpha(\alpha + k)(k - \alpha)^2}\left(1 - e^{-\alpha T}\right)\left(1 - e^{-kT}\right) + \frac{\sigma_y^2 k^2}{\alpha^2(\alpha + k)(k - \alpha)^2}\left(1 - e^{-\alpha T}\right) \\ & + \frac{\sigma_y^2}{(\alpha + k)(k - \alpha)^2}\left(1 - e^{-kT}\right)] \end{aligned}$$

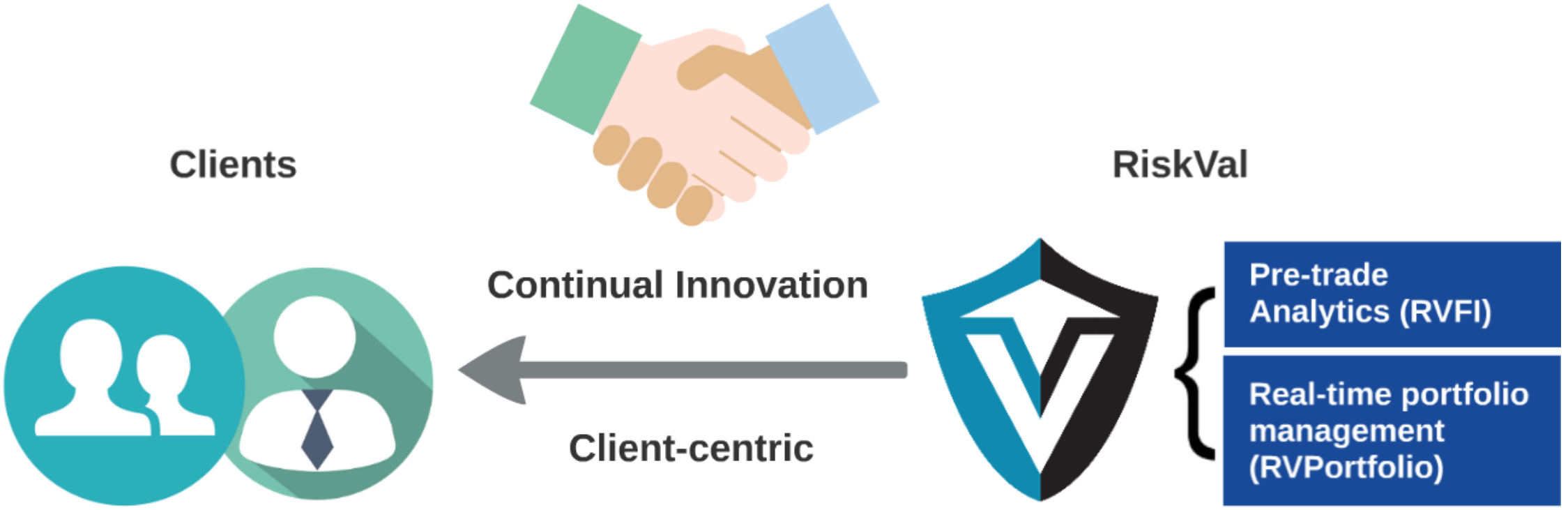
2+ Term Structure model -- cont.

- Interest rate distribution: Normal or Lognormal
- Salomon IRMA() mixed distribution

$$P(T) = E[e^{-\int_0^T IRMA(z(s))ds}]$$

- Monti Carlo simulation
- Random numbers are not random enough

RiskVal at a Glance



20 Years of RiskVal

2001: Founded by current CEO Jordan Hu

2003: RiskVal Fixed-Income (RVFI) becomes available

2005: RVCredit is developed

2009: First Media Attention
- Finextra Innovation Showcase of 2009
- Waters Rankings awards

2009: Asia office opened
Taipei, Taiwan

2010: Portolio management system (RVPortfolio) is developed

2015: Recognition
- Custody Risk's "Risk Technology Vendor of the Year"
- Waters Technology's "Best Sell-Side Market Risk Product"

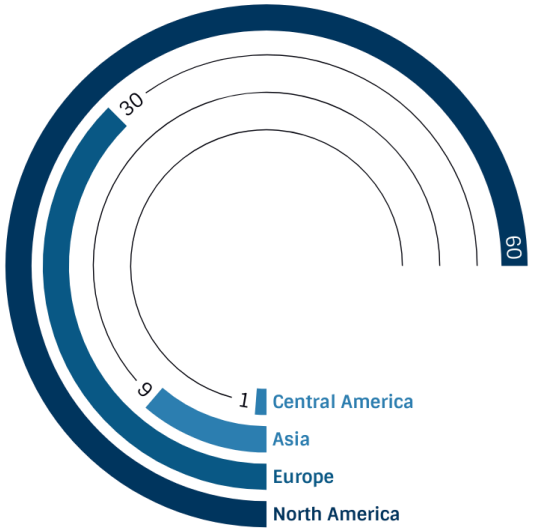
2016: Recognition
Waters Technology's "Best Market Risk Solution Provider" and "Best Portfolio Management System Provider"

2017: Recognition
Waters Technology's "Best Market Risk Solution Provider" and "Best Portfolio Management System Provider" for 2nd year

2018: 2nd US office opened
Princeton, NJ

2018: Recognition
- Best Sell-Side Market Risk Product
- Waters Sell-Side Technology's "Best Sell-Side Market Risk Product"
- Chartis Research's "Category Leader"

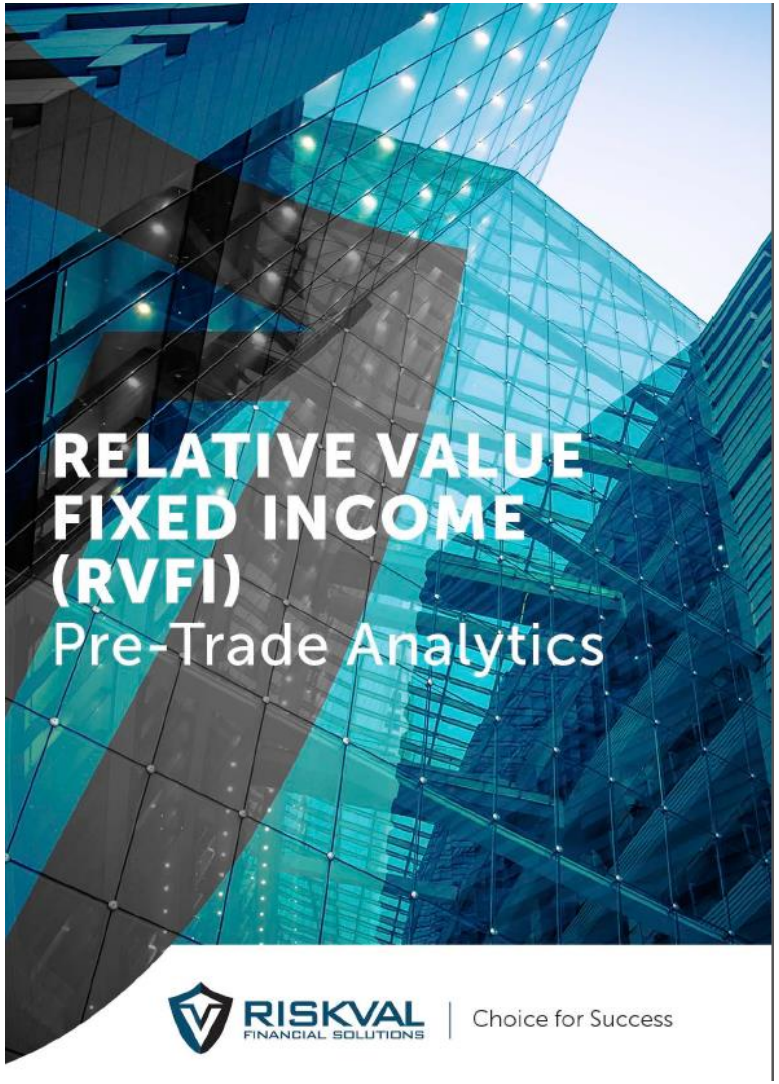
Our Clients



Buy-Side

Sample Client List

Pre-Trade Analytics



RISKVAL

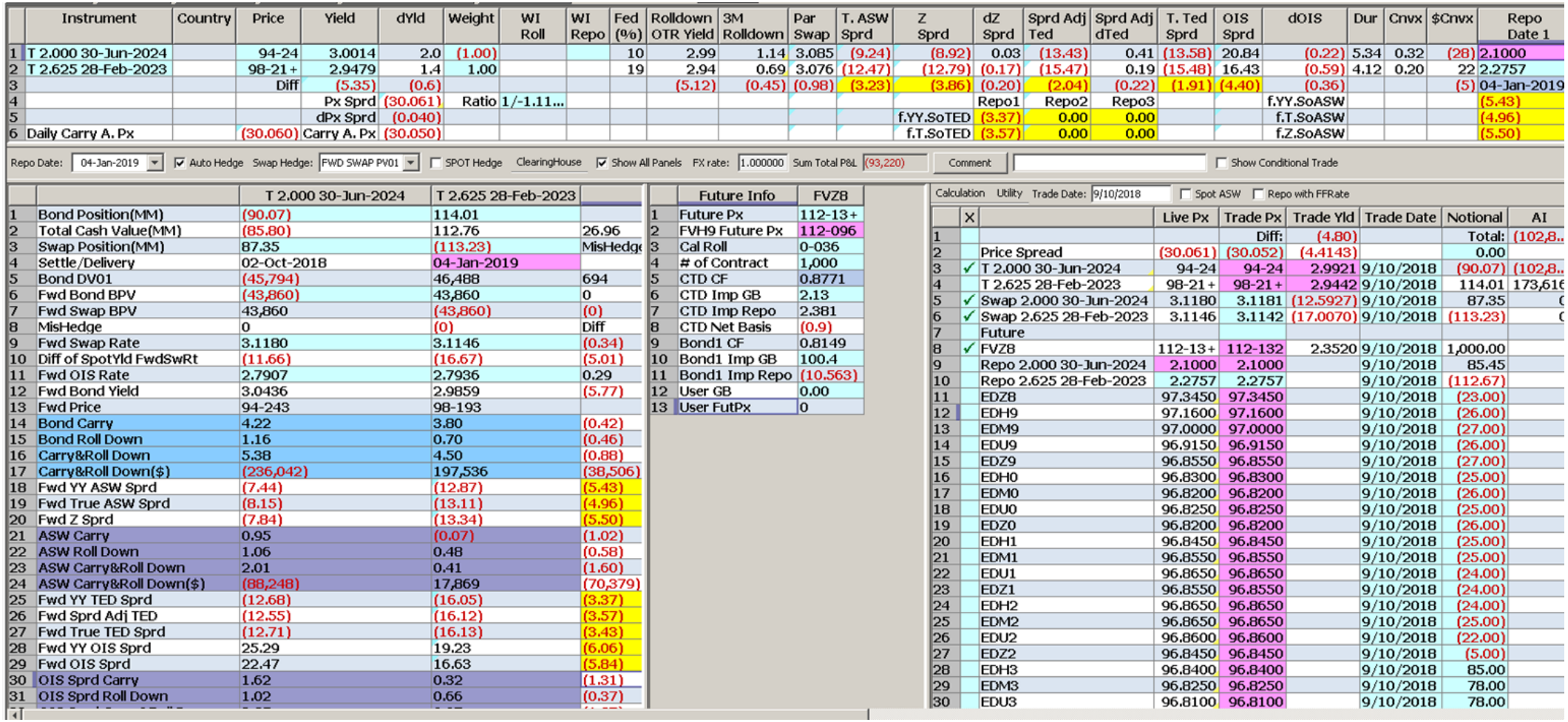
Relative Value Arbitrage Trading

How to identify good strategies?

	Sprd/BFly	Sprd	dSprd	dSprd /stdev	Yld Chart	3M Yld Rich<->Chp	Yld Z-Score	Gross(-1/2/-1) BFly Weight	Mean	Stdev (dChg)	3M (C+R)	CT5 Corr	CT5 Beta	CT5 Equiv	2/10 Corr	2/10 Residual	RSI(14) Sprd	OverBought<->OverSold Sprd
7	2/10/30	10.89	1.2	0.82			(0.11)	-1/2/-1	11.33	1.40	(5.25)	0.77	0.40	1.82	0.88	(10.0)	54.7	
8	2/10	26.14	2.4	1.52			0.20	-1/1	25.44	1.55	(6.66)	0.56	0.32	1.82	1.00	(0.0)	56.2	
9	2/30	41.40	3.6	1.80			0.52	-1/1	39.56	1.98	(8.06)	0.33	0.24	4.02	0.94	10.0	56.3	
10	5/10	12.08	1.3	1.84			0.73	-1/1	11.17	0.71	(1.75)	0.02	0.00	1.82	0.79	2.7	56.6	
11	5/30	27.34	2.5	1.84			0.72	-1/1	25.28	1.36	(3.15)	(0.14)	(0.07)	4.02	0.64	12.6	56.2	
12	7/10	4.77	0.9	2.64			1.09	-1/1	3.84	0.35	(1.00)	(0.30)	(0.04)	1.82	0.49	1.9	58.0	
13	10/30	15.26	1.2	1.63			0.64	-1/1	14.12	0.74	(1.41)	(0.28)	(0.08)	4.02	0.43	10.0	55.1	
14	== FLY																	
15	2/3/5	(1.05)	(1.0)	(1.70)			(1.45)	-1/2/-1	0.82	0.59	(0.92)	0.09	0.02	0.61	(0.03)	(0.7)	35.0	
16	3/5/7	0.25	0.6	1.31			0.51	-1/2/-1	(0.60)	0.49	(1.25)	0.59	0.11	1.00	0.23	(1.7)	61.3	
17	2/5/10	1.99	(0.3)	(0.26)			(0.34)	-1/2/-1	3.11	0.97	(3.17)	0.87	0.31	1.00	0.44	(5.4)	49.6	
18	2/10/30	10.89	1.2	0.82			(0.11)	-1/2/-1	11.33	1.40	(5.25)	0.77	0.40	1.82	0.88	(10.0)	54.7	
19	2/FV1/5	10.52	(0.2)	0.14			(0.02)	-1/2/-1	10.56	1.17	(3.43)	0.77	0.33	0.89	0.82	(5.8)	52.4	
20	5/TY1/10	1.60	(0.6)	(0.33)			(1.14)	-1/2/-1	3.03	0.53	0.64	0.49	0.10	1.32	0.45	(2.4)	43.9	
21	10/US1/30	(4.59)	0.4	0.81			1.98	-1/2/-1	(6.87)	0.50	0.42	0.37	0.07	3.21	0.51	(8.8)	66.8	
22	10/WN1/30	14.91	1.0	1.31			1.02	-1/2/-1	13.21	0.76	(0.77)	(0.23)	(0.06)	3.90	0.42	9.5	56.7	
23	== BASIS																	
24	TU1/2	(0.31)	(0.4)	(1.53)			0.38	-1/1	(0.45)	0.28	0.03	0.04	0.00	0.42	(0.15)	0.4	48.0	
25	FV1/5	1.77	0.6	2.84			(0.14)	-1/1	1.86	0.22	(0.74)	(0.11)	(0.01)	1.00	0.06	1.5	54.9	
26	TY1/7	0.47	0.0	(1.02)			0.86	-1/1	0.22	0.18	(0.19)	(0.12)	(0.01)	1.36	(0.05)	0.6	53.3	
27	US1/30	9.92	0.4	0.99			(0.52)	-1/1	10.50	0.40	(0.91)	(0.49)	(0.07)	4.02	0.08	9.4	43.6	
28	WN1/30	0.17	0.1	1.71			(1.21)	-1/1	0.46	0.13	(0.32)	(0.13)	(0.01)	4.02	(0.02)	0.2	46.3	
29	== OFF-THE-RUN																	
30	0010/010/10	0.02	0.0	0.11			(2.12)	-1/2/-1	0.75	0.27	(0.22)	0.22	0.02	1.78	0.21	(1.0)	42.5	
31	0030/030/30	(0.44)	0.1	1.26			1.46	-1/2/-1	(0.56)	0.07	0.02	0.23	0.01	4.06	0.10	(0.6)	59.5	
32	4.625 240/4.25 N40	1.36	0.0	0.56			1.43	-1/1	1.23	0.07	(0.06)	(0.39)	(0.01)	3.77	(0.17)	1.6	56.6	
33	1.5 122/1.875 222	0.46	0.3	1.30			0.60	-1/1	0.29	0.22	(0.03)	(0.15)	(0.01)	0.69	(0.31)	1.8	51.9	
34	6.75 826/6.375 827	3.64	0.4	1.61			1.12	-1/1	3.13	0.23	(0.31)	0.01	0.00	1.92	0.42	2.0	55.4	
35	1.5 826/2.25 227/6.375 827	2.86	0.2	0.79			1.17	-1/2/-1	2.37	0.25	(0.18)	(0.13)	(0.01)	1.54	0.01	2.8	65.0	

Relative Value Arbitrage Trading -cont

How to monetize good strategies?



	Instrument	Country	Price	Yield	dYld	Weight	WI Roll	WI Repo	Fed (%)	Rolldown OTR Yield	3M Rolldown	Par Swap	T. ASW Sprd	Z Sprd	dZ Sprd	Sprd Adj Ted	Sprd Adj dTed	T. Ted Sprd	OIS Sprd	dOIS	Dur	Cnvx	$Cnvx	Repo Date 1
1	T 2.000 30-Jun-2024		94-24	3.0014	2.0	(1.00)			10	2.99	1.14	3.085	(9.24)	(8.92)	0.03	(13.43)	0.41	(13.58)	20.84	(0.22)	5.34	0.32	(28)	2.1000
2	T 2.625 28-Feb-2023		98-21+	2.9479	1.4	1.00			19	2.94	0.69	3.076	(12.47)	(12.79)	(0.17)	(15.47)	0.19	(15.48)	16.43	(0.59)	4.12	0.20	22	2.2757
3			Diff	(5.35)	(0.6)					(5.12)	(0.45)	(0.98)	(3.23)	(3.86)	(0.20)	(2.04)	(0.22)	(1.91)	(4.40)	(0.36)			(5)	04-Jan-2019
4				Px Sprd	(30.061)	Ratio	1/-1.11...								Repo1	Repo2	Repo3			f.YY.SoASW				(5.43)
5				dPx Sprd	(0.040)									f.YY.SoTED	(3.37)	0.00	0.00			f.T.SoASW				(4.96)
6	Daily Carry A. Px		(30.060)	Carry A. Px	(30.050)									f.T.SoTED	(3.57)	0.00	0.00			f.Z.SoASW				(5.50)

Repo Date: 04-Jan-2019 | Auto Hedge | Swap Hedge: FWD SWAP PV01 | SPOT Hedge | ClearingHouse | Show All Panels | FX rate: 1.000000 | Sum Total P&L (93,220) | Comment | Show Conditional Trade

		T 2.000 30-Jun-2024	T 2.625 28-Feb-2023	
1	Bond Position(MM)	(90.07)	114.01	
2	Total Cash Value(MM)	(85.80)	112.76	26.96
3	Swap Position(MM)	87.35	(113.23)	MisHedge
4	Settle/Delivery	02-Oct-2018	04-Jan-2019	
5	Bond DV01	(45,794)	46,488	694
6	Fwd Bond BPV	(43,860)	43,860	0
7	Fwd Swap BPV	43,860	(43,860)	(0)
8	MisHedge	0	(0)	Diff
9	Fwd Swap Rate	3.1180	3.1146	(0.34)
10	Diff of SpotYld FwdSwRt	(11.66)	(16.67)	(5.01)
11	Fwd OIS Rate	2.7907	2.7936	0.29
12	Fwd Bond Yield	3.0436	2.9859	(5.77)
13	Fwd Price	94-243	98-193	
14	Bond Carry	4.22	3.80	(0.42)
15	Bond Roll Down	1.16	0.70	(0.46)
16	Carry&Roll Down	5.38	4.50	(0.88)
17	Carry&Roll Down($)	(236,042)	197,536	(38,506)
18	Fwd YY ASW Sprd	(7.44)	(12.87)	(5.43)
19	Fwd True ASW Sprd	(8.15)	(13.11)	(4.96)
20	Fwd Z Sprd	(7.84)	(13.34)	(5.50)
21	ASW Carry	0.95	(0.07)	(1.02)
22	ASW Roll Down	1.06	0.48	(0.58)
23	ASW Carry&Roll Down	2.01	0.41	(1.60)
24	ASW Carry&Roll Down($)	(88,248)	17,869	(70,379)
25	Fwd YY TED Sprd	(12.68)	(16.05)	(3.37)
26	Fwd Sprd Adj TED	(12.55)	(16.12)	(3.57)
27	Fwd True TED Sprd	(12.71)	(16.13)	(3.43)
28	Fwd YY OIS Sprd	25.29	19.23	(6.06)
29	Fwd OIS Sprd	22.47	16.63	(5.84)
30	OIS Sprd Carry	1.62	0.32	(1.31)
31	OIS Sprd Roll Down	1.02	0.66	(0.37)

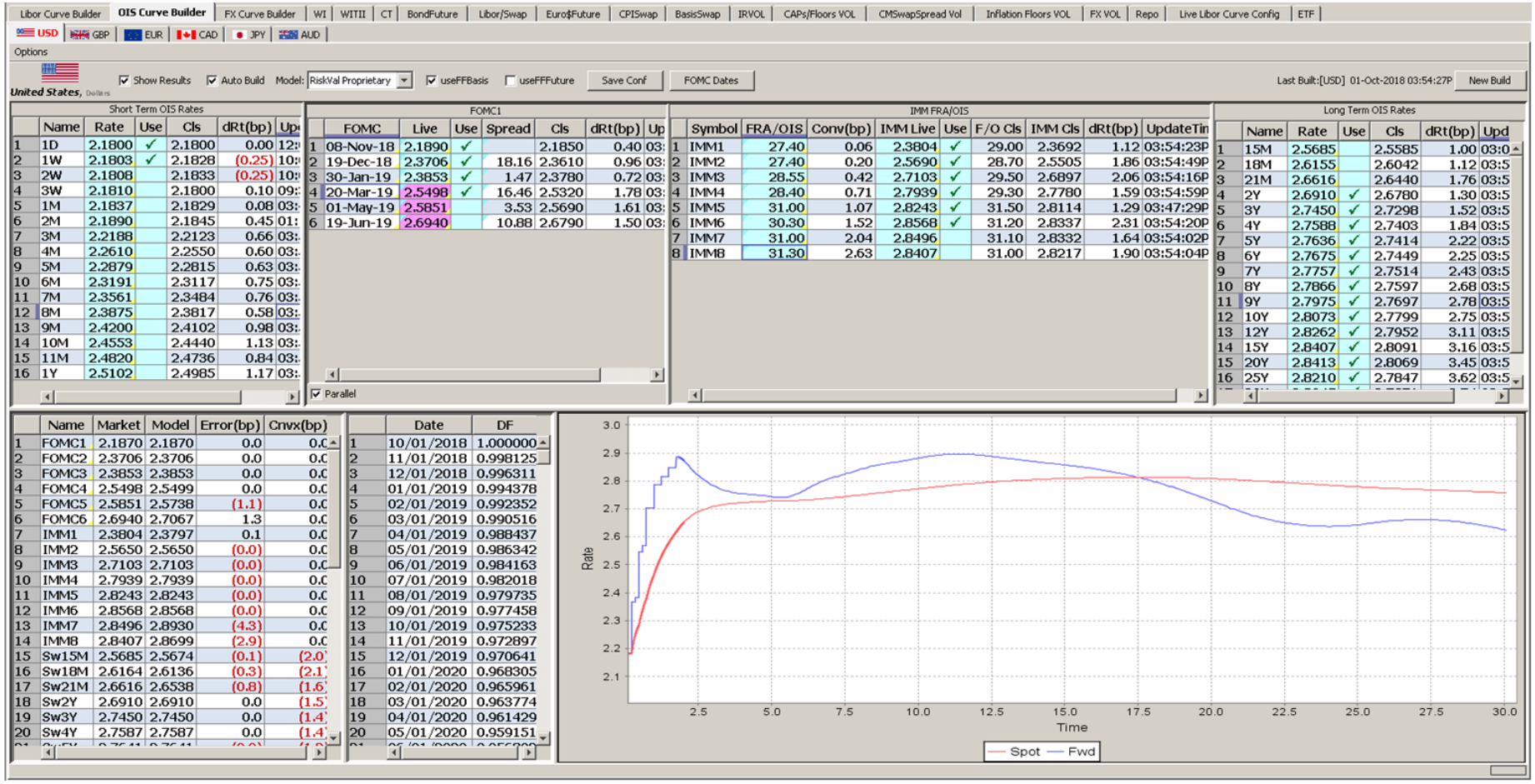
	Future Info	FVZ8
1	Future Px	112-13+
2	FVH9 Future Px	112-096
3	Cal Roll	0-036
4	# of Contract	1,000
5	CTD CF	0.8771
6	CTD Imp GB	2.13
7	CTD Imp Repo	2.381
8	CTD Net Basis	(0.9)
9	Bond1 CF	0.8149
10	Bond1 Imp GB	100.4
11	Bond1 Imp Repo	(10.563)
12	User GB	0.00
13	User FutPx	0

Calculation | Utility | Trade Date: 9/10/2018 | Spot ASW | Repo with FFRate

	X		Live Px	Trade Px	Trade Yld	Trade Date	Notional	AI
1				Diff:	(4.80)		Total:	(102,8..
2		Price Spread	(30.061)	(30.052)	(4.4143)		0.00	
3	✓	T 2.000 30-Jun-2024	94-24	94-24	2.9921	9/10/2018	(90.07)	(102,8..
4		T 2.625 28-Feb-2023	98-21+	98-21+	2.9442	9/10/2018	114.01	173,616
5	✓	Swap 2.000 30-Jun-2024	3.1180	3.1181	(12.5927)	9/10/2018	87.35	
6	✓	Swap 2.625 28-Feb-2023	3.1146	3.1142	(17.0070)	9/10/2018	(113.23)	
7		Future						
8	✓	FVZ8	112-13+	112-132	2.3520	9/10/2018	1,000.00	
9		Repo 2.000 30-Jun-2024	2.1000	2.1000		9/10/2018	85.45	
10		Repo 2.625 28-Feb-2023	2.2757	2.2757		9/10/2018	(112.67)	
11		EDZ8	97.3450	97.3450		9/10/2018	(23.00)	
12		EDH9	97.1600	97.1600		9/10/2018	(26.00)	
13		EDM9	97.0000	97.0000		9/10/2018	(27.00)	
14		EDU9	96.9150	96.9150		9/10/2018	(26.00)	
15		EDZ9	96.8550	96.8550		9/10/2018	(27.00)	
16		EDH0	96.8300	96.8300		9/10/2018	(25.00)	
17		EDM0	96.8200	96.8200		9/10/2018	(26.00)	
18		EDU0	96.8250	96.8250		9/10/2018	(25.00)	
19		EDZ0	96.8200	96.8200		9/10/2018	(26.00)	
20		EDH1	96.8450	96.8450		9/10/2018	(25.00)	
21		EDM1	96.8550	96.8550		9/10/2018	(25.00)	
22		EDU1	96.8650	96.8650		9/10/2018	(24.00)	
23		EDZ1	96.8550	96.8550		9/10/2018	(24.00)	
24		EDH2	96.8650	96.8650		9/10/2018	(24.00)	
25		EDM2	96.8650	96.8650		9/10/2018	(25.00)	
26		EDU2	96.8600	96.8600		9/10/2018	(22.00)	
27		EDZ2	96.8450	96.8450		9/10/2018	(5.00)	
28		EDH3	96.8400	96.8400		9/10/2018	85.00	
29		EDM3	96.8250	96.8250		9/10/2018	78.00	
30		EDU3	96.8100	96.8100		9/10/2018	78.00	

Relative Value Arbitrage Trading - cont

Since 2008, the market has switch away from Libor discounting



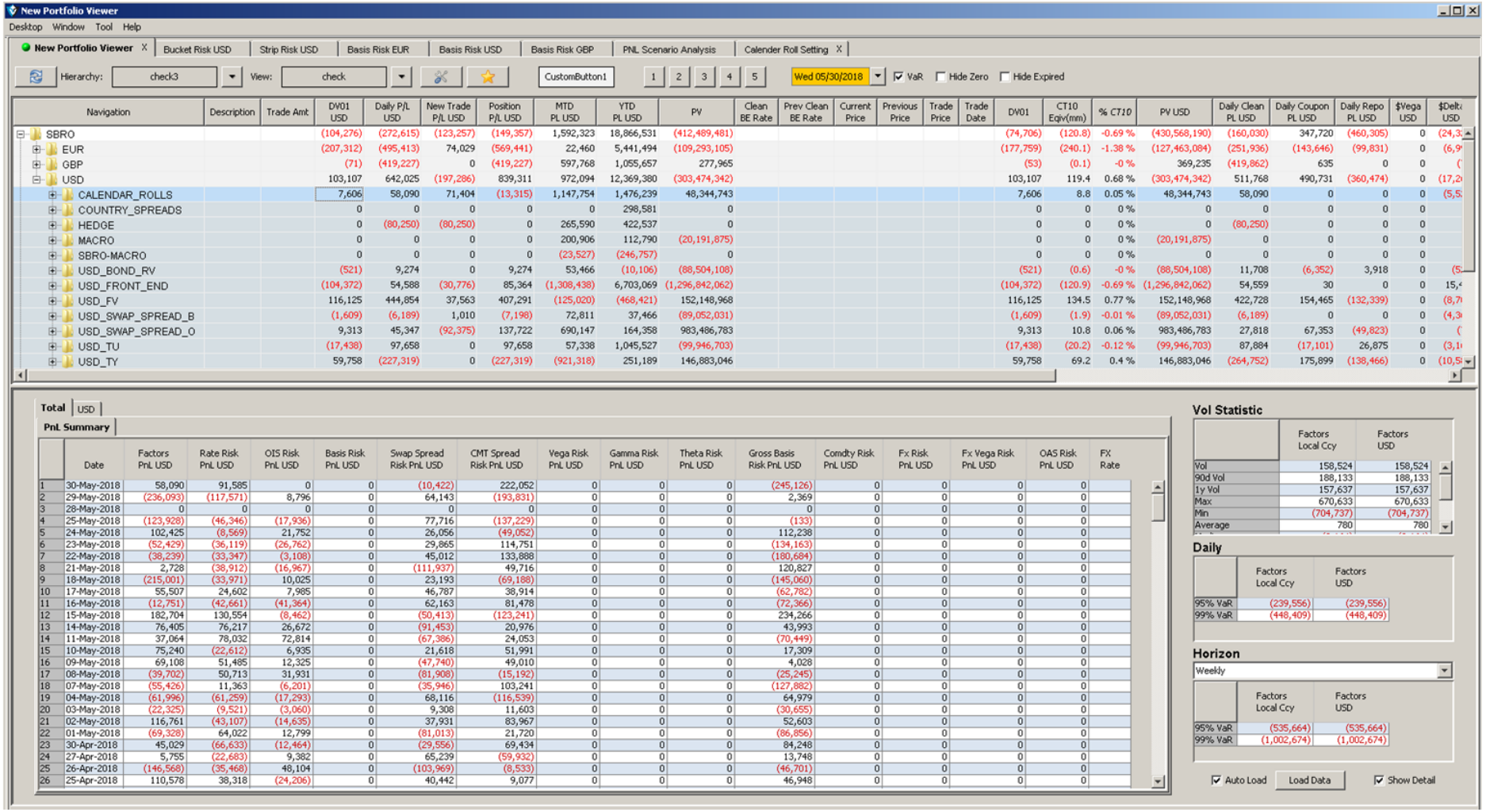
Real Time Portfolio Risk Management

What constructs a good portfolio system?

- Book/Record Management
- Trade Life Cycle Management
- Real Time Market Data
- Risk Analytics
- VaR that makes sense
- P/L attributions
- Risk allocation and control
- Enhance Alpha

RISKVAL

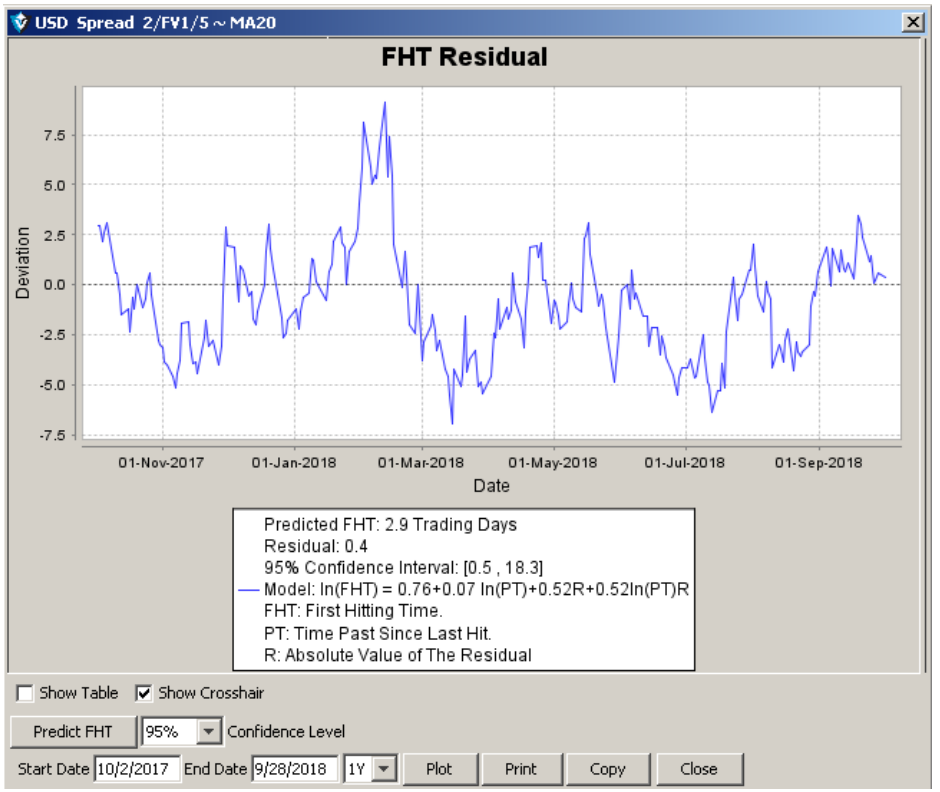
RVPortfolio



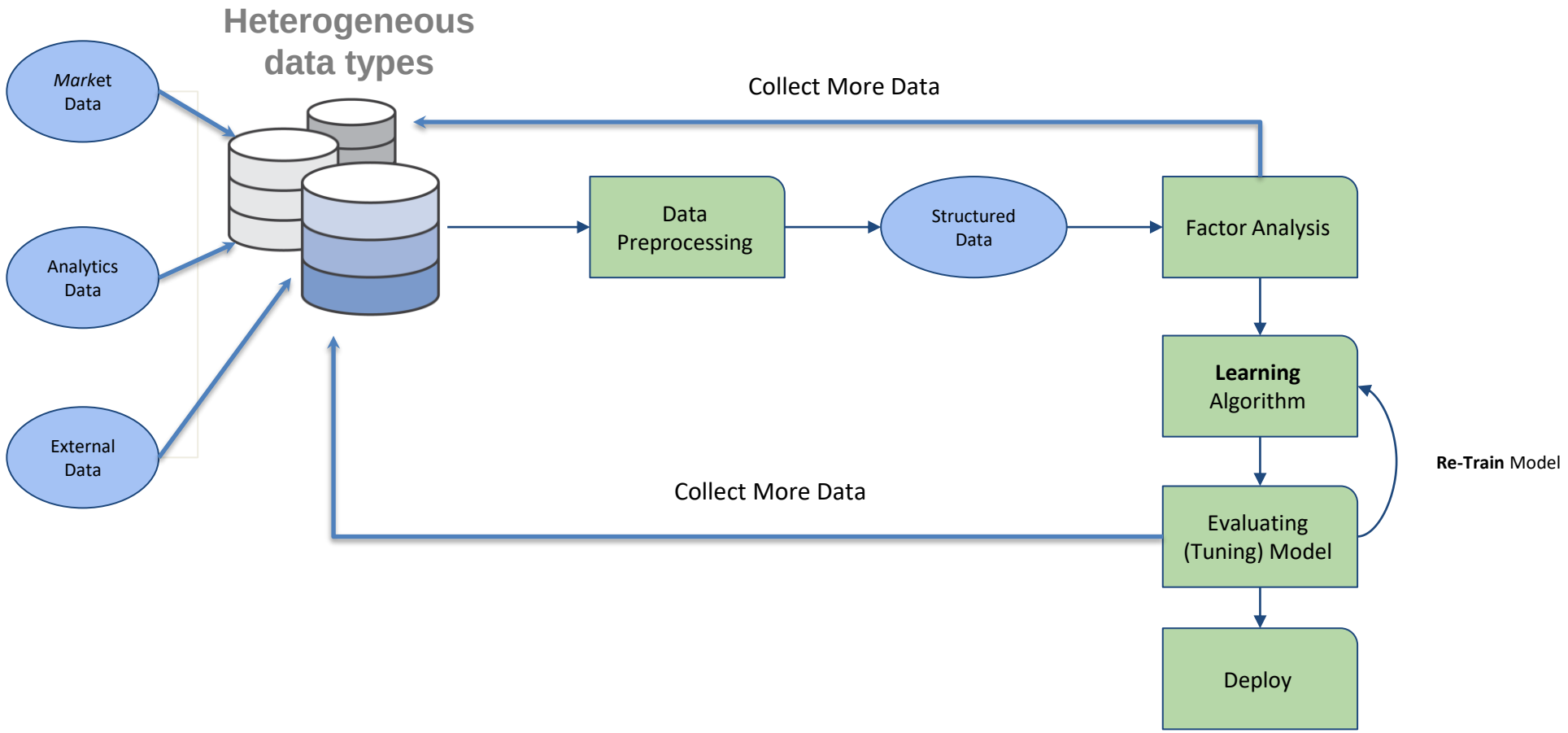
Data Science

How can data science help in trading?

Game Theory?



RiskVal's Software 2.0



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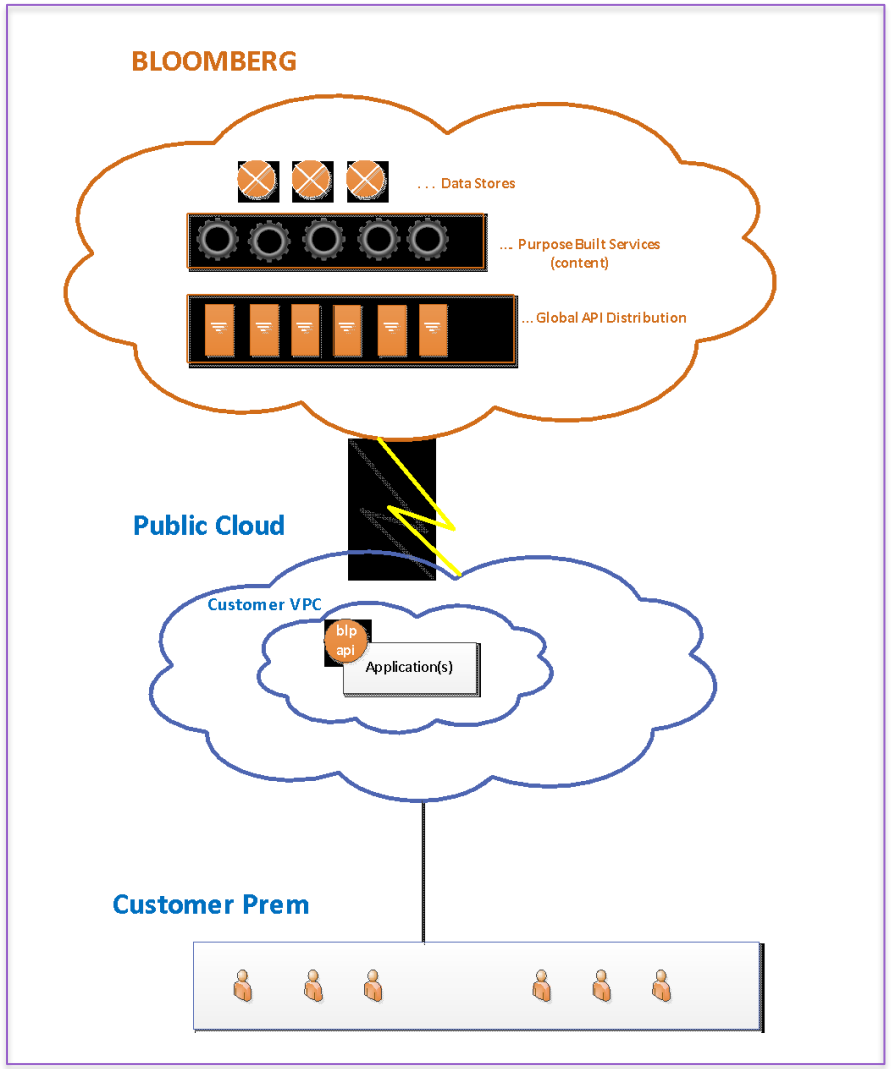
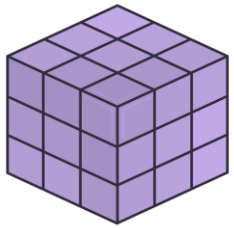


- Customer applications connect, via the internet, to Bloomberg hosted B-PIPEs. No deployed market data infrastructure.
- Technology is resilient, managed, monitored, and accessible via the same API as deployed solutions.
- More than 30 customers in production globally.
- Becoming the preferred choice for development environments.
- Available content includes market data, reference data, history, discovery services, and MSG1 scraping.
- Subscription, Publishing (contributions to Bloomberg) and request/response paradigms are supported.
- Purpose-built services and News coming later this year.
- Support for dedicated connectivity and local ticker plant distribution coming in early 2019.

What Capital Markets Firms are asking of AWS

Digital channels

Grid/high-performance computing

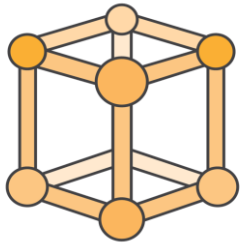


Agile data analytics

Core systems transformation

AI/Machine Learning

Blockchain and DLT



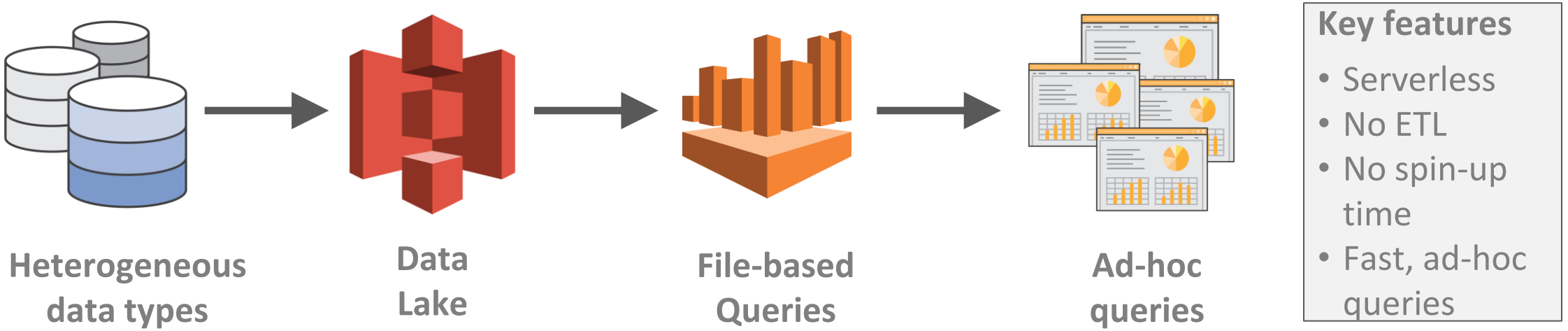
Widespread adoption today

Gaining traction

YOU ARE HERE

Agile Analytics in the Cloud

Cloud-based data lakes and interactive querying services are enabling financial institutions to run analytics more quickly and easily, without building and maintaining data warehouses.

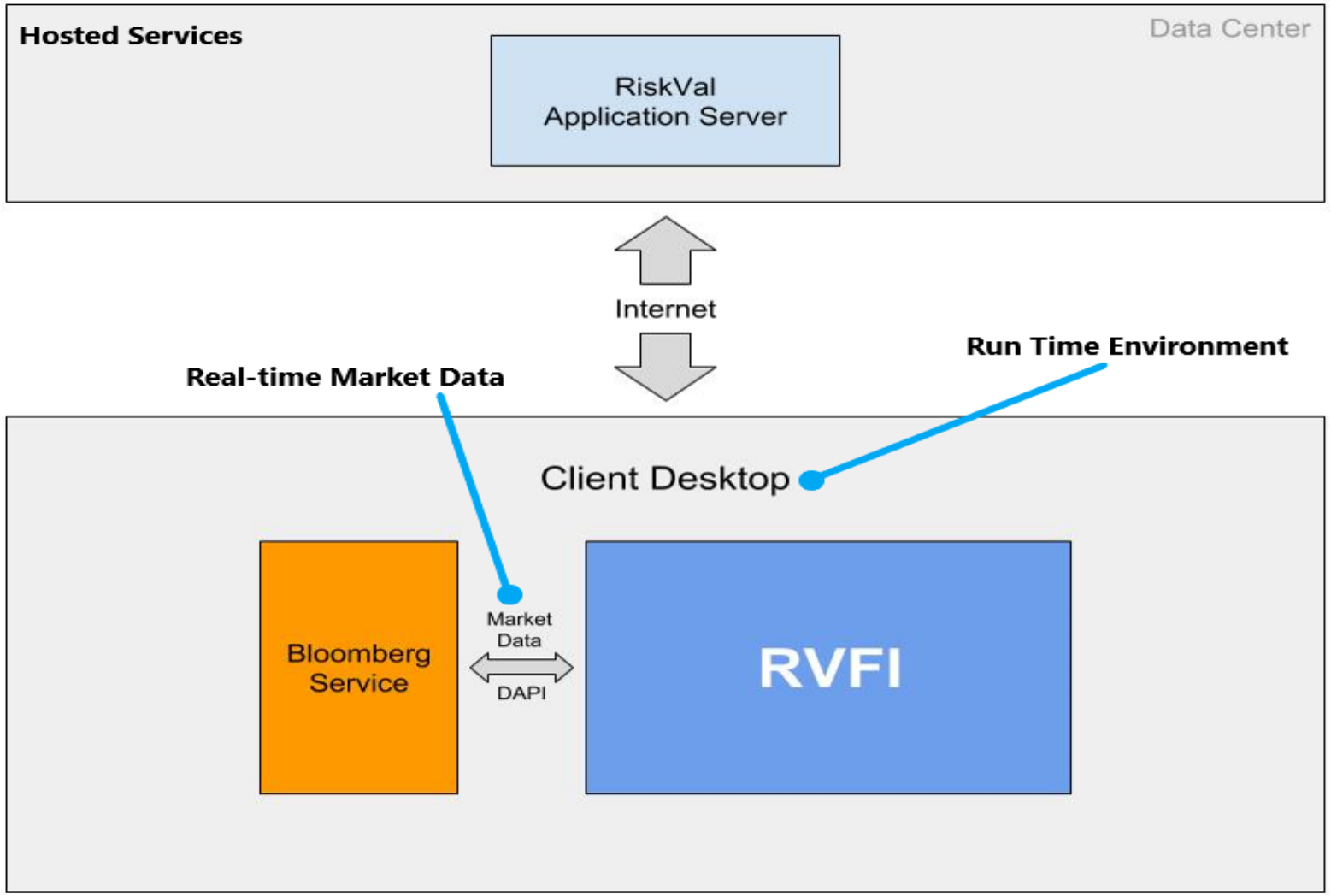


What Financial Market Utilities are asking

"Cloud computing has reached the tipping point as the capabilities, resiliency and security of services provided by cloud vendors now exceed those of many on-premises data centers."

— DTCC, *Moving Financial Market Infrastructure to the Cloud*

RiskVal On RT Cloud: Current Architecture



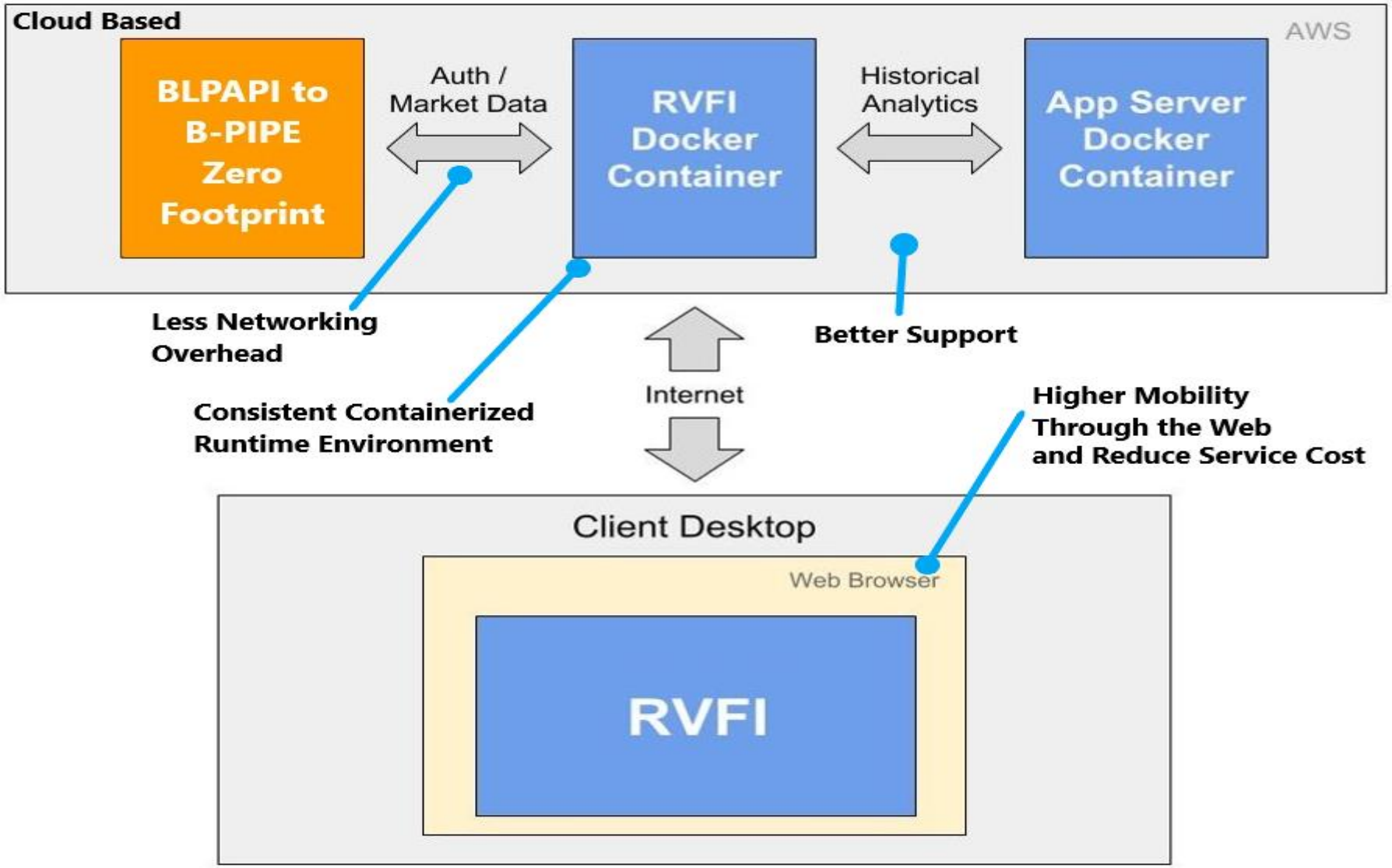
The Next Generation of Financial Software Services

- **Virtualization of Market Data**
  - Reduce MD integration complexity
  - Simplify design/implementation architecture

- **Virtualization of Software as a Service**
  - Avoid competition on system resource on client's PC.
  - Dynamic and Scalable run time environment
  - True and easy to maintain DR environment

- **Virtualization of Service Support**
  - More efficient in problem solving in service or market data issues
  - More efficient in service update and maintenance.

RiskVal On RT Cloud: New Architecture



RISKVAL

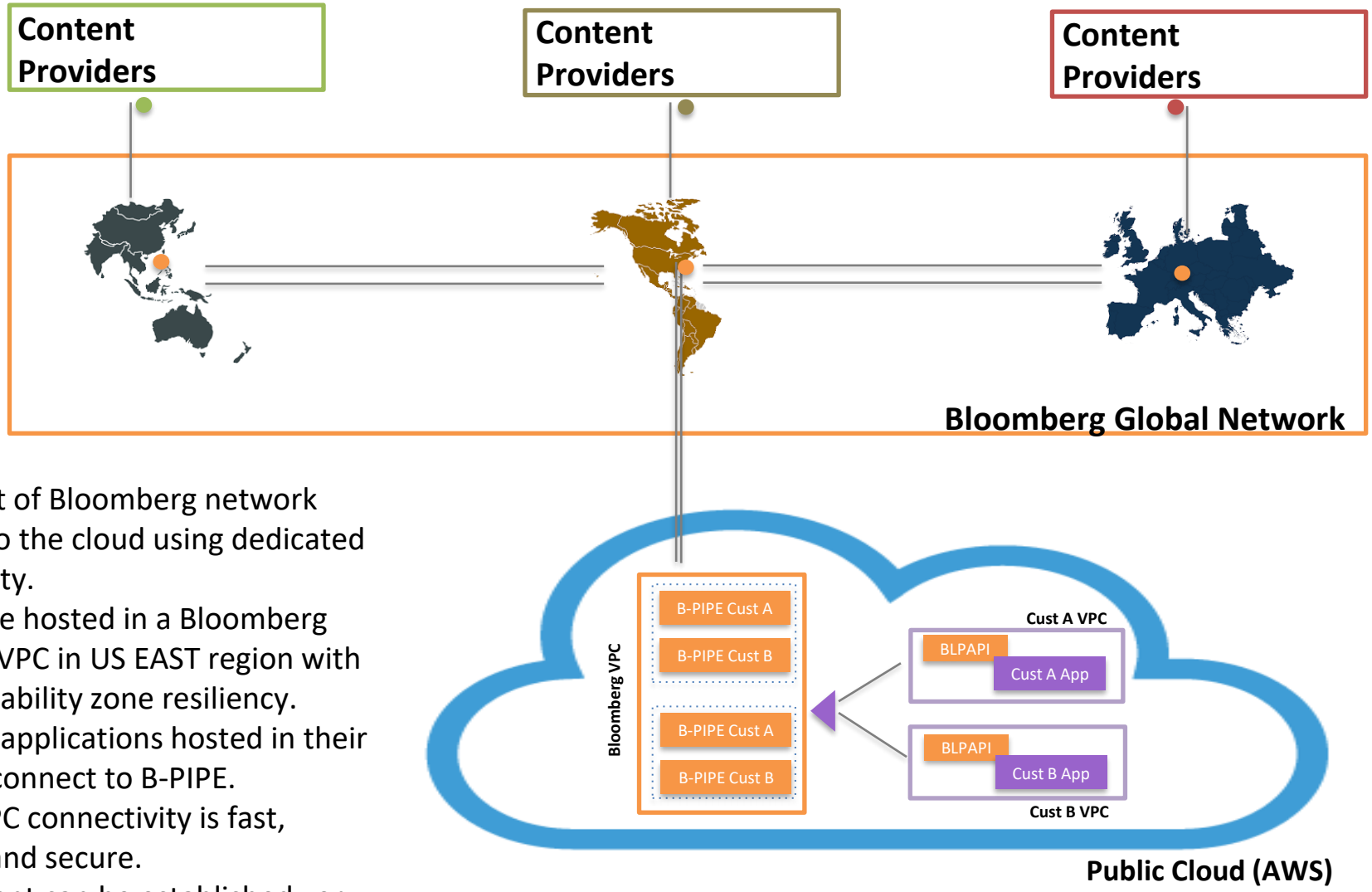
RiskVal + Bloomberg + AWS

How do you envision this partnership helping your clients?

This partnership will help our clients in the following ways:

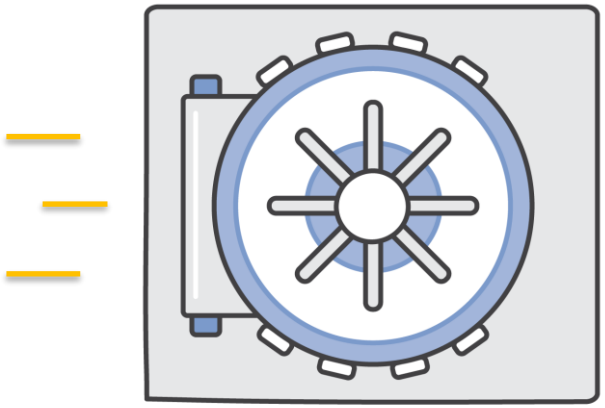
- Client can access our service anywhere in the world.
- No longer require heavy CPU service – can use on any platform.
- Makes software updates and maintenance very easy.

Example: RT in the Cloud w/ AWS US EAST

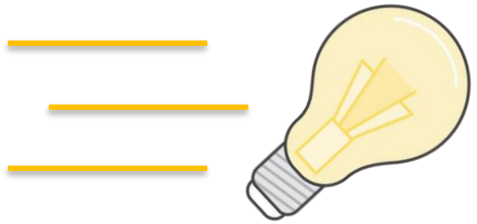


- Edge point of Bloomberg network moves into the cloud using dedicated connectivity.
- B-PIPES are hosted in a Bloomberg Managed VPC in US EAST region with cross availability zone resiliency.
- Customer applications hosted in their own VPC connect to B-PIPE.
- VPC to VPC connectivity is fast, resilient, and secure.
- Environment can be established very rapidly.

Democratization of technology

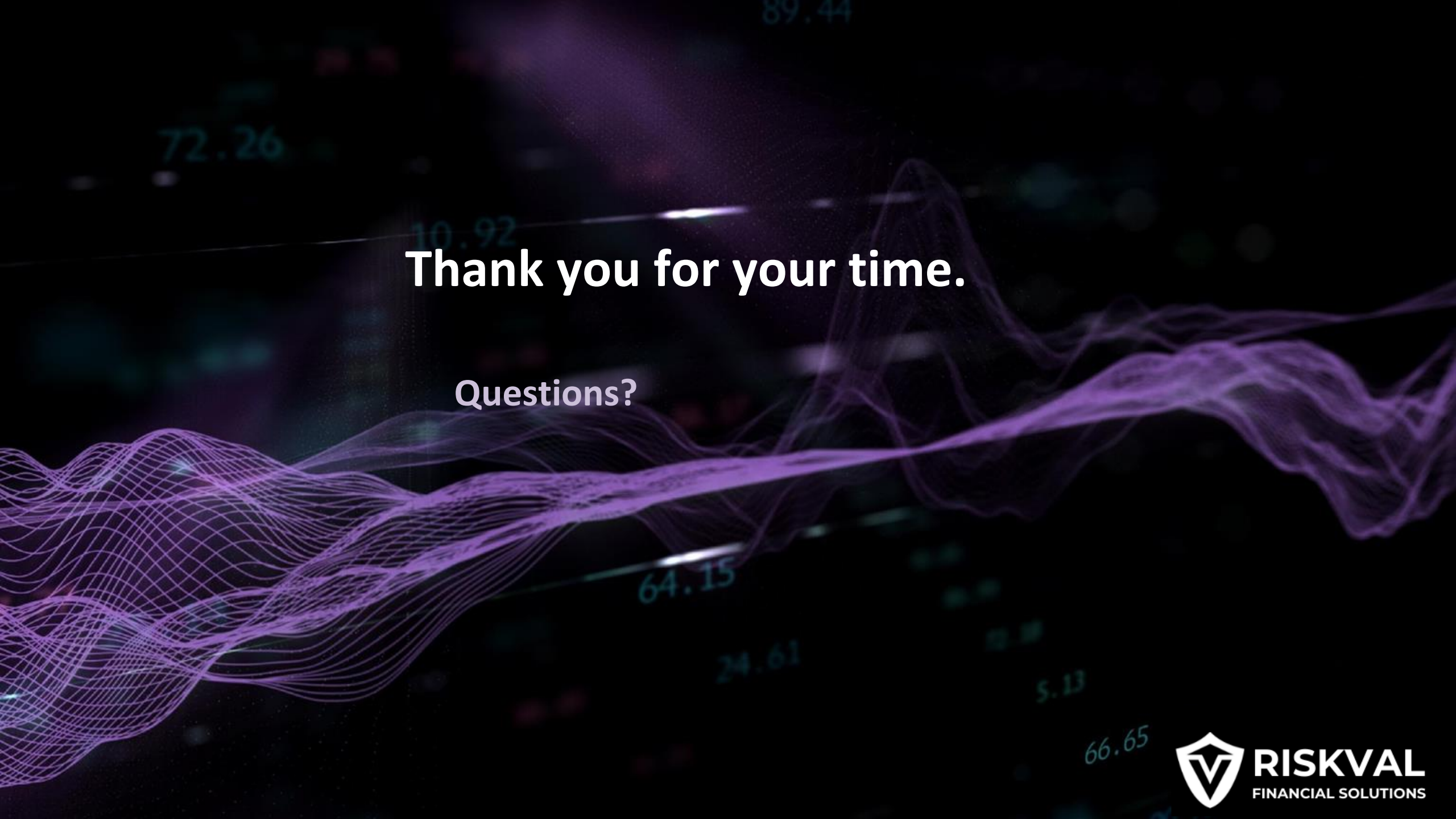


Size



Agility

Over the next 5 years, the most successful FinTech company will not be the biggest, but the fastest


Thank you for your time.
Questions?
RISKVAL
FINANCIAL SOLUTIONS

PANELIST

MICHAEL CORINO

Managing Director at Mizuho Securities Co., LLC.

LEIR RESEARCH INSTITUTE CONFERENCE 2021

NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Session #2
"Large Financial Institutions and Corporate FinTech Applications"

Q & A

NJIT New Jersey Institute of Technology

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for Business, Technology, and Society

Session # 3

FinTech Regulations and Startup Challenges

Presented by:
The Martin Tuchman School of Management

MODERATOR

STEVEN GOMEZ

Program Development Manager at New Jersey Institute of Technology

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KEYNOTE SPEAKER

JOHN SCHINDLER

Sr Associate Director, Division of Financial Stability at the Federal Reserve Board

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FinTech: How It's Different

John Schindler
August 27, 2021

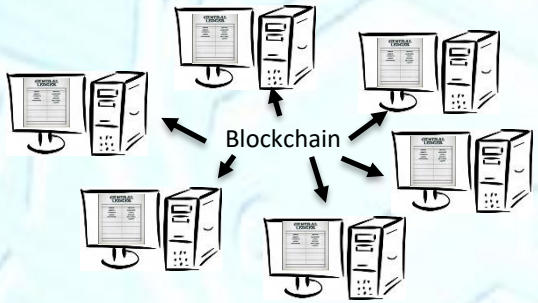
Disclaimer

The views presented in this presentation are my own and should not be taken to represent the views of the Board of Governors or the Federal Reserve System.

FinTech – A Definition

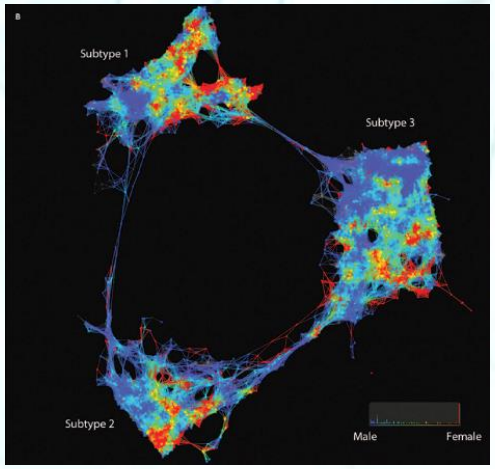
"Technologically-enabled financial innovation…with an associated material effect on financial markets and institutions and the provision of financial services" - FSB

Examples


Blockchain


LIBERTAS
AEQUITAS
VERITAS
2009
IN CRYPTOGRAPHY WE TRUST


Mobile Banking
Login:
Password:


Subtype 1
Subtype 3
Subtype 2
Male
Female

Question

How is FinTech different?

Question

How is FinTech different?

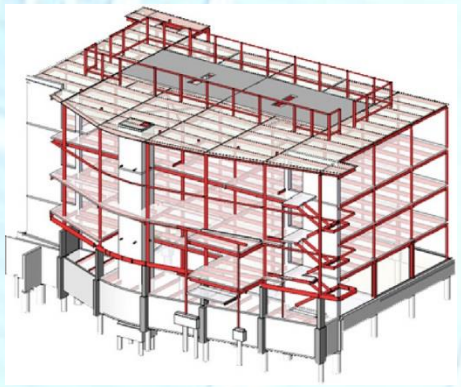
It is a deeper, more foundational innovation

The Depth of Financial Innovations

A building analogy

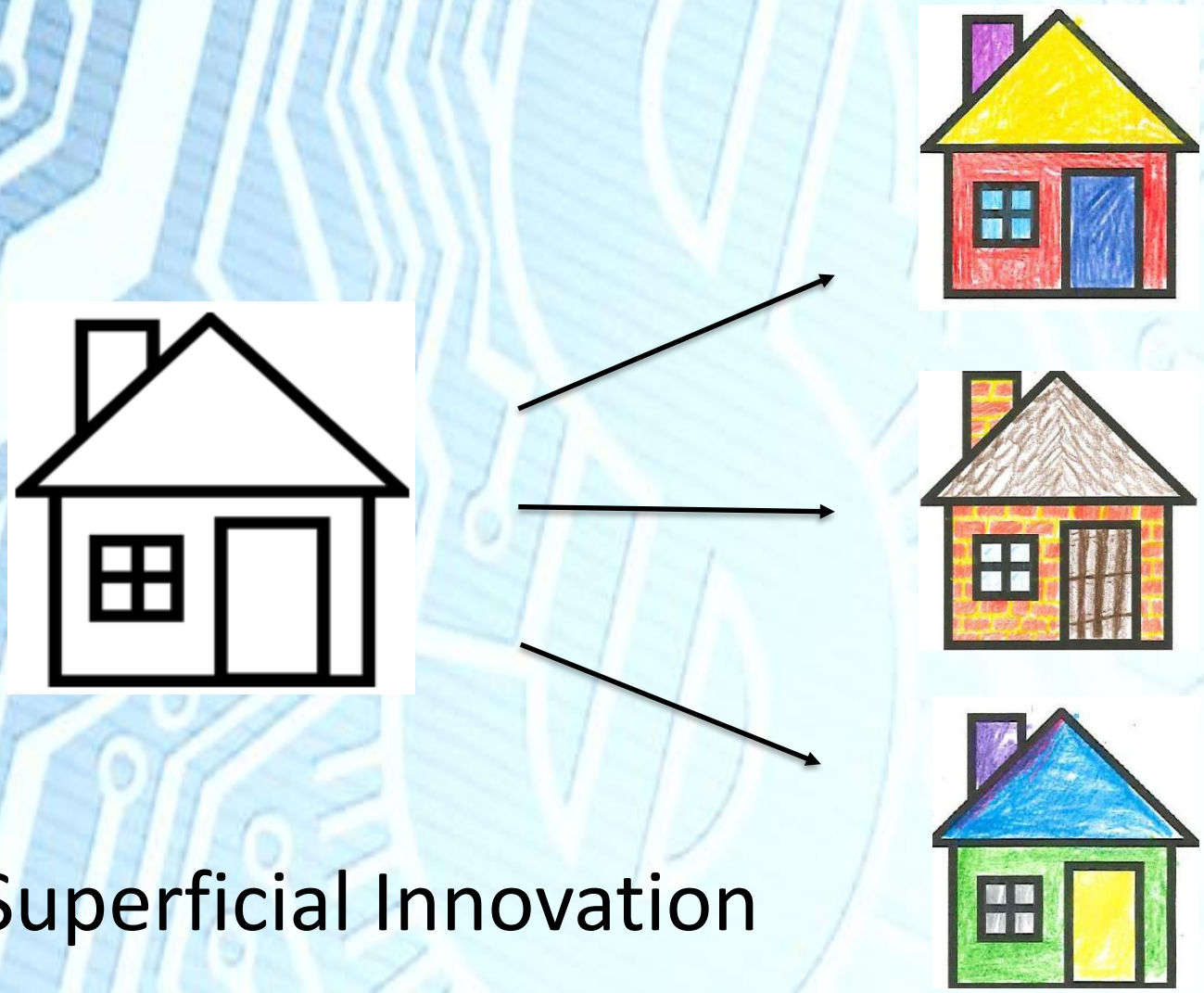
Foundation

Superstructure



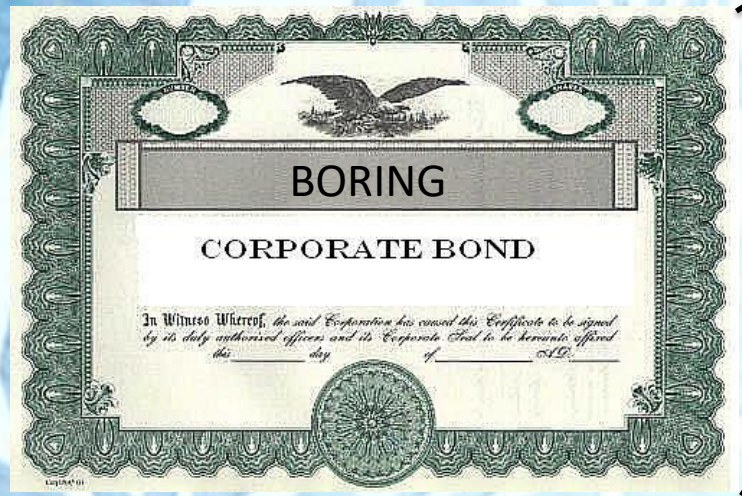
Features

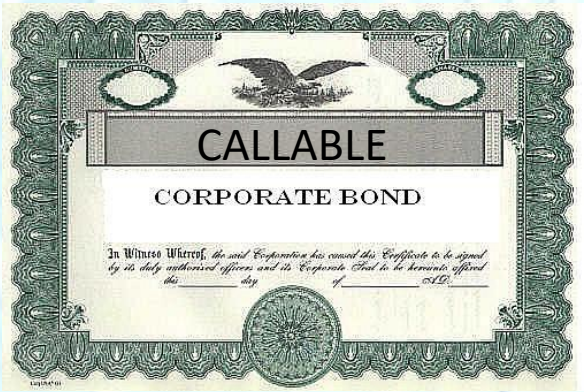
The Depth of Financial Innovations

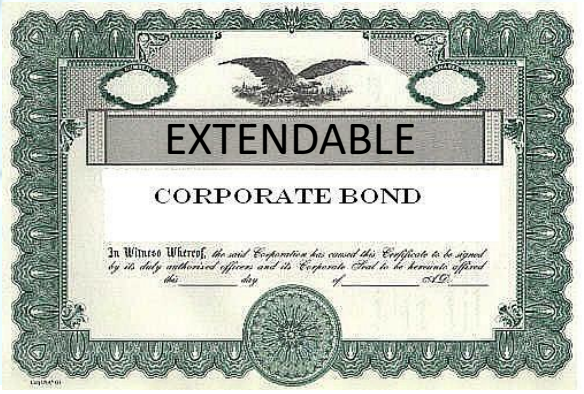


Superficial Innovation

The Depth of Financial Innovations







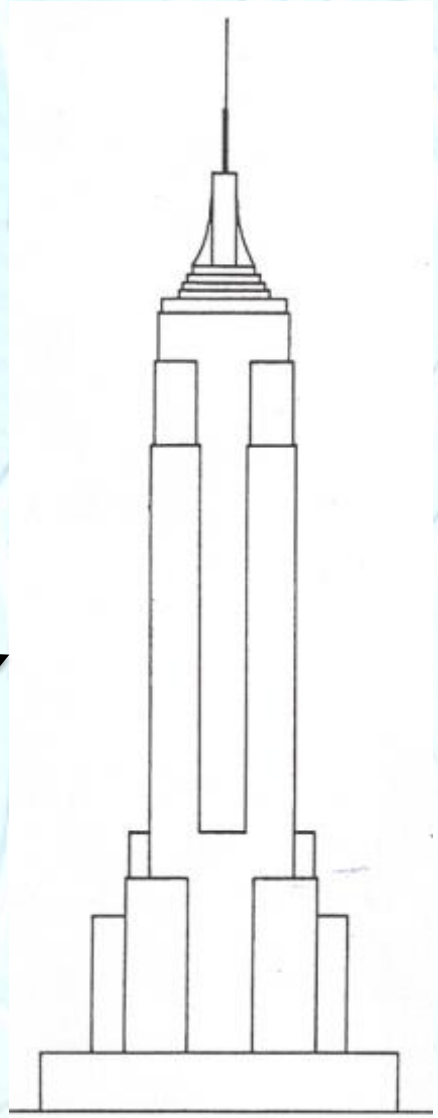
The Depth of Financial Innovations

Genuine Innovation

The Depth of Financial Innovations

The Depth of Financial Innovations

Foundational Innovation



The Depth of Financial Innovations

Blockchain-based
bond issuance

The Depth of Financial Innovations

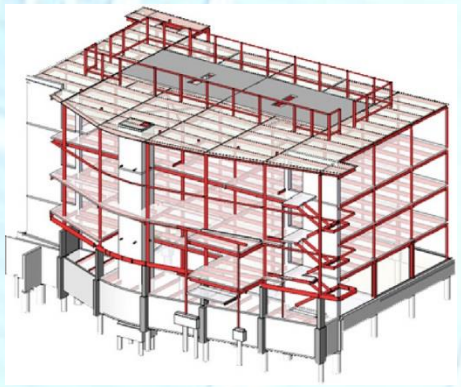
Blockchain – Why the hype?

Foundation

Blockchain Technology

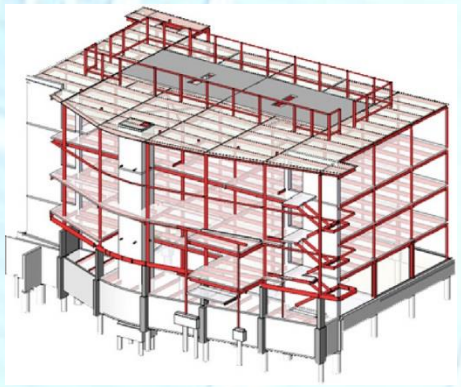
Blockchain – Why the hype?

Foundation	Superstructure
Blockchain Technology	Digital Currencies Smart contracts DAOs



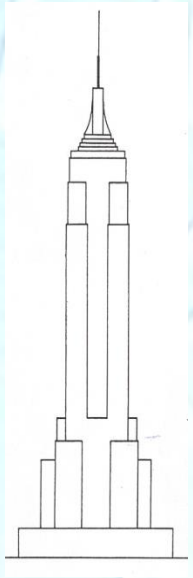
Blockchain – Why the hype?

Foundation	Superstructure	Features
Blockchain Technology	Digital Currencies Smart contracts DAOs	Stable coins 1000s of permutations



FinTech – Why is it different?

- Financial innovation is like a building
  - Features
  - Superstructure
  - Foundation



- Deeper changes have more profound effects

A counterargument?

"This is just another VOIP.

No one will notice the

difference."

Closing Thoughts on FinTech Regulation

- Financial transactions involve risk
- Same activity – Same regulation?
- Same risk – Same regulation?
- Consider benefits AND costs
- Start simple - definitions

PANELIST

MADYÉ PARRISH

Head of Product at MoCaFi

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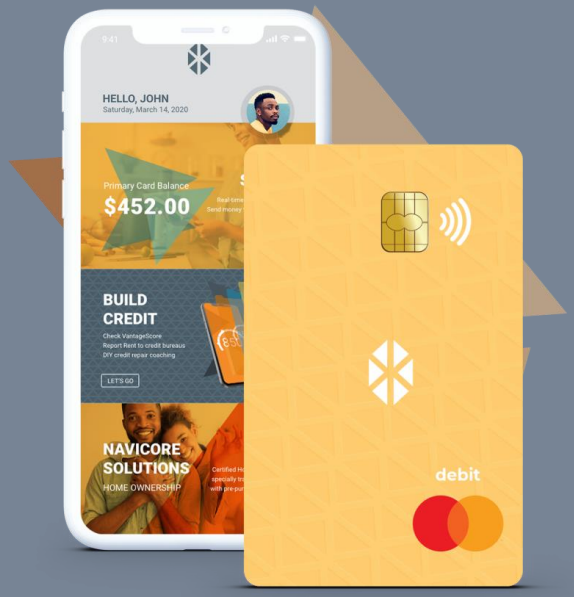
MOCAFI

Startup Challenges



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Madyé Parrish
Head of Product
Mobility Capital Finance [“MoCaFi”]

MoCaFi MISSION

To **close the wealth gap** with data-driven, **mobile banking** that offers lower-cost services, **builds credit** and helps provide financially **underserved communities** access to capital at **scale**

Disrupting the Definition of a Fintech Startup

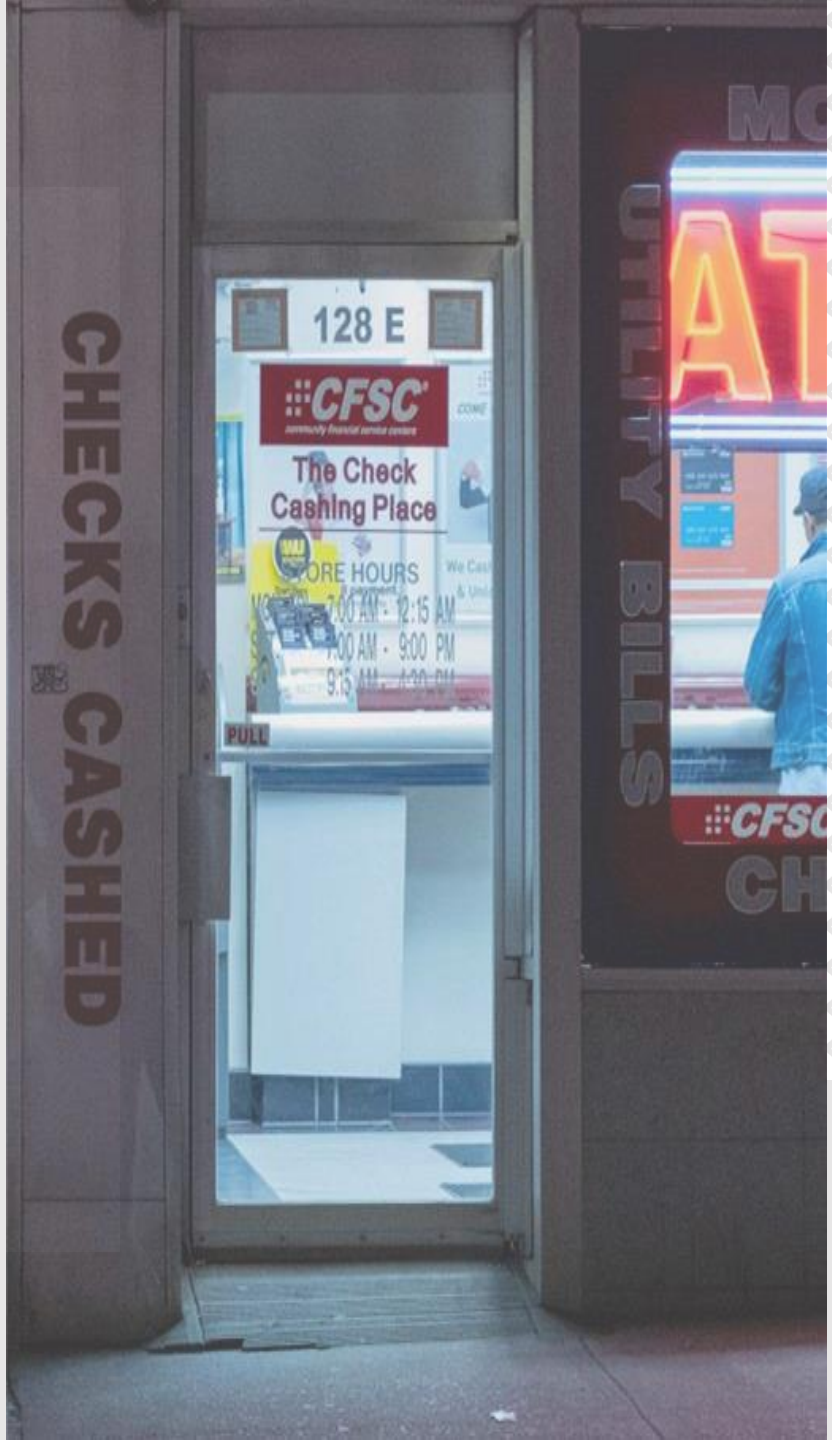
9,000 bank branches closed last decade*

Solving a hard-to-understand problem is hard

Cities seek solutions but can't act without the right partner

MoCaFi a **diverse-led** team of **financial executives**, **technologists**, **community organizers**, **activists**, and **makers** committed to breaking barriers to wealth building for all people, regardless of race, circumstance, or financial position.

*Federal Reserve Bank of New York



RISKS AND REWARDS

There is a direct correlation between success and expectations--internal or external
The key is to manage both against your short and long term KPI(s)

- Move at the speed of faith
- Reassess your pipeline frequently
- Embrace non-traditional partnerships
- Redefine innovation as a regular pulse check
- Develop talent and technology in parallel to maintain the moving target called “scale”

CHALLENGES GREAT AND SMALL

Challenges are amplified/magnified when the dependency is external

- Risk tolerance/product portfolio/agility of your financial sponsors
- 3rd parties that are critical your product
- Delivering beyond your current capacity

Innovation Over Competition

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PANELIST

JEWEL JENNINGS-WRIGHT

Head of Compliance at New York Shipping Exchange, Inc

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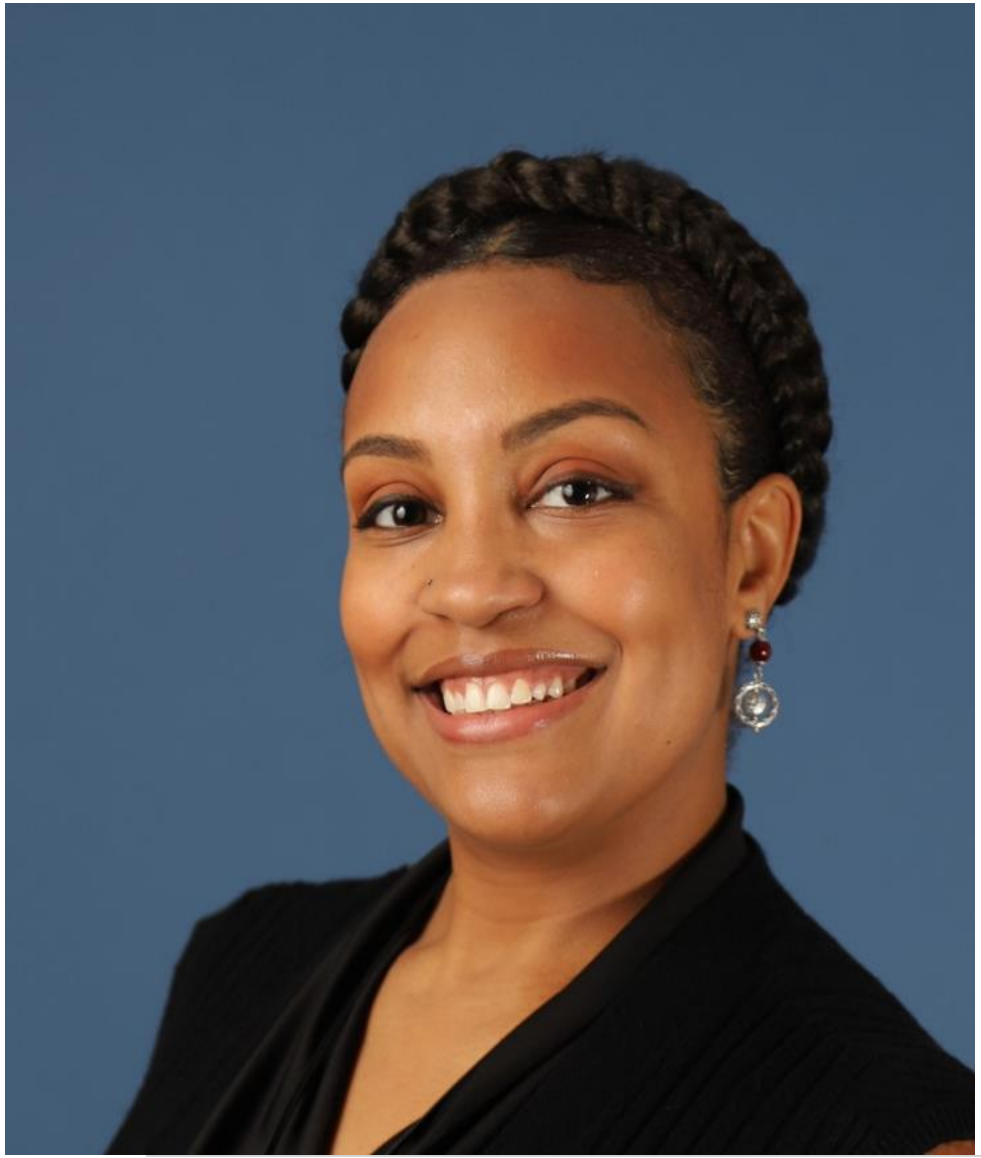
NYSHEX

Regulatory Burdens Facing Startups



Jewel Jennings-Wright

Head of Compliance, NYSHEX LLC

- Responsible for maintaining regulatory compliance programs.
- Joined NYSHEX in 2016
- Former counsel with the Federal Maritime Commission

New York Shipping Exchange (NYSHEX) is an independent provider of technology and contracting framework that enables effective digital shipping contracts. NYSHEX provides the following services:

- Digital Contracting Technology – allows shippers and carriers to e-sign service contracts where the terms can be customized but are always clear and fully enforceable.

- Performance Monitoring – independently tracks bookings and shipment milestones to ensure both the shipper and carrier see where contracts are off track, enabling corrective action.

- Processing of Damages – ensures exceptions are resolved fairly in NYSHEX contracts according to mutually agreed rules, saves shippers and carriers time, and avoids damage to relationships.

Confusion Regarding Rules

Regulations are narrow with specific definitions that usually do not include startups. As a result, starts ups, including those like NYSHEX, find themselves in a situation where **they are not specifically regulated but they participate in regulated activity** which can have its own unique set of rules.

Startups are multifaceted. As a result, they could face regulation by several agencies as opposed to just one, increasing their regulatory burden.

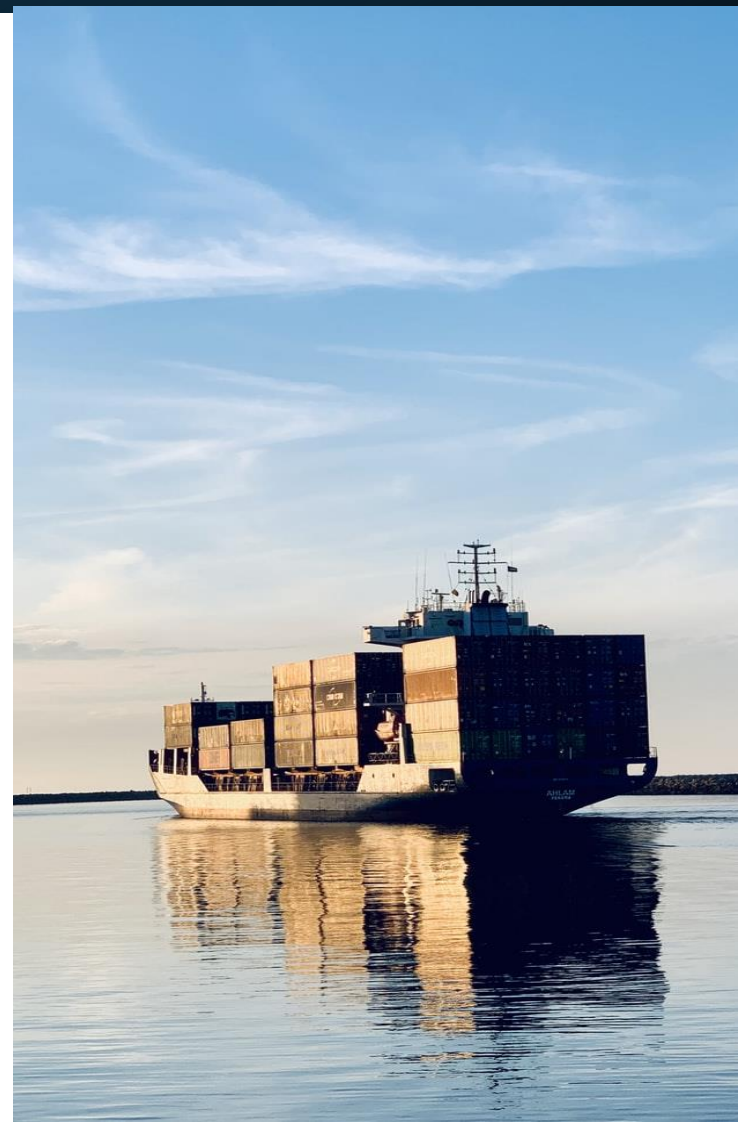
In the United States alone there are local, state, and federal level jurisdictions. As startups grow, they may have to **navigate a myriad of conflicting rules and procedures** to ensure compliance.

Lack of Collaboration

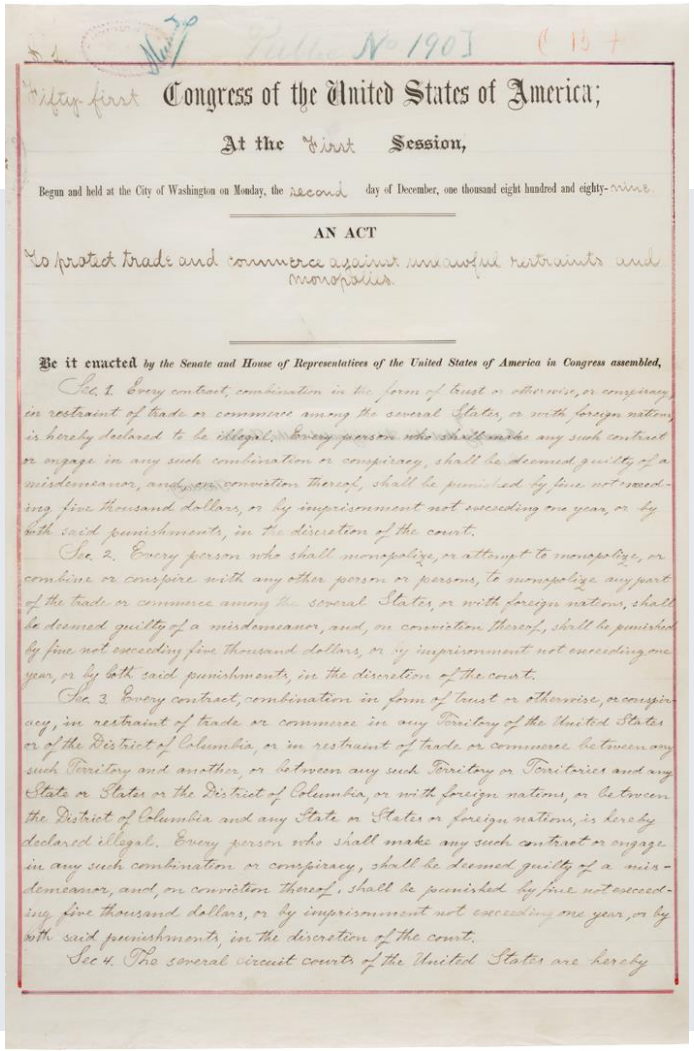
Communicating the business model to regulators can also be difficult. Maintaining engagement from regulators when the startup is not a fully regulated entity is crucial to establish a collaborative process.

Regulators do not offer endorsements. This is true even when the product offered provides significant benefits to the industry.

However, a more collaborative approach can give Fintech and other startups have a **unique opportunity to have a say in the regulatory process**.



Innovation
Outpaces regulation



Fifty-first Congress of the United States of America;

At the First Session,

Begun and held at the City of Washington on Monday, the second day of December, one thousand eight hundred and eighty-nine.

AN ACT

To protect trade and commerce against unlawful restraints and monopolies.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Sec. 1. Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is hereby declared to be illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 2. Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 3. Every contract, combination in form of trust or otherwise, or conspiracy, in restraint of trade or commerce in any Territory of the United States or of the District of Columbia, or in restraint of trade or commerce between any such Territory and another, or between any such Territory or Territories and any State or States or the District of Columbia, or with foreign nations, or between the District of Columbia and any State or States or foreign nations, is hereby declared illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 4. The several circuit courts of the United States are hereby

The regulatory process around startups tends to be reactive. Innovation happens well before changes to regulation.

Even after the reaction, the regulatory process, especially in the United States, is slow.

Thank you

Jewel Jennings-Wright
Head of Compliance
J.Jennings-Wright@NYSHEX.com
NYSHEX, LLC

NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Session #3
"FinTech Regulations and Startup Challenges"

Q&A

NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Leir Research Institute's Virtual Conference 2021

Disruptive Technologies, Regulations, Business – Implications in the FinTech Industry

Friday, August 27, 2021

9:00 A.M. - 1:00 P.M.

New Jersey Institute of Technology

Martin Tuchman School of Management

Leir Research Institute

NJIT New Jersey Institute of Technology

Henry J. and Erna D. Leir Research Institute
for Business, Technology, and Society

Thank you all for coming!