

OPEN DAY

MSc-Master of Science Business Economics with Analytics

A modern graduate program
that combines strong background
in economics with cutting-edge
methods in data analytics

OPEN DAY

**MSc-Master of Science
Business Economics with Analytics**

Περιεχόμενα

- Στόχος & Δομή Σπουδών
- Παρουσίαση Θεματικών
- Συνεργασίες με Επιχειρήσεις και Οργανισμούς
- Προοπτικής Καριέρας και Εντυπώσεις Αποφοίτων

MSc-Master of Science Business Economics with Analytics



Βασικοί Καθηγητές



Αναπλ. Καθηγητής Σπύρος Παγκράτης,
Τμήμα Οικονομικής Επιστήμης,
Διευθυντής ΠΜΣ «Επιχειρηματική
Οικονομική με Αναλυτικές Μεθόδους»



Καθηγητής Ηλίας Τζαβαλής,
Τμήμα Οικονομικής Επιστήμης,
Διευθυντής ΠΜΣ «Εφαρμοσμένα
Οικονομικά και Χρηματοοικονομικά»



Αναπλ. Καθηγητής
Ευάγγελος Διοικητόπουλος,
Τμήμα Οικονομικής
Επιστήμης



Επικ. Καθηγητής
Αχιλλέας Βασιλόπουλος,
Τμήμα Αγροτικής Οικονομίας και
Ανάπτυξης, Γεωπονικό Πανεπιστήμιο
Αθηνών



Αναπλ. Καθηγητής Ιωάννης Βρόντος
Τμήμα Στατιστικής



Επ. Καθηγητής Άγγελος Αλεξόπουλος,
Τμήμα Οικονομικής Επιστήμης



Αναπλ. Καθηγητής Φώτης Παπαηλίας,
Kings College London, Deputy Director of
Data Analytics for Finance and Macro
(DAFM) Research Centre.



Επικ. Καθηγητής Φάμπιο Αντωνίου,
Τμήμα Οικονομικής Επιστήμης



Επικ. Καθηγητής Ιωάννης Κοσπεντάρης,
Τμήμα Οικονομικής Επιστήμης

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🎓 3 Βασικά Ερωτήματα για να ξεκινήσουμε σωστά...

✓ Θα είναι το Μεταπτυχιακό που επιλέγω ακόμα σχετικό σε 10+ χρόνια;

📈 Είναι προσαρμοσμένο στις αλλαγές της αγοράς και της τεχνολογίας;

✓ Προσφέρει το Μεταπτυχιακό ισχυρές προοπτικές καριέρας από την πρώτη κιόλας μέρα;

🚀 Σε συνδέει άμεσα με την αγορά εργασίας;

✓ Μου δίνει το Μεταπτυχιακό εφόδια να ανακαλύψω αυτό που πραγματικά με εμπνέει;

🔍 Με βοηθά να καταλάβω τι θέλω να κάνω επαγγελματικά;

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Στόχος του Προγράμματος

Γεφυρώνει την **Οικονομική Επιστήμη** και την **Επιστήμη Δεδομένων**

- Παρέχει εκπαίδευση σε **εφαρμοσμένα οικονομικά** με σύγχρονες μεθόδους **οικονομετρίας** και **μηχανικής μάθησης (machine learning)**, σε γλώσσες προγραμματισμού **R & Python**.
- Εφοδιάζει με **προηγμένες δεξιότητες** ανάλυσης **δεδομένα υψηλών διαστάσεων**, δομημένων ή μη, για **επίλυση σύνθετων προβλημάτων** και παροχή **καινοτόμων** λύσεων.
- Εξασφαλίζει **υψηλές προοπτικές καριέρας** σε συμβουλευτικές εταιρείες, επιχειρήσεις και οργανισμούς, τράπεζες και χρηματοοικονομικές αγορές.

Δομή Σπουδών 90 ECTS

Προπαρασκευαστικά μαθήματα (1-19 Σεπ. 2025)

Seminars in R, Introduction to Statistic, Introduction to Microeconomic Theory

MSc in Business Economics with Analytics (**full-time, 4-day week**)

- Α εξάμηνο: 4 υποχρεωτικά μαθήματα
- Β εξάμηνο: 2 υποχρεωτικά & 3 επιλογής
- Γ εξάμηνο: διπλωματική εργασία

MSc in Business Economics with Analytics (**employee-friendly, 2-day week**)

- Α εξάμηνο: 2 υποχρεωτικά μαθήματα
- Β εξάμηνο: 2 υποχρεωτικά & 1 επιλογής
- Γ εξάμηνο: 2 υποχρεωτικά μαθήματα
- Δ εξάμηνο: 2 επιλογής
- Γ, Δ εξάμηνο: διπλωματική εργασία

Ενότητες - modules

Industrial Organization and Strategy, Market Analysis and Portfolio Management, Analytical and Computational Data Methods for Economics, Quantitative Methods, Computational Econometrics for Economics and Finance, Data Analytics for Applied Macroeconomics and Finance, Behavioral Economics, Data Analytics for Applied Microeconomics and Business Strategy, Macroeconomics of Financial Markets, Financial Data Analytics, Corporate Finance, Financial Derivative Products

Βασικές Γλώσσες Προγραμματισμού

R, Python

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Εύρος Δεξιοτήτων: Ενδεικτικές θεματικές διπλωματικών εργασιών, ακαδημαϊκού έτους 2024–2025

 ***Data Science & Machine Learning in Economics***

 ***Finance, Investment & Risk Analysis***

 ***Environment & Climate***

 ***Public Policy, Labour & Macroeconomics***

 ***Consumer & Household Economics***

 ***Sports Economics***

Απεριόριστες Προοπτικές Καριέρας

Συνδυάζουμε τη δύναμη των οικονομικών με προηγμένες τεχνολογικές μεθόδους ανάλυσης δεδομένων, αναδεικνύοντας ηγετικά στελέχη με ικανότητες στην:

- **εφαρμοσμένη οικονομική ανάλυση με δεδομένα υψηλών διαστάσεων** για ανάπτυξη επενδυτικών στρατηγικών και διαχείριση κινδύνων (risk management).
- **επίλυση σύνθετων προβλημάτων** στα χρηματοοικονομικά, εφαρμοσμένη βιομηχανική οργάνωση, μακροοικονομική, συμπεριφορά καταναλωτή, επιχειρηματική στρατηγική, συμβουλευτική.
- **ανάπτυξη καινοτομίας** στο πλαίσιο επιχειρηματικών και επενδυτικών αποφάσεων.

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Με την αξιοπιστία του Τμήματος Οικονομικής Επιστήμης του ΟΠΑ
Διαχρονικά κορυφαίου τμήματος οικονομικών επιστημών στην Ελλάδα



Πηγή: h.kathimerini.gr

Strategic Partnership with the European Investment Bank Group

Four lectures by EIB Group executives:

1. Why an Investment Bank for Europe: economic impact and political role
2. Project cycle & activities in Greece - **Case study**
3. EIF Presentation & activities in Greece
4. The EIB Climate Bank Roadmap



Thematic cooperation with Deloitte

On-site Workshop with Value Creation Services (VCS) Team, as part of Corporate Finance elective course



Focus on:

1. Restructuring & Value Creation (Performance Improvement)
2. Supporting private equity-backed businesses and corporates to take an accelerated lens to performance improvement
3. Delivering advancements to cash flow & EBITDA position



Strategic Partnership with Intrum Hellas

A market leading credit management organization with heavy use of data analytics

Intrum Academic Excellence Awards

Χρηματικά βραβεία υψηλών βαθμολογικών επιδόσεων στις εξετάσεις

Intrum Next Generation Program - NGP

Ευκαιρίες συμμετοχής στο πρωτοποριακό διεθνές πρόγραμμα πλήρους απασχόλησης NGP σε τομείς στρατηγικής και data analytics



Delegations to Econometric Game



Econometric Game at the **University of Amsterdam** is the **World Championship in Econometrics**

Our very own [Ilias Stavrianopoulos](#), [George Malanos](#), and teammates [Lampis Tzai](#) and [Ioannis Styliadis](#) represented **Greece** at the **Econometric Game 2025** 🌐

Advanced to the **Top 10 Finalists**, tackling a real-world challenge:

🏢 Forecasting and classifying grid congestion events in Germany and proposing targeted, data-driven energy policy solutions.

Their approach?

- ◆ Machine Learning (XGBoost)
- ◆ Custom-developed variant of a minority oversampling technique
- ◆ Policy recommendations based on counterfactuals and partial dependency plots

They stood out among 31 top-tier universities including **Harvard, Oxford, Cambridge, National University of Singapore, Seoul National University, Sciences Po, University of Amsterdam, Carlos III, Erasmus, Copenhagen, Stockholm, Maastricht.**



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ΕΛΛΑΔΑ

Τα hot μεταπτυχιακά του Οικονομικού Πανεπιστημίου Αθηνών



Ευχαριστούμε για την προσοχή σας

[Πληροφορίες για το Πρόγραμμα](#)

[Υποβολή αίτηση](#)

✦ Technical Appendix: Indicative module content, tools & outcomes

- **Industrial Organization & Strategy**

Understanding firm behavior, market structures, and competitive strategies

- **Behavioural Economics**

Insights into decision-making processes and real-world economic behaviour

- **Analytical and Computational Data Methods**

Econometric analysis, optimization, and data-driven modelling techniques

- **Python for Business Economics and Finance**

Practical programming skills for economic modeling, financial analysis, and business applications

- **Data Analytics for Applied Microeconomics & Business Strategy**

Using data to drive insights in consumer behavior, firm performance, and strategic planning

- **Big Data & Machine Learning for Policy and Markets**

Tools and models to interpret large-scale datasets, forecast trends, and support policy design

- **Financial Data Analytics**

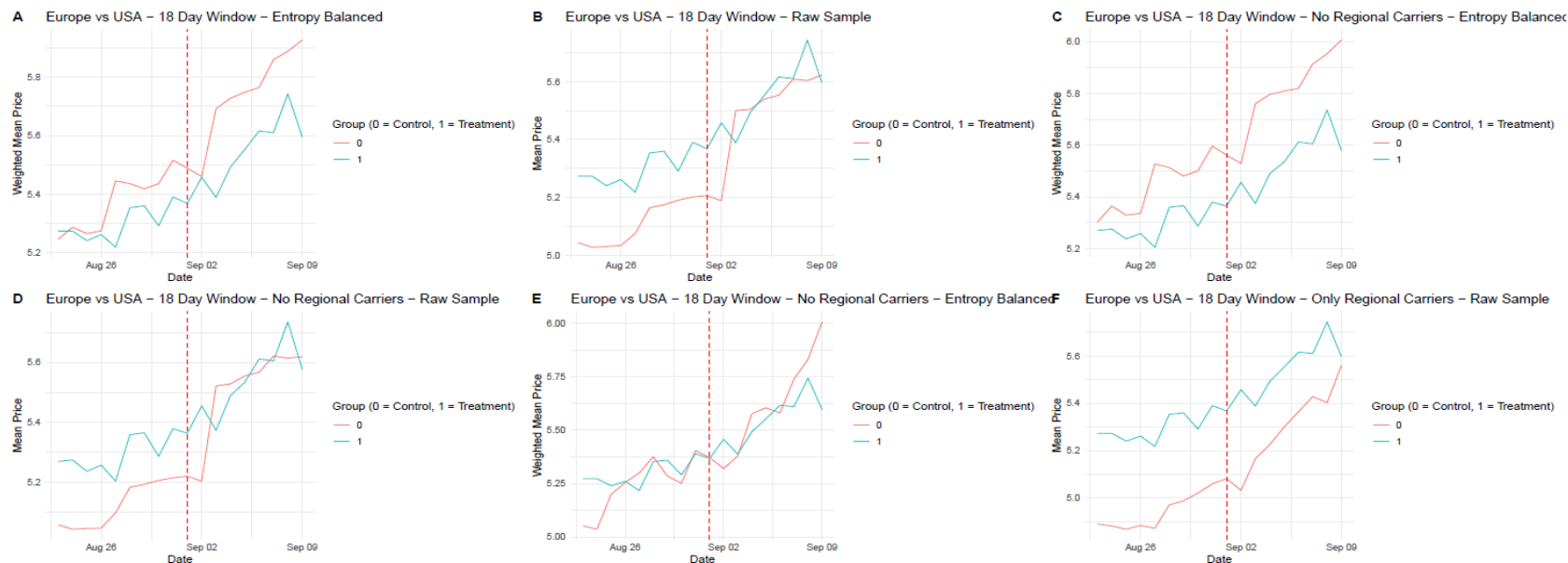
Techniques for analyzing financial markets, instruments, and investment performance

- **Macroeconomics of Financial Markets**

Interactions between macroeconomic policy, economic cycles, and financial systems

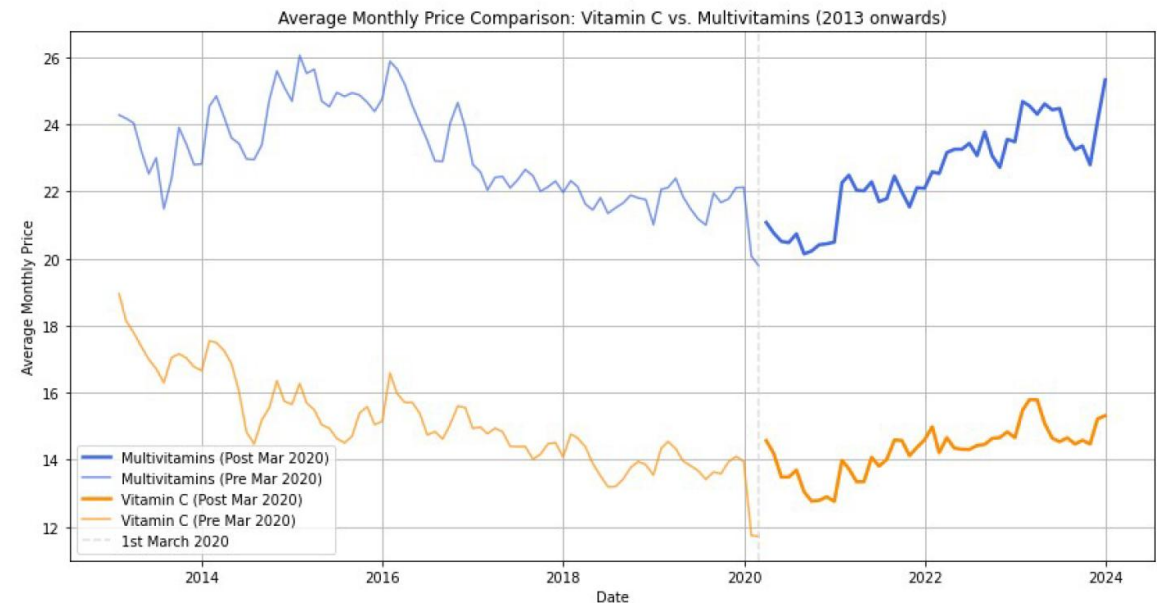
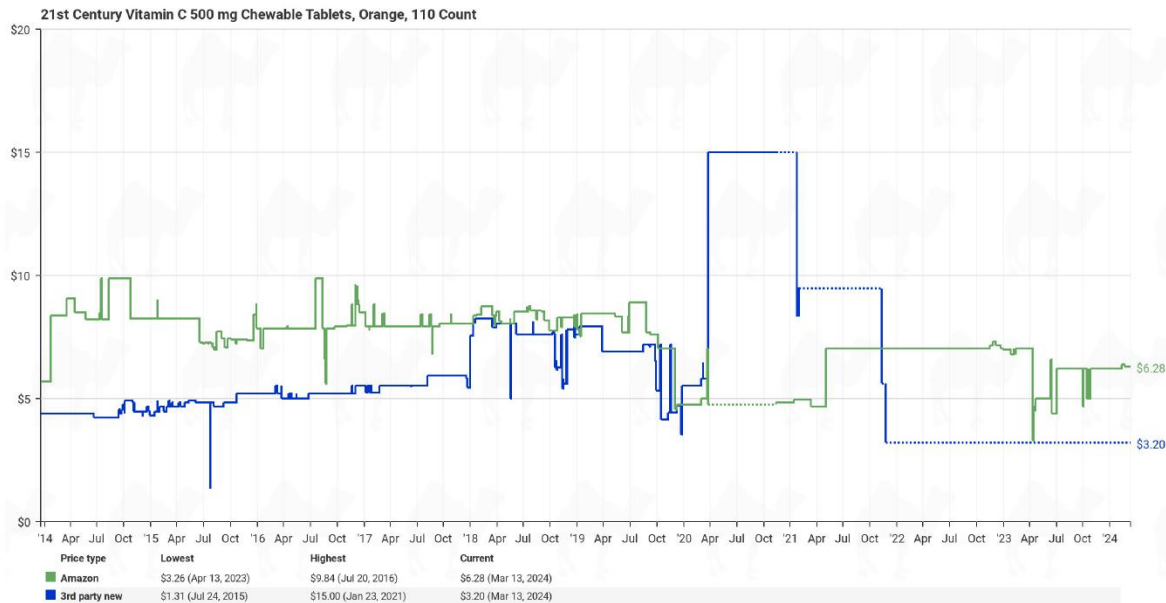
Industrial Organization (IO) & Strategy

- Optimal pricing, linear and non-linear pricing (algorithmic pricing)
- Competition & collusion, cartel formation, competition policy, M&A, relative markets
- Business strategies: commitments, foreclosure, exclusion
- Industry analysis
- Behavioral IO
- Every chapter combined with tools analyzing causal problems in IO using R & Python



IO & Strategy: Tools & Achievements

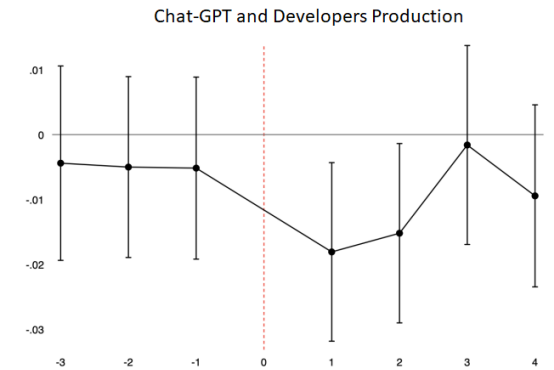
- Writing reports (white papers on competition & regulation)
- Problem solving, analytical and case studies based
- Introduction in survey design
- Run your own model: Collect, clean data & apply it to a real-world problem
- Introduction to other modules (e.g. Behavioral Economics, Analytical Methods in Applied Micro & Business)



Behavioural Economics: Applications in Economics, Business and Finance

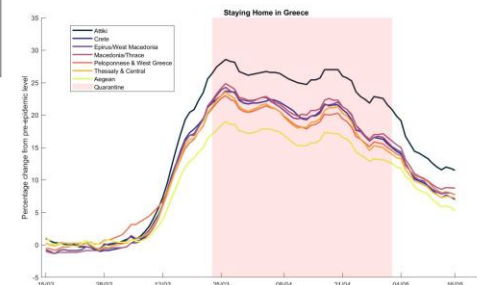
Behavioural Microeconomics

- **Chat-GPT** and Developers Production
- Reputation mechanisms (**FreeNow** and **Uber** in Athens)
- **Auctions** and **company takeovers**
- Effect of Covid-19 lockdown measures (**Google Mobility Data** — **Big4**)



Behavioural Macroeconomics and Finance

- **Google trends** using **R** and **Python** and GDP Dynamics
- Rise of Experiences Economy (**AirBnB**)
- **CEOs** firm decisions
- **Investors Financial Decisions:** Stock Market Participation
- Culture and Multinational **Marketing** Strategies (**Amazon/Skroutz**)
- **Inflation Expectations**

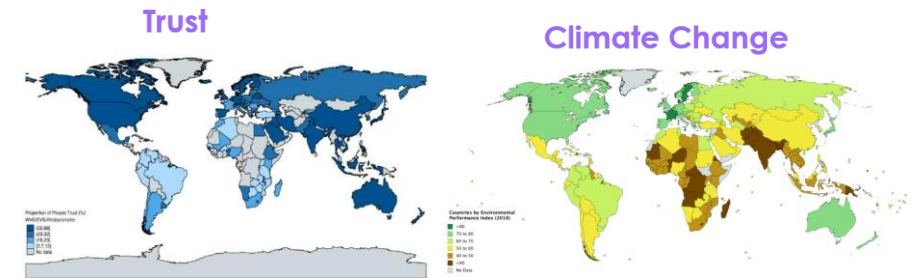


"Humans are not machines. React in many ways. Everything is all about human behavior.

However, Economic Theory in Collaboration with Machines can predict it insanely well"

Behavioural Economics: Tools & Achievements

- Μεθοδολογία Πραγματοποίησης Οικονομικών Πειραμάτων
- Παραγωγή, Ανάλυση, Πρακτική Εφαρμογή Δεδομένων
- **Spatial Analysis** 
- **Text Mining - Sentiment Analysis** 
- **Scrapping Social Media** to Extract Consumer Preferences 
- Numerical **Simulations** of Economic Models 
- **Mapping** tools
- Σύνταξη **Ερευνητικού Δοκιμίου**
- **Παρουσίαση Εργασίας**



Analytical and Computational Data Methods

Application of data analytics methods by using R

- Leading language in data science and statistics
- Free-open source program with functions and libraries used both in industry and academia; requiring standard computer software
- Excellent graphical capabilities
- Seamless integration with other popular languages: e.g. C/C++, MATLAB...
- Easily connected with databases: e.g. Oracle, MySQL...

 15,390
active packages

 8,753
package maintainers

 346
updates last week

 31,533,083
downloads last week

Analytical and Computational Data Methods

Time series forecasting: stock returns, sales, growth rates

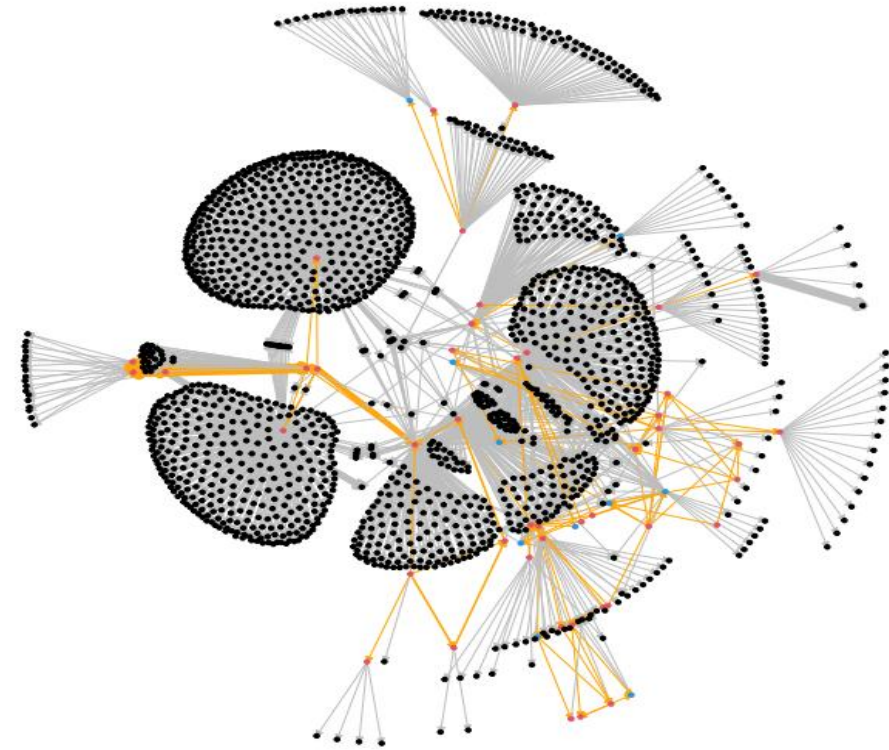
- Supervised machine learning: penalized regression, decision trees, random forests, neural networks

Causal inference: evaluation of policy changes

- Fixed effects regression models
- Diff in Diff and synthetic controls

Fraud detection: credit card systems, tax organizations

- Unsupervised machine learning: clustering, nearest neighbor



Identification of clusters with fraudulent activity

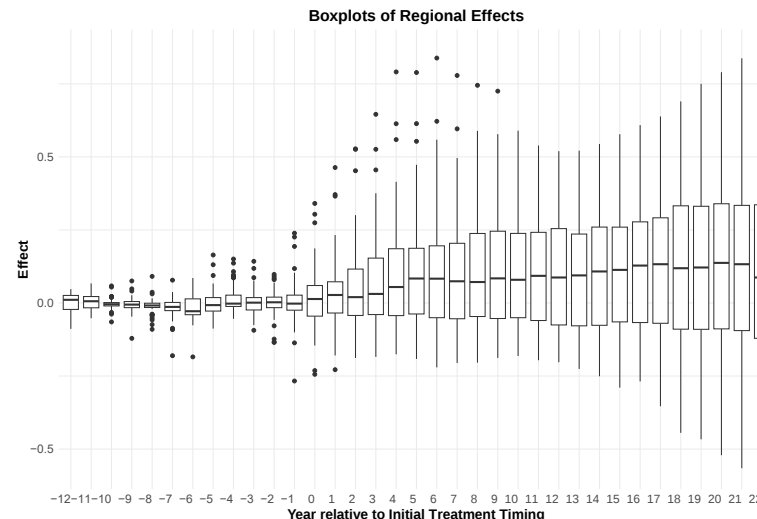
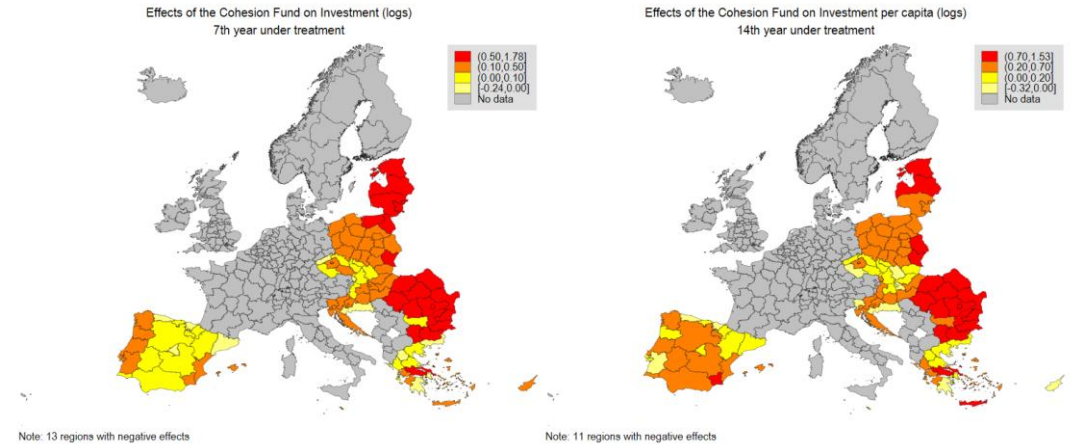
Analytical and Computational Data Methods

- **Nowcasting/Forecasting of macroeconomic indices**

Random forests, factor models, causal inference

- **Microeconometrics: labor economics, public economics**

Analysis of panel data: time series regression, factor models



Measuring the Effect of Cohesion Funds in the Eurozone

Python for Business Economics and Finance

Why to learn Python (additionally to R)?

Versatility: used for a **wide range of applications**, from web development and scripting to scientific computing and machine learning

Free open-source program with **clear and readable** syntax (easy to learn)

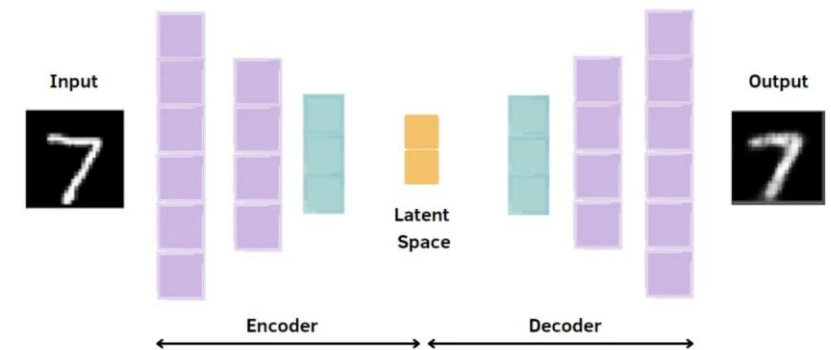
Powerful tools for Machine Learning and Artificial Intelligence: TensorFlow, Keras and Pytorch developed originally in Python

Leading language for modern applications: far superior for web-scraping, numerical analysis and sentiment text analysis

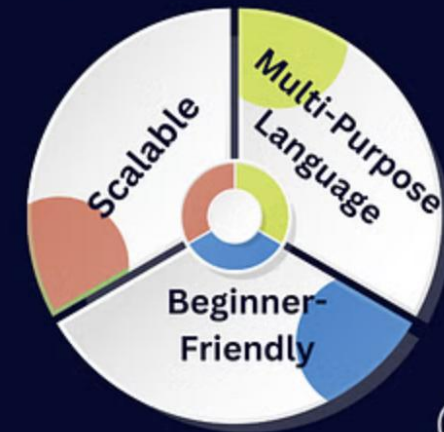
Excellent optimization libraries

Increasing use in economics and finance

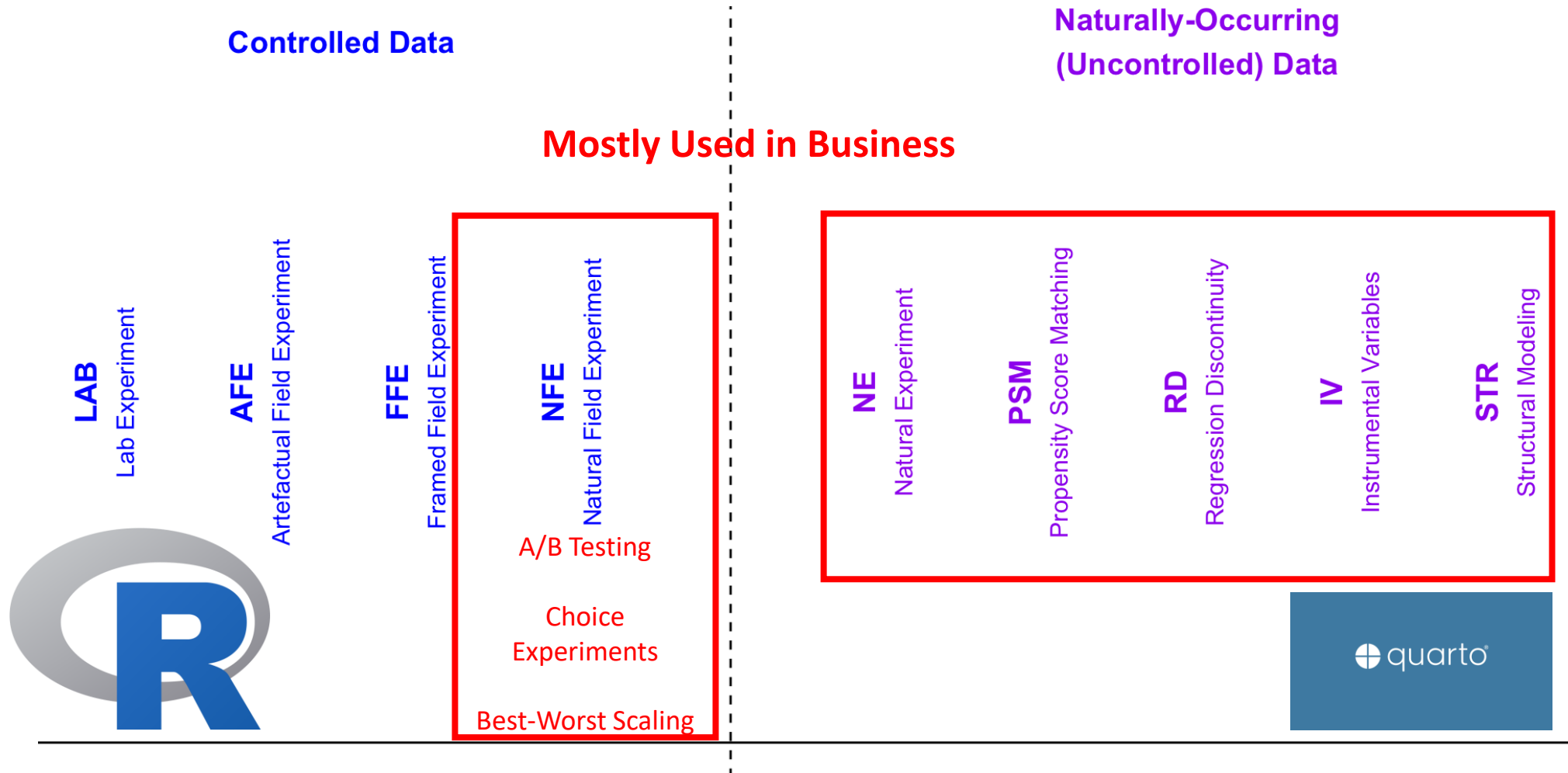
Generative modelling through autoencoders



Why Python for Data Science?



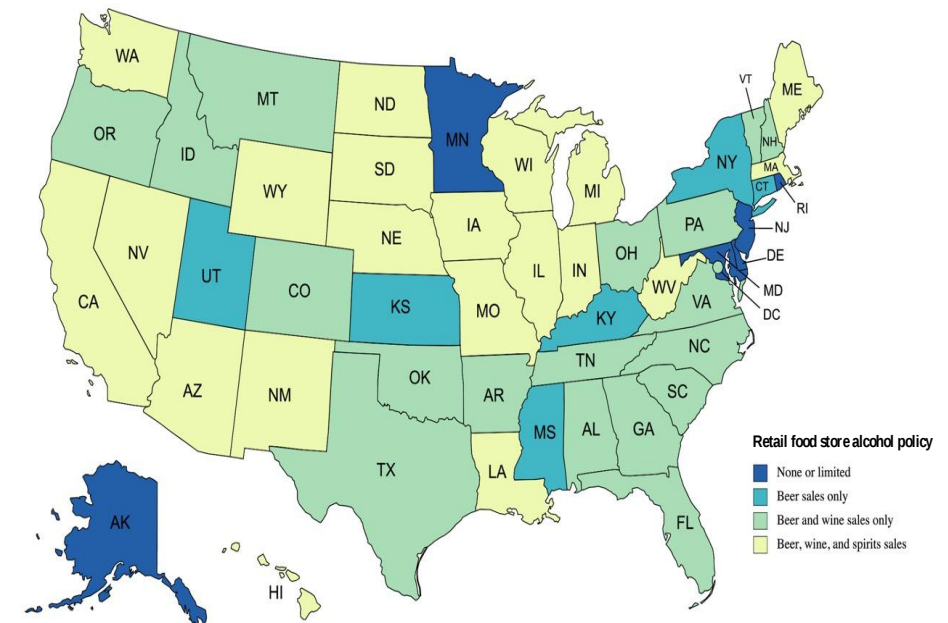
Data Analytics for Applied Microeconomics & Business Strategy



Data Analytics for Applied Microeconomics & Business Strategy

Causal Effect of Policy Changes : Effect of TN Liberalization of wine sale in grocery stores on liquor stores

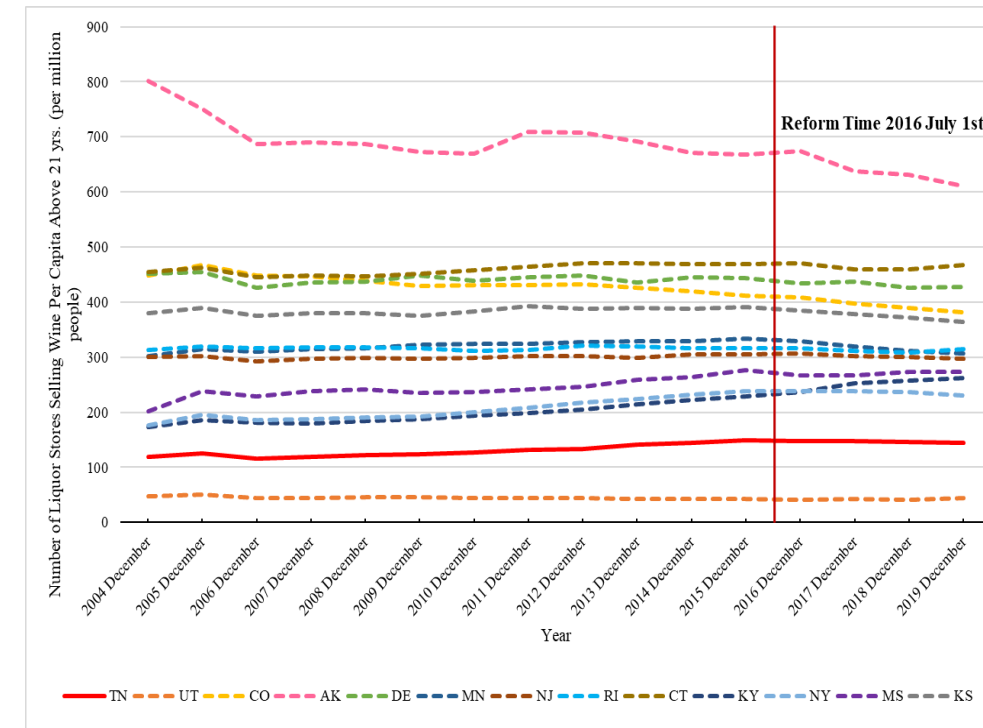
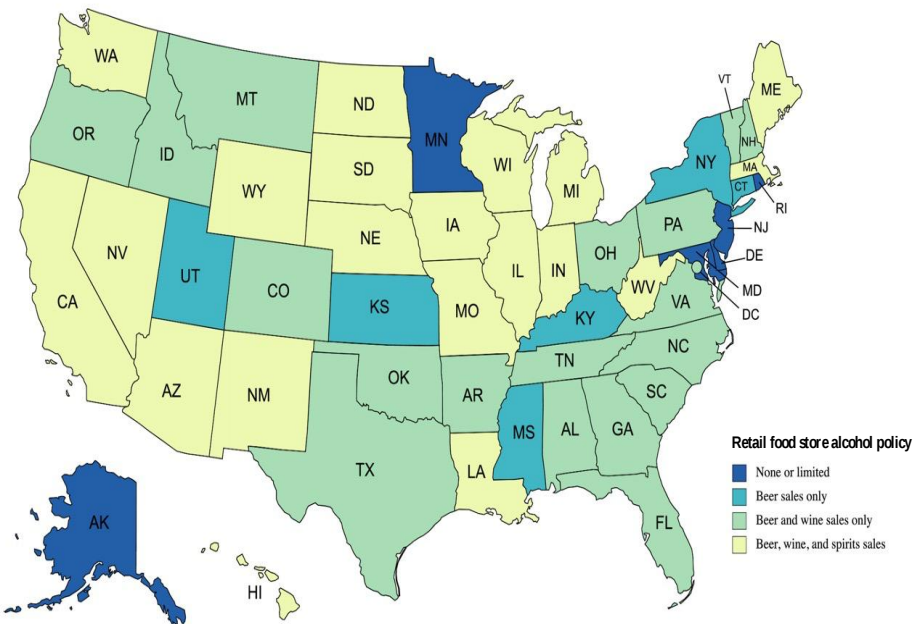
Synthetic Control Method



Data Analytics for Applied Microeconomics & Business Strategy

Causal Effect of Policy Changes : Effect of TN Liberalization of wine sale in grocery stores on liquor stores

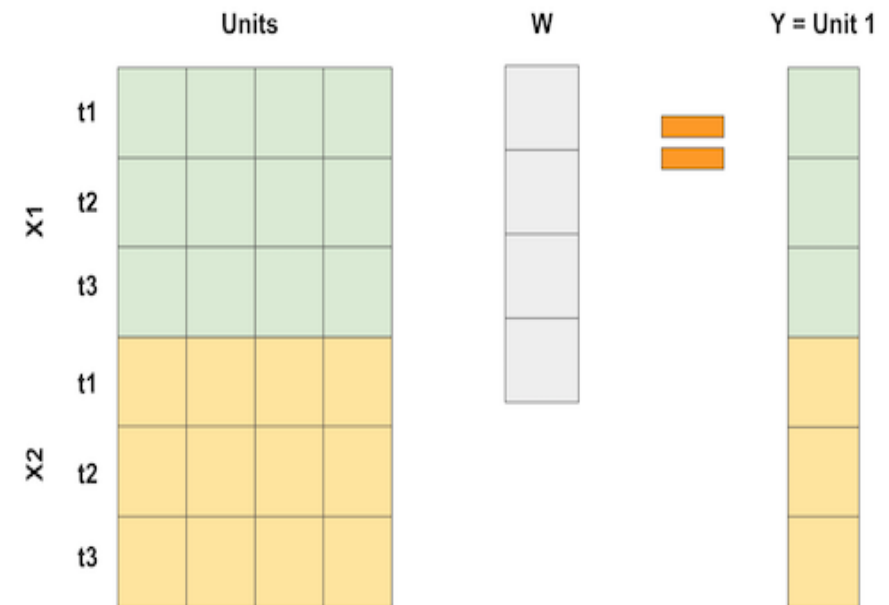
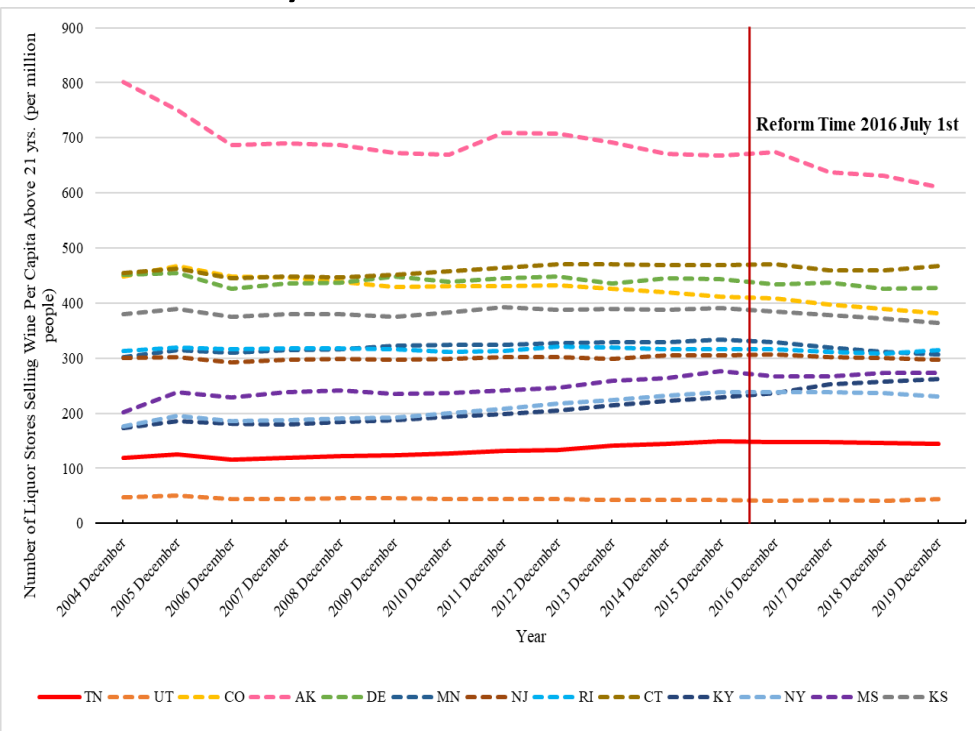
Synthetic Control Method



Data Analytics for Applied Microeconomics & Business Strategy

Causal Effect of Policy Changes : Effect of TN Liberalization of wine sale in grocery stores on liquor stores

Synthetic Control Method

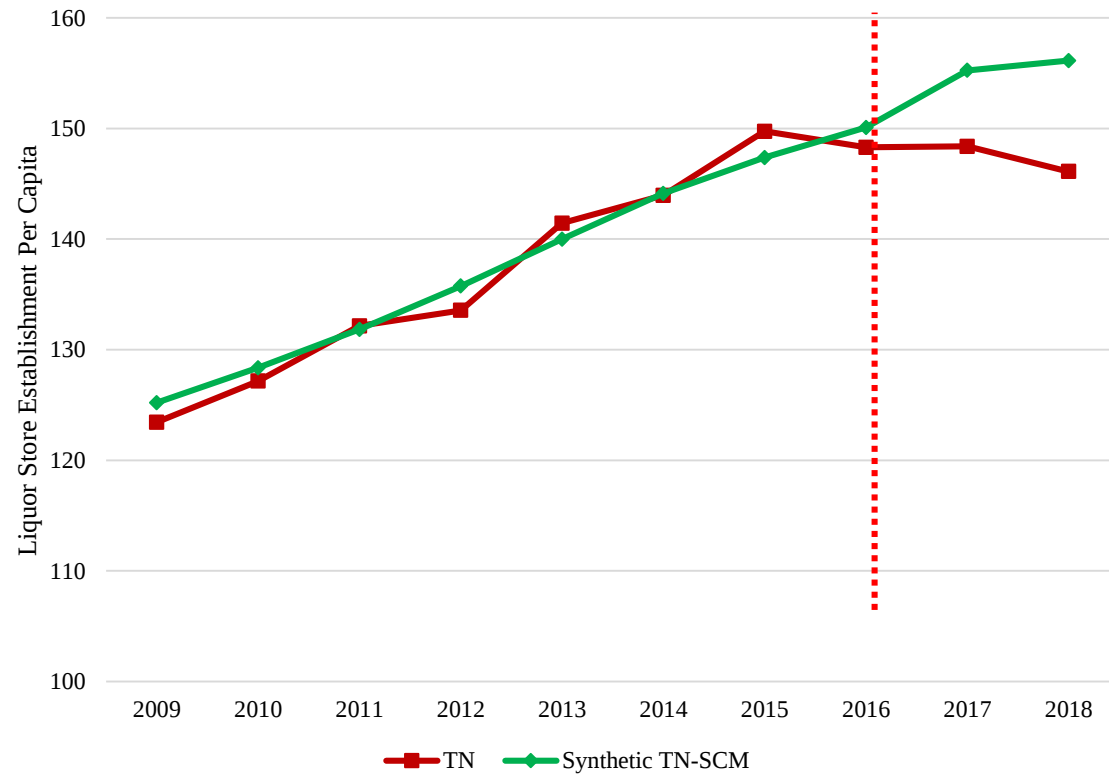


Data Analytics for Applied Microeconomics & Business Strategy

Causal Effect of Policy Changes : Effect of TN Liberalization of wine sale in grocery stores on liquor stores

Synthetic Control Method

Y = Unit 1



Data Analytics for Applied Microeconomics & Business Strategy

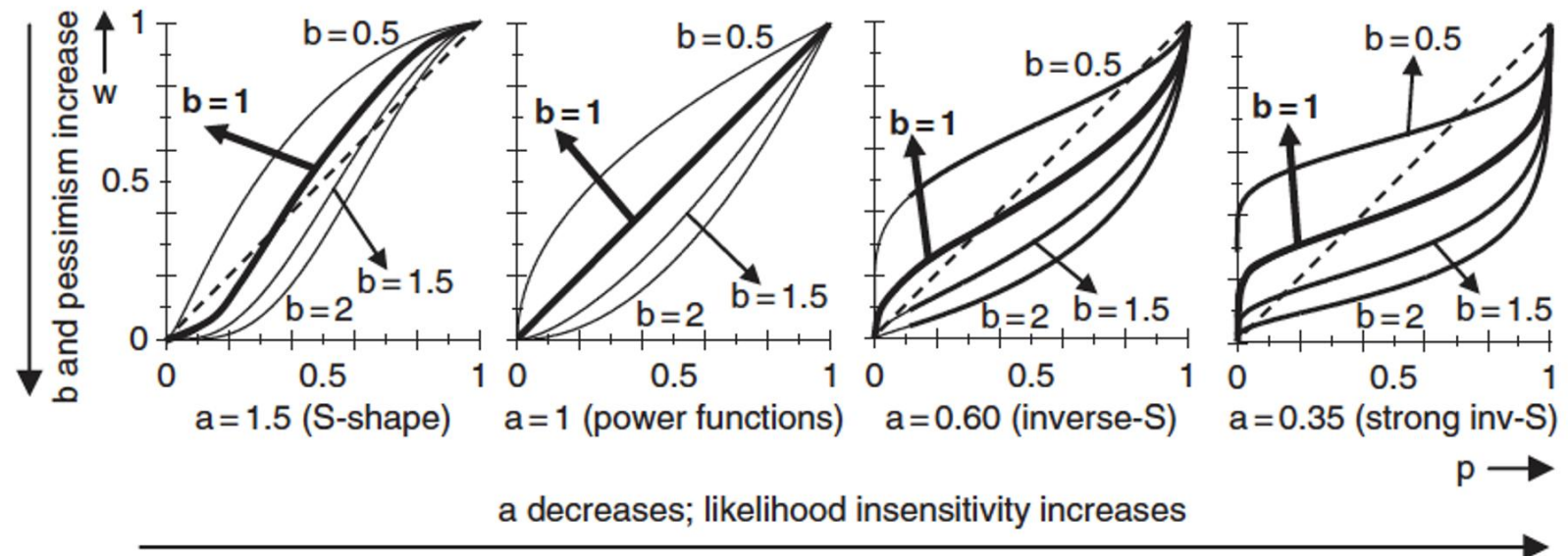
Causal Effect of Policy Changes : Effect of TN Liberalization of wine sale in grocery stores on liquor stores

Synthetic Control Method

Estimation of Structural Preference Parameters : Risk Perception in Food Safety in USA

Discrete Choice Experiment

- State-Dependent Utility
- Non-linear Probability Weight



Big Data

Big Data: 4 Vs

Volume (large data scale), Variety (different data formats), Velocity (real-time data streaming), and Veracity (data uncertainty)

Trade and Quote (TAQ), High-Frequency Data

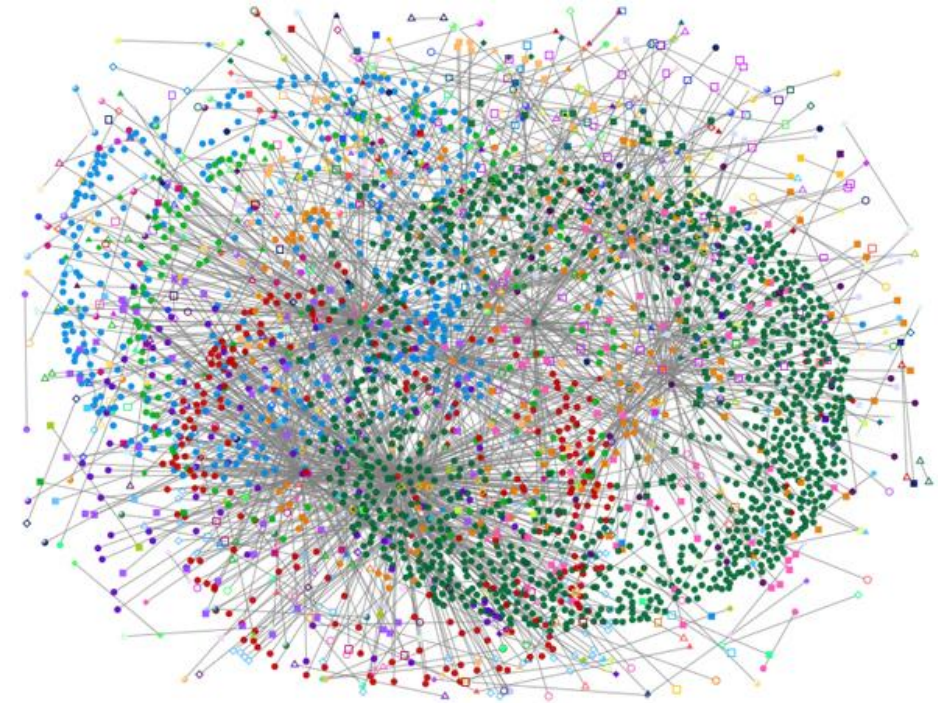
Market Microstructure, Realised Volatility, Algo Trading, etc.

Social Media

Investor Sentiment, Breaking News, etc.

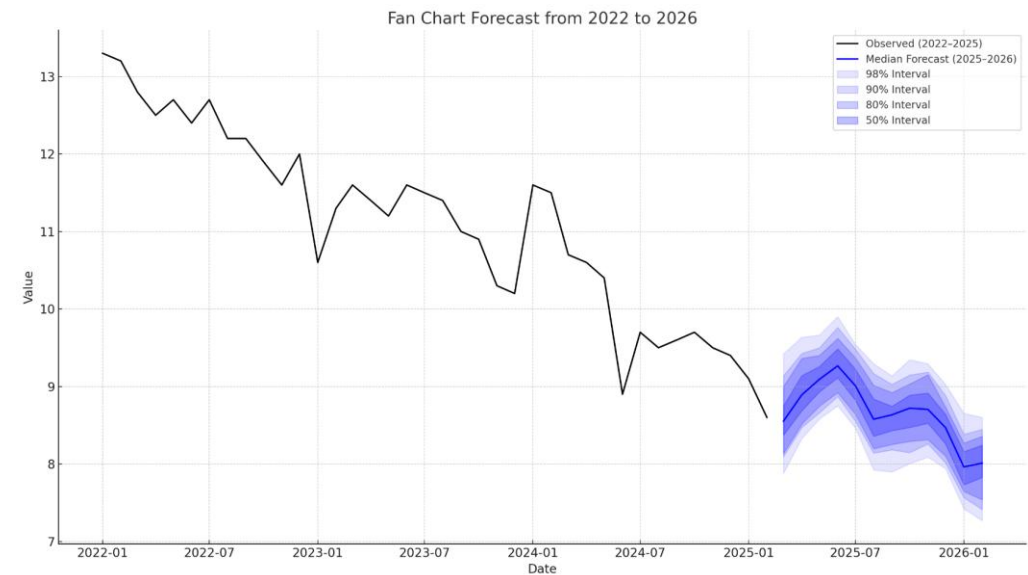
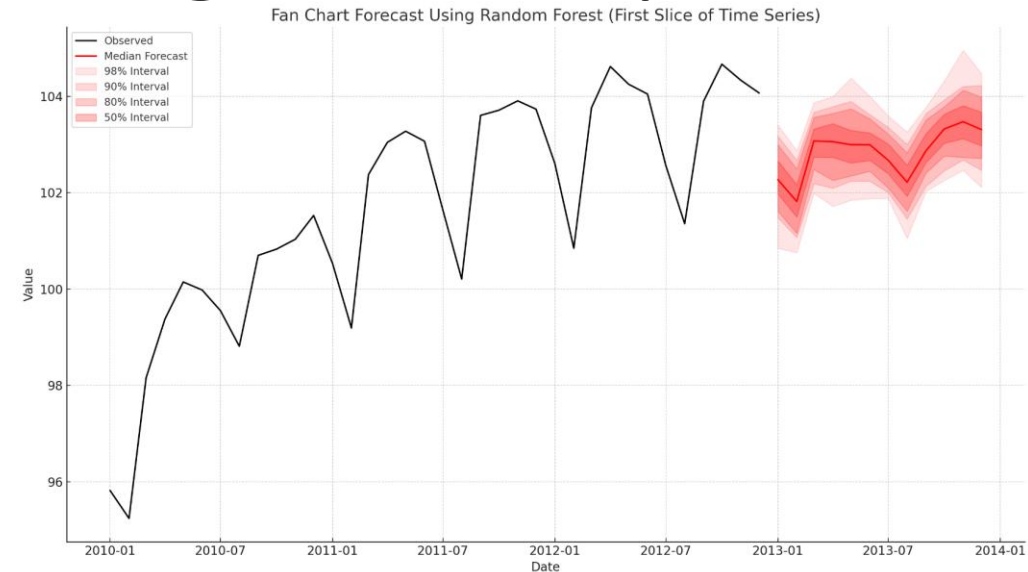
Banking & FinTech

Fraud Detection, Internet Finance, etc.



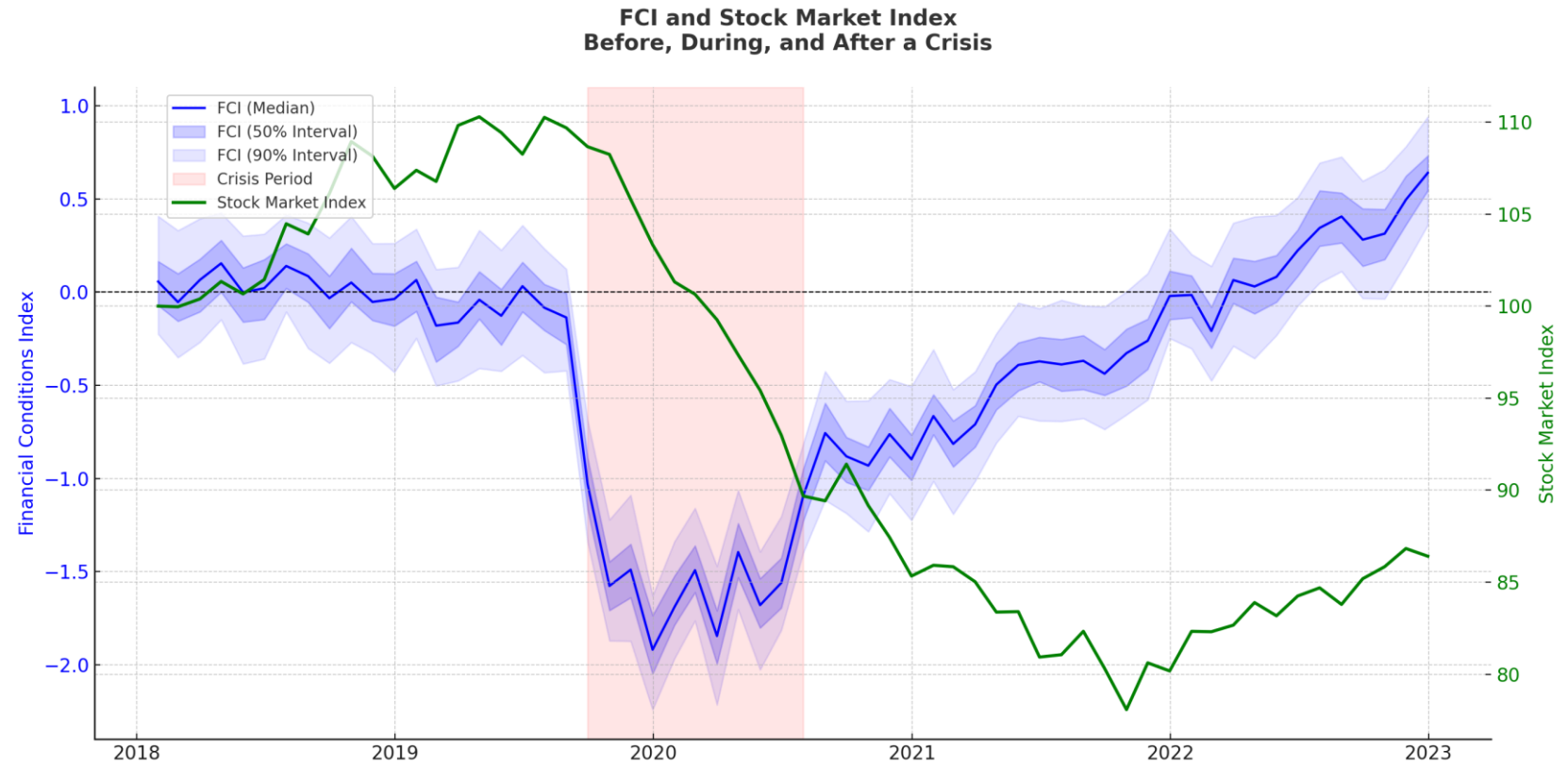
Big Data & Machine Learning for Policy

- “Timeliness”
- Macroeconomic Nowcasting & Forecasting
Inflation!
- Key Takeaways
 - Opportunities & Risks
 - Interpretability?



Big Data & Machine Learning for Policy

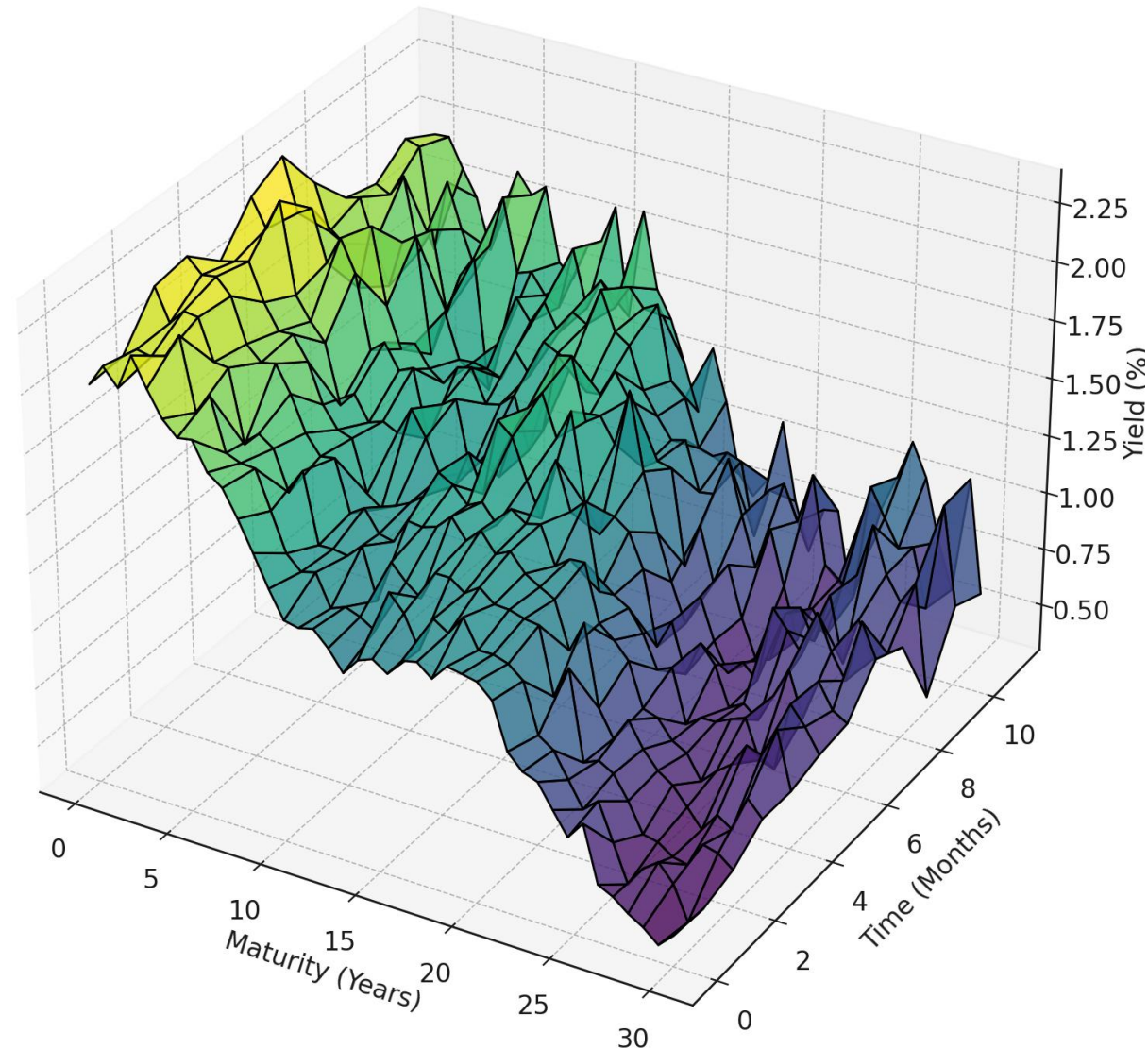
- Coincident Indicators
- Financial Conditions Indexes
- Key Takeaways
 - Opportunities & Risks
 - Interpretability?



Financial Data Analytics

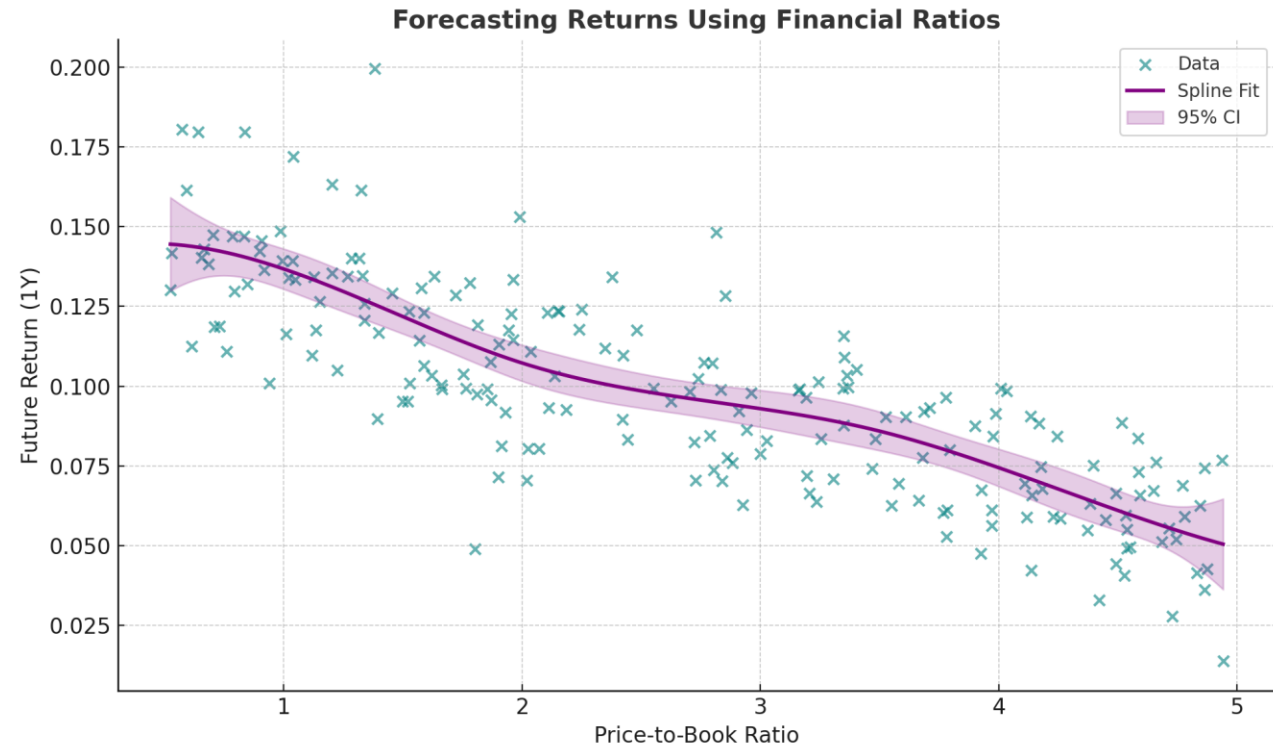
- **Why Bonds Still Matter**
- **How did central banks price risk during a pandemic?**
- **Stochastic models** (Vasicek, CIR)
- **Monte Carlo:** bond prices reaction
- **ML in Yield Curve forecasting**

3D Yield Curve Surface with Collapses



Financial Data Analytics

- Can Financial Ratios Predict the Market?
- What can accounting numbers tell us about the stock market?
- Forecast returns using financial ratios and ML
- Test whether fundamental signals actually



Financial Data Analytics

Portfolio Optimisation

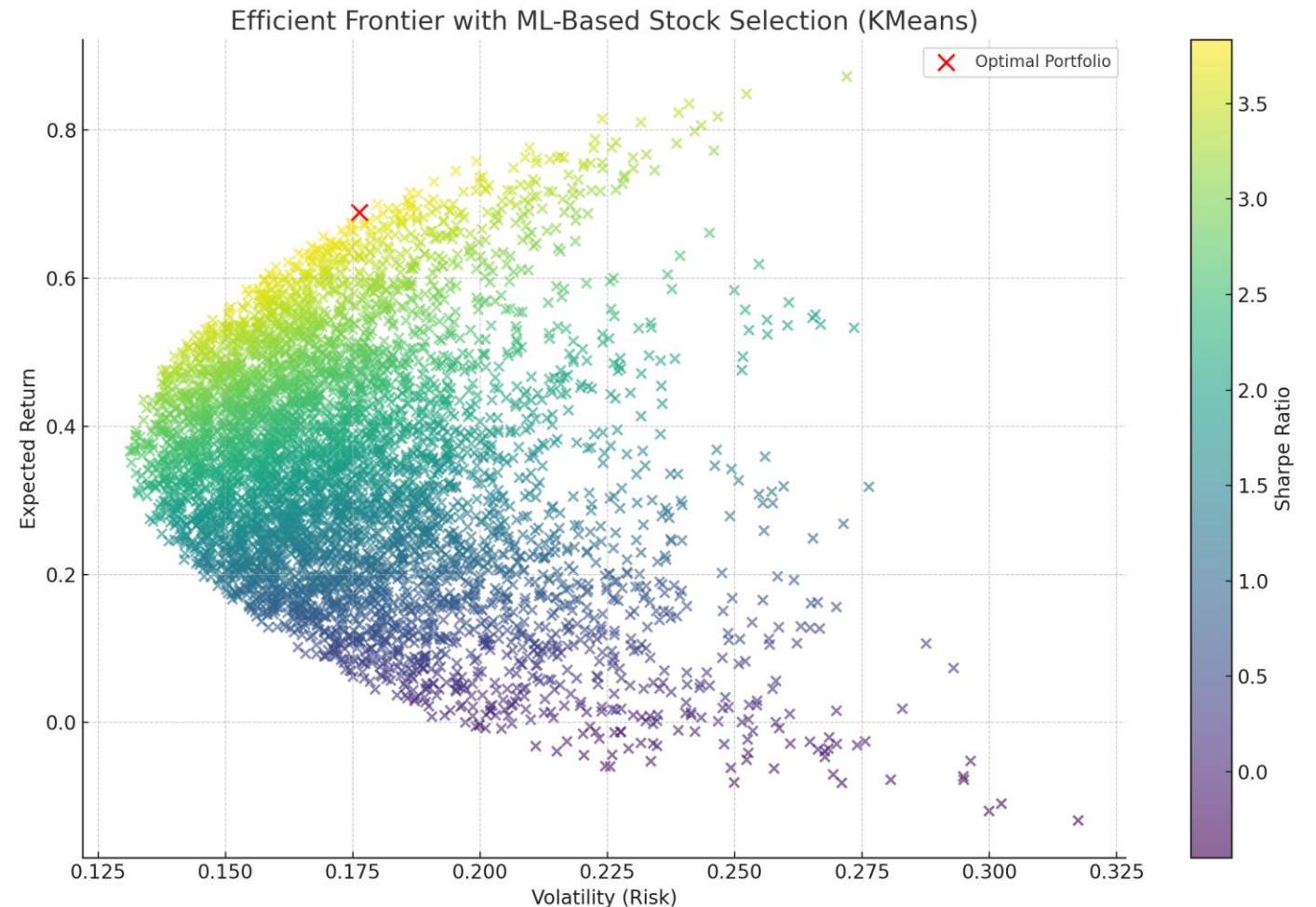
Unsupervised machine learning
(e.g., clustering)

Risk Management

Supervised machine learning
(e.g., penalised regression,
random forests, neural networks)

Algorithmic Trading

Unsupervised machine learning
(e.g., nearest neighbours)



Macroeconomics of Financial Markets (MacroFinance)

Content

1. Asset Pricing
2. Real Economy $\leftrightarrow$ Financial Markets

Tools

1. Macroeconomic Models

- i. Consumption-based Asset Pricing with Stochastic Discount Factor
- ii. Asset Pricing with Complete and Incomplete Markets
- iii. Firm Investment Decisions with Complete and Incomplete Markets

2. Numerical Simulations (examples in Matlab)

Goals

1. Bridge with PhD track (Econ, Finance, Stats)
2. Quant Career (Banking, Finance)
3. Policy Career (BoG/ECB, Policy Institutions, Regulation)

