

# 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

## Ομιλητές



**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



**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

# MSc-Master of Science Business Economics with Analytics

## Στόχος

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

- Παρέχει εκπαίδευση σε **σύγχρονες μεθόδους οικονομετρίας** και **μηχανικής μάθησης** σε γλώσσες προγραμματισμού **R & Python**
- Εφοδιάζει με **προηγμένες δεξιότητες** ανάλυσης **δεδομένα υψηλών διαστάσεων**, δομημένων ή μη, για **επίλυση σύνθετων προβλημάτων** και παροχή **καινοτόμων λύσεων** για επιχειρήσεις και αγορές.
- Απευθύνεται σε αποφοίτους ΑΕΙ στα οικονομικά, διοίκηση επιχειρήσεων, στατιστική, πολυτεχνείο, επιστήμη υπολογιστών, μαθηματικά, φυσική κ.α.

## Δομή Σπουδών 90 ECTS

### Προπαρασκευαστικά μαθήματα (1-19 Σεπ. 2025)

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

### 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

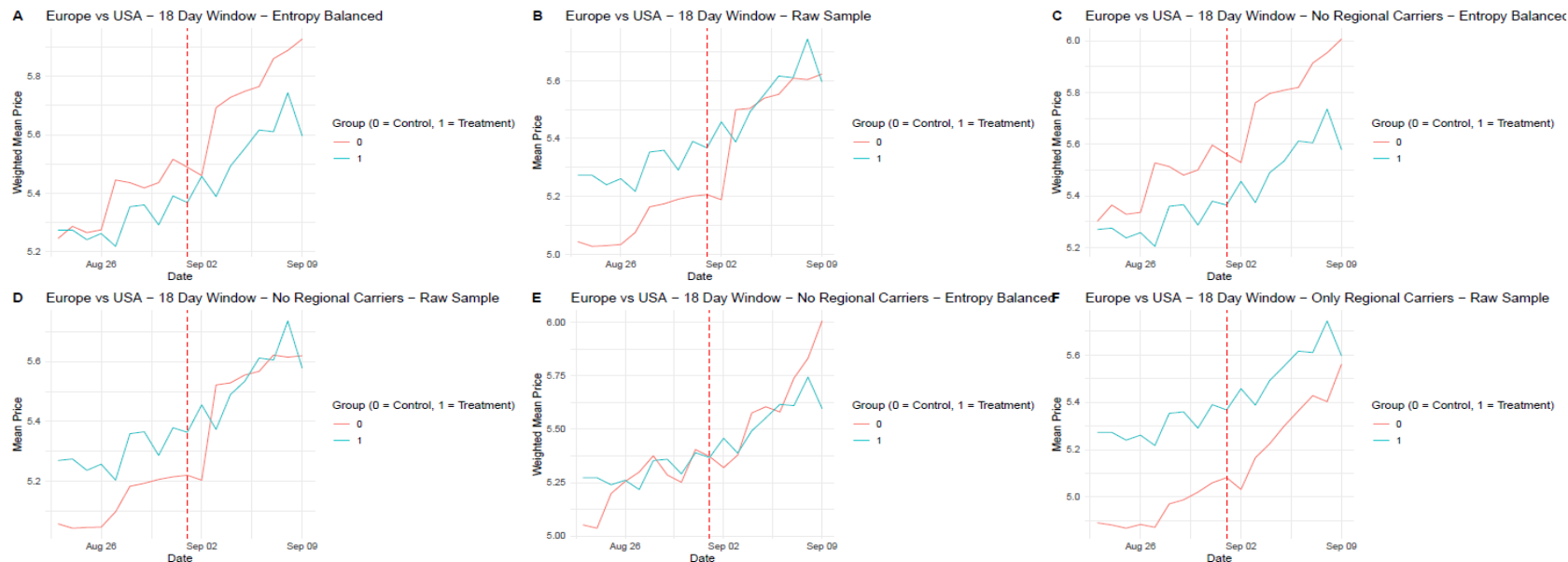
Industrial Organization and Strategy, Market Analysis and Portfolio Management, Analytical and Computational Data Methods for Economics, Quantitative Methods, Computational Econometrics for Economics and Finance, Data Analytics for Applied Macroeconomics and Finance, Behavioral Economics, Data Analytics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

### Βασικές Γλώσσες Προγραμματισμού

R, Python

# Industrial Organization (IO) & Strategy

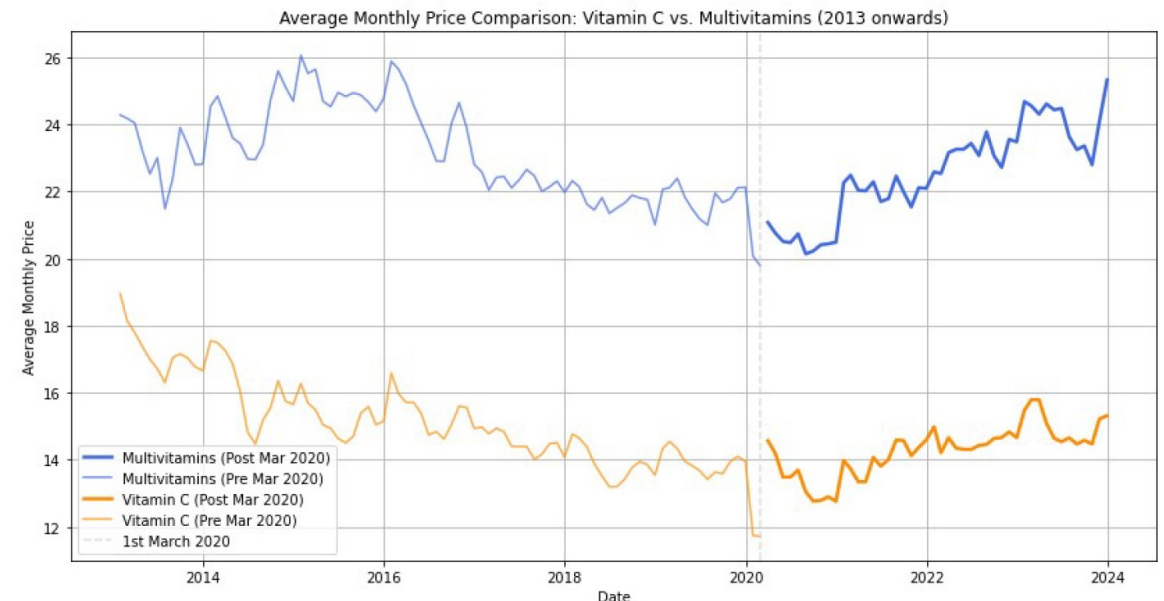
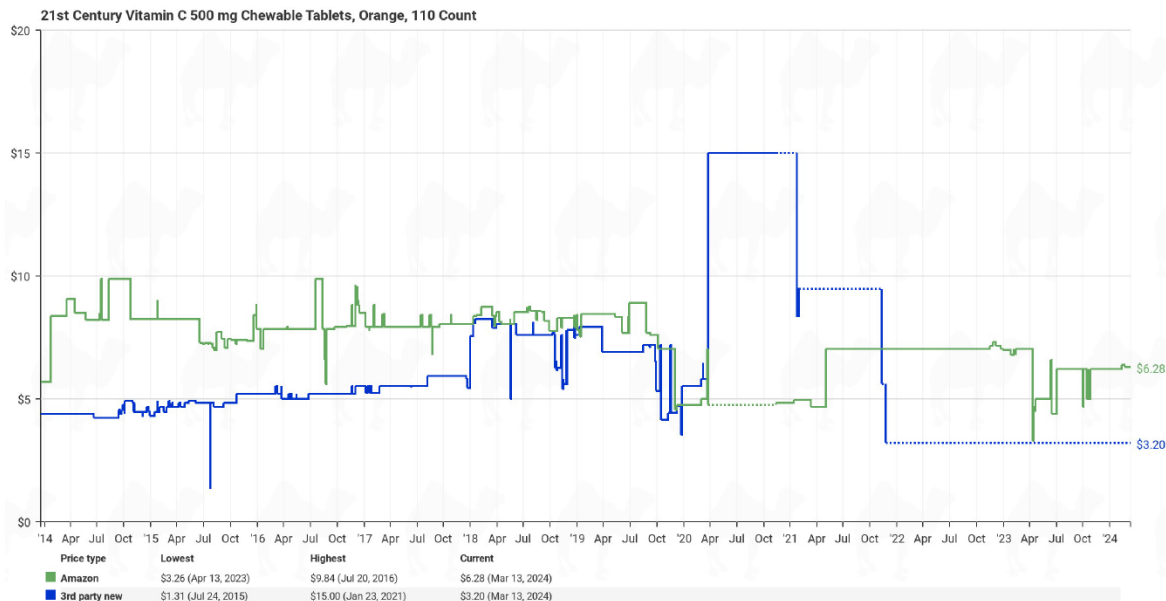
- Optimal pricing, linear and non-linear pricing (algorithmic pricing)
- Competition & collusion, cartel formation, competition policy, M&A, relative markets
- Business strategies: commitments, foreclosure, exclusion
- Industry analysis
- Behavioral IO
- Every chapter combined with tools analyzing causal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





# IO & Strategy: Tools & Achievements

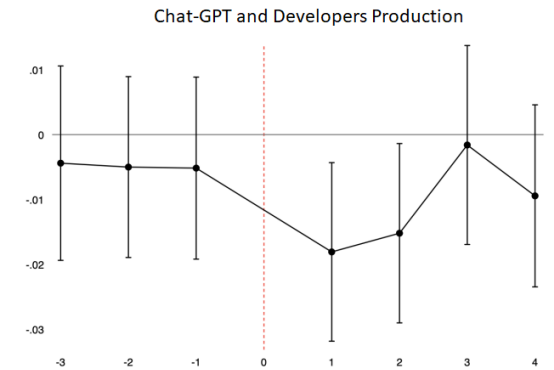
- Writing reports (white papers on competition & regulation)
- Problem solving, analytical and case studies based
- Introduction in survey design
- Run your own model: Collect, clean data & apply it to a real-world problem
- Introduction to other modules (e.g. Behavioral Economics, Analytical Methods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



# Behavioural Economics: Applications in Economics, Business and Finance

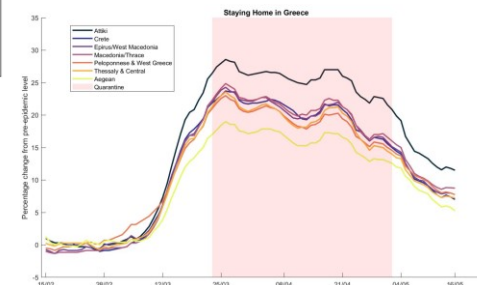
## Behavioural Microeconomics

- **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"*

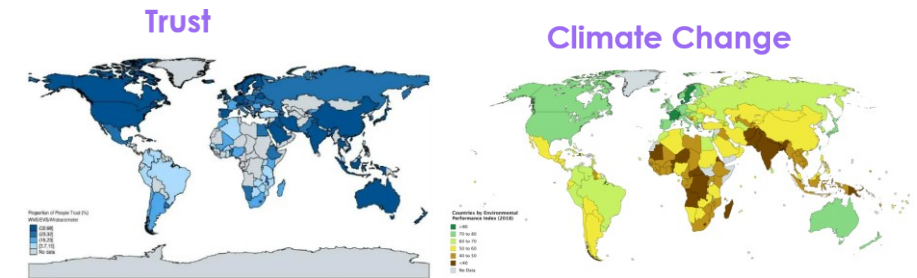


# Behavioural Economics: Tools & Achievements

- 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

IMDb

NETFLIX



# 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

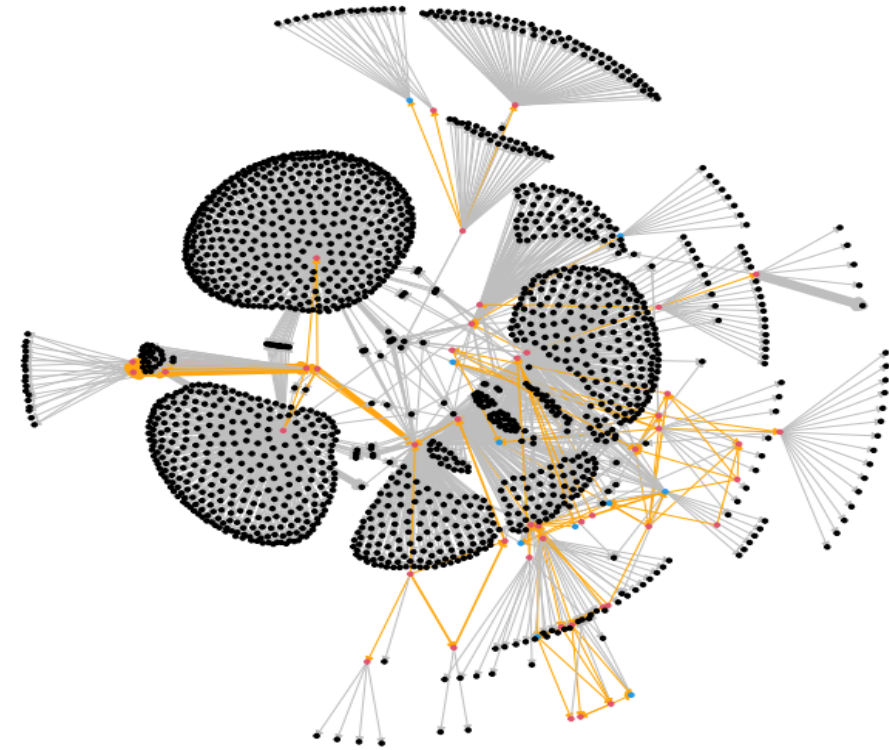
- Supervised machine learning: penalized regression, decision trees, random forests, neural networks

## 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

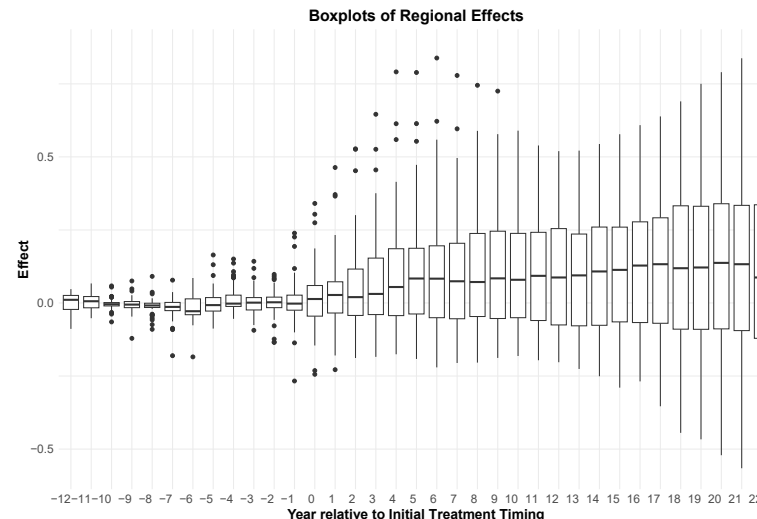
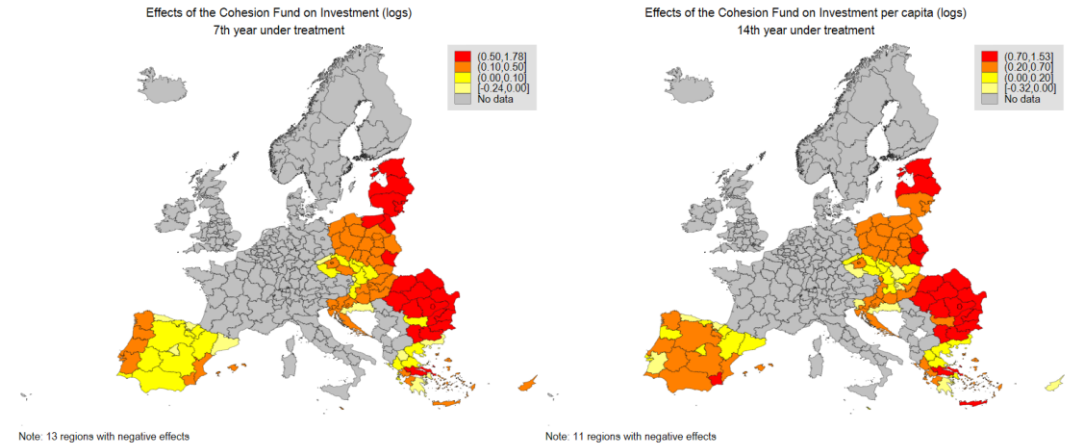
# Analytical and Computational Data Methods

- **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)

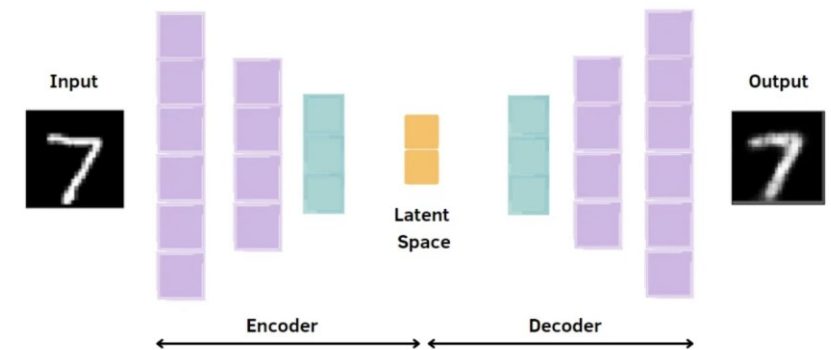
**Powerful tools for Machine Learning and Artificial Intelligence:** TensorFlow, Keras and Pytorch developed originally in Python

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

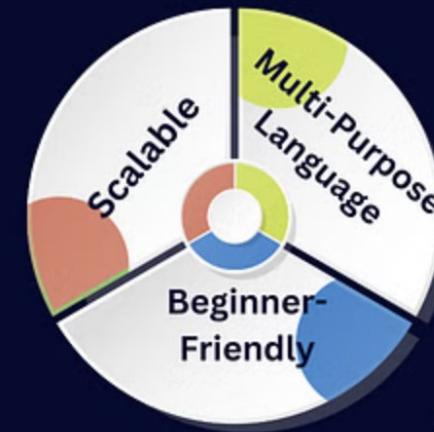
**Excellent optimization libraries**

**Increasing use** in economics and finance

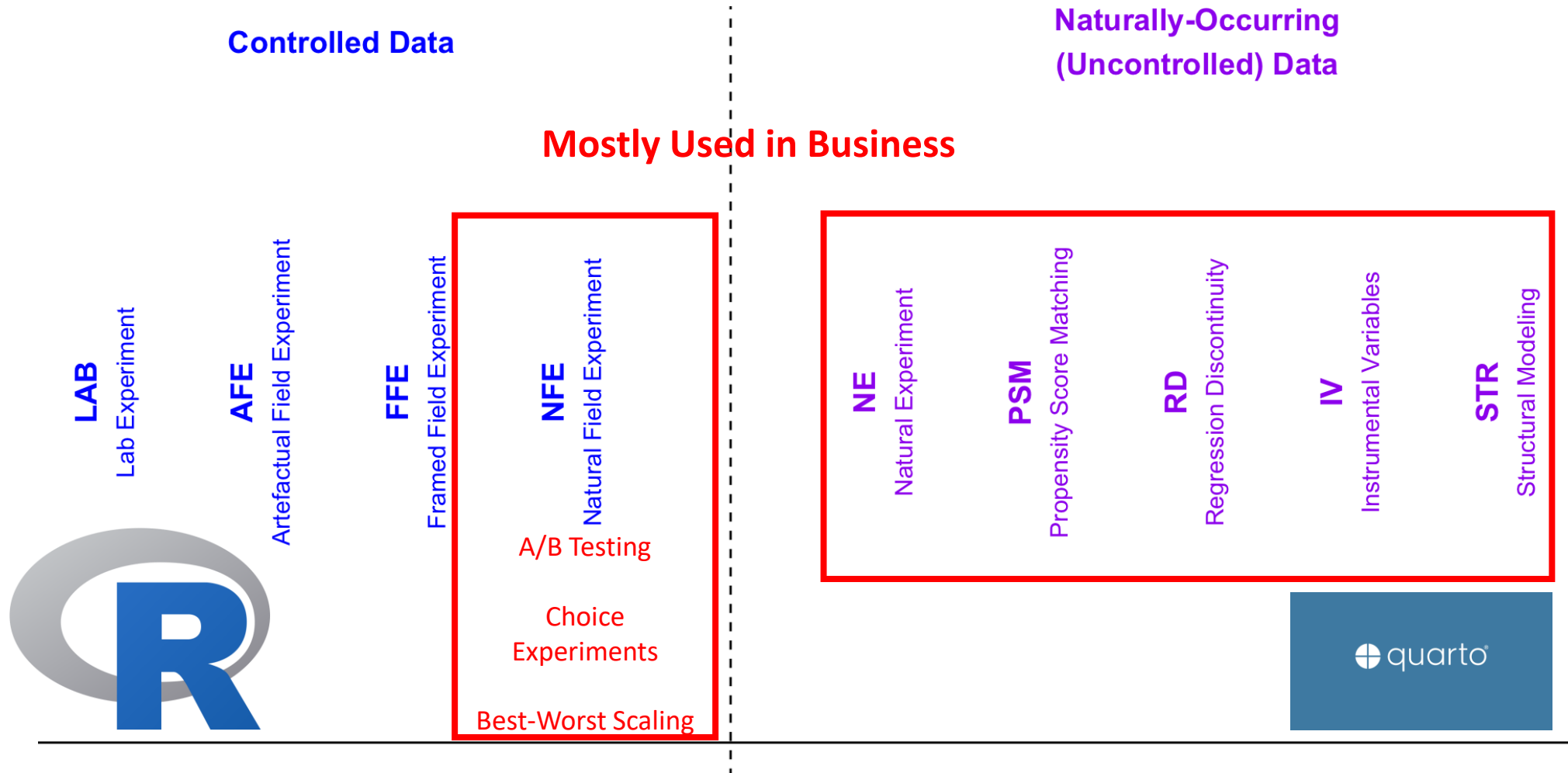
## Generative modelling through autoencoders



## Why Python for Data Science?



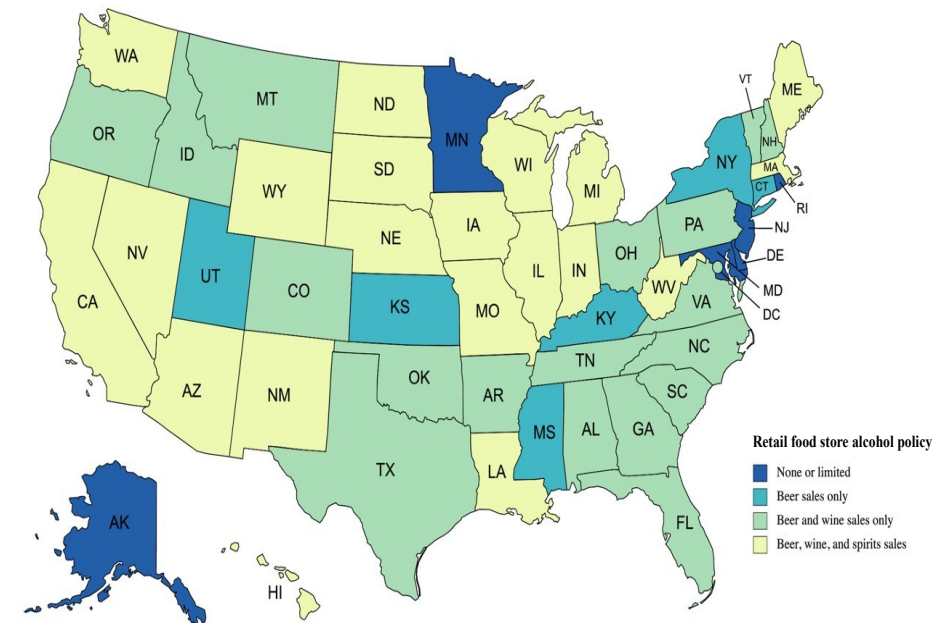
# Data Analytics for Applied Microeconomics & Business Strategy



# 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**

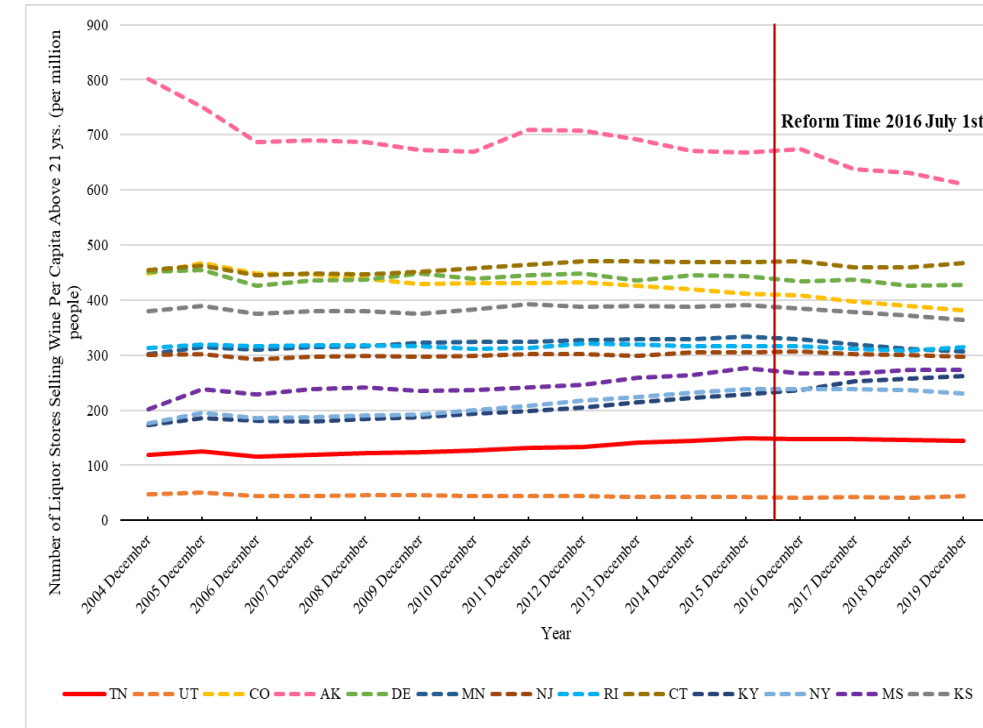
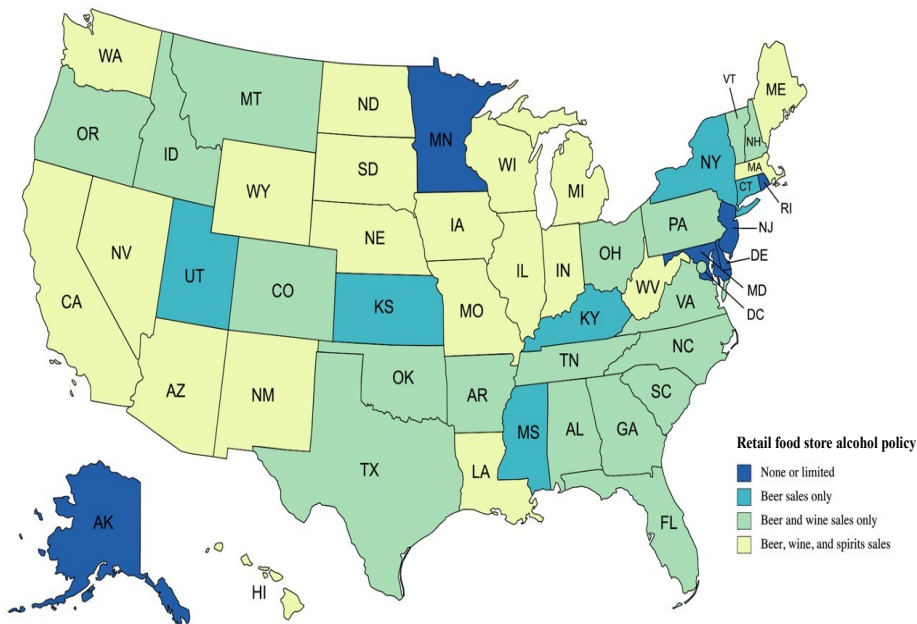
Synthetic Control Method



# 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

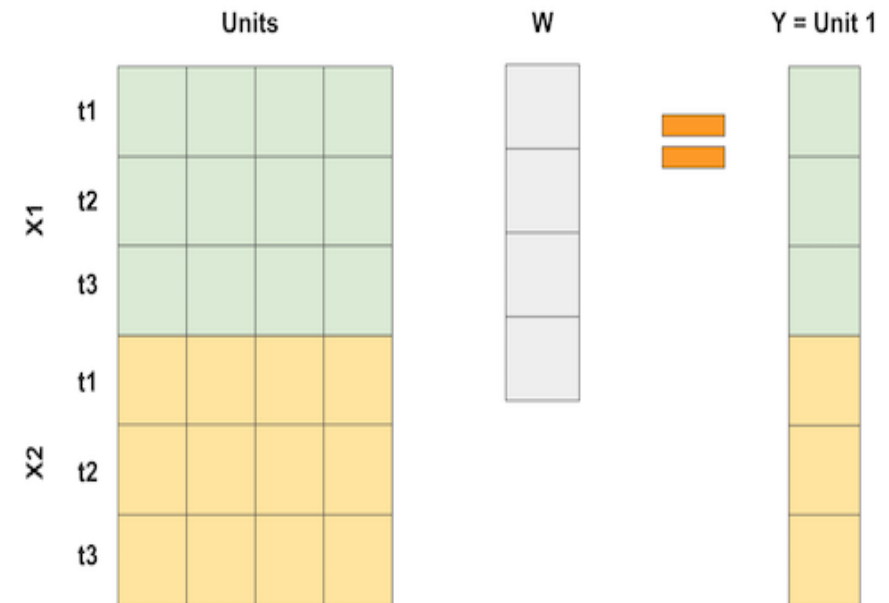
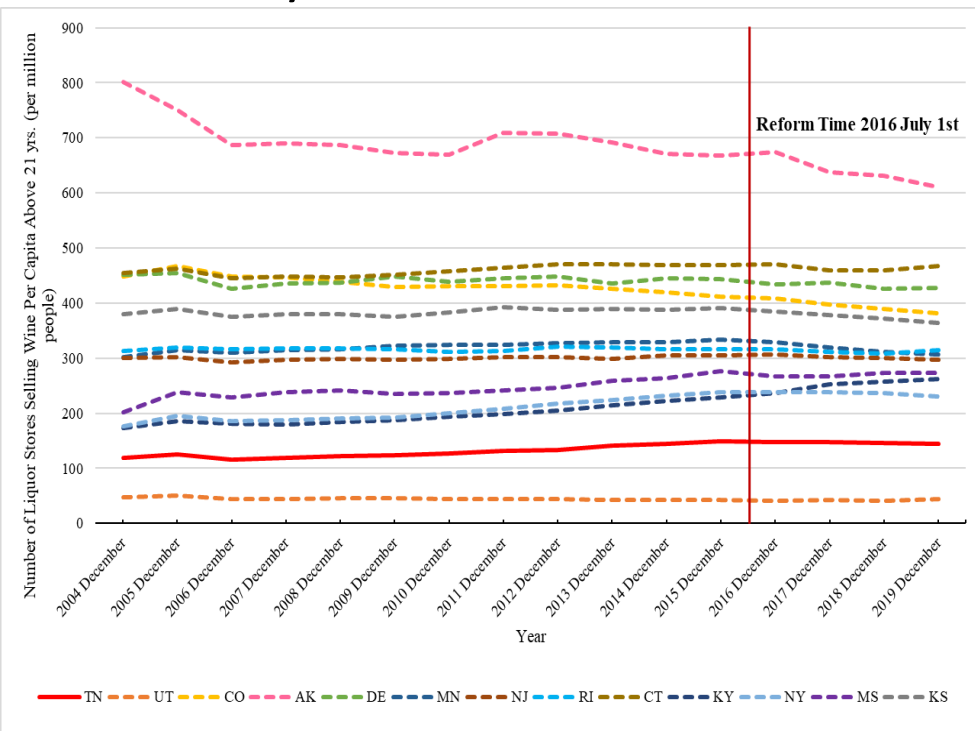




# Data Analytics for Applied Microeconomics & Business Strategy

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

Synthetic Control Method

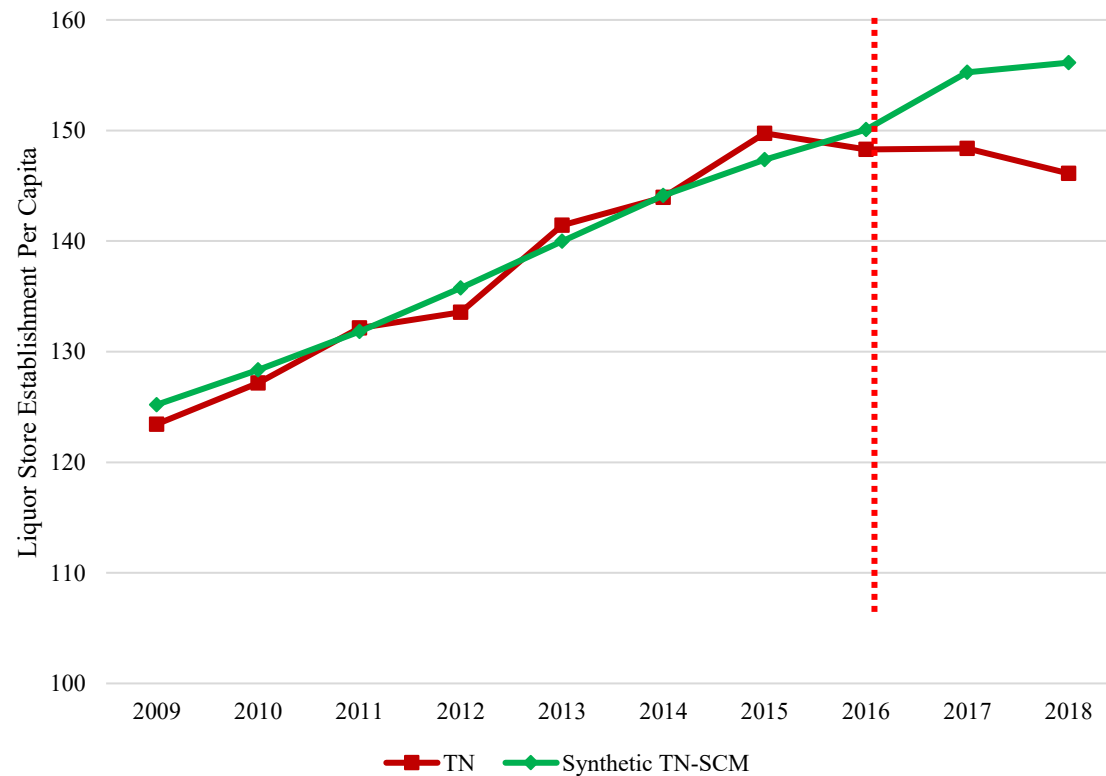


# Data Analytics for Applied Microeconomics & Business Strategy

**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

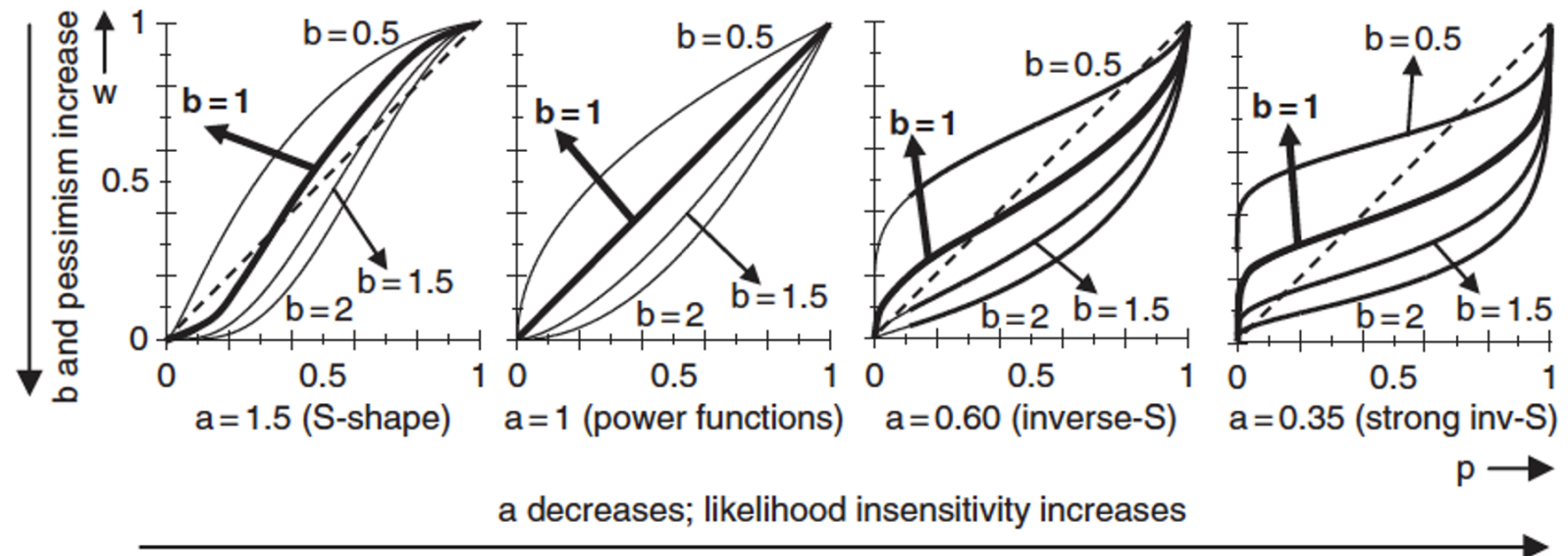
Causal Effect of Policy Changes : Effect of TN Liberalization of wine sale in grocery stores on liquor stores

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

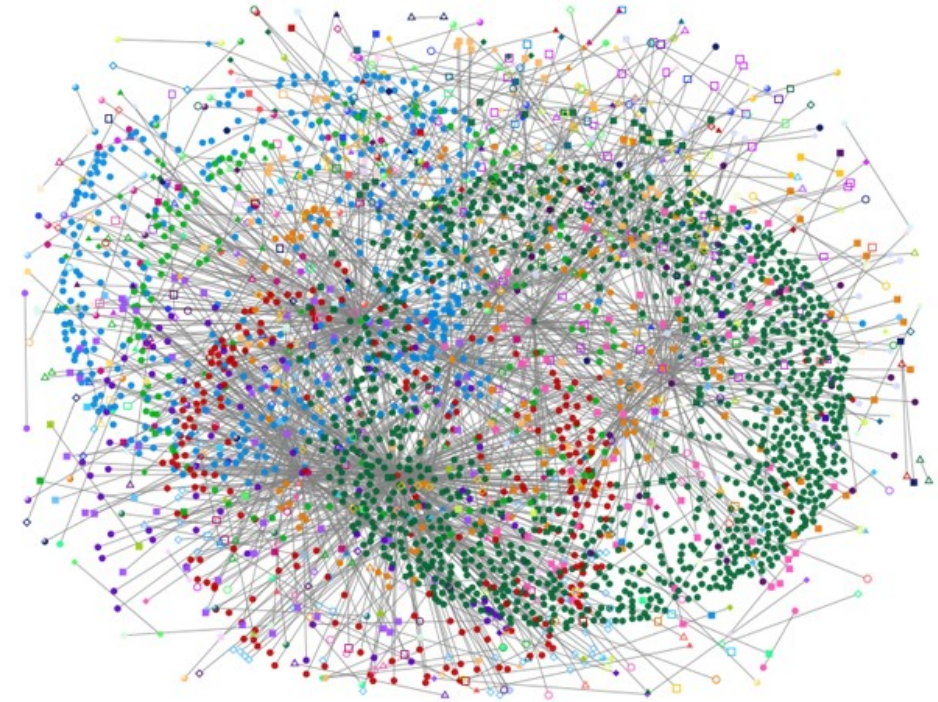
Market Microstructure, Realised Volatility, Algo Trading, etc.

## Social Media

Investor Sentiment, Breaking News, etc.

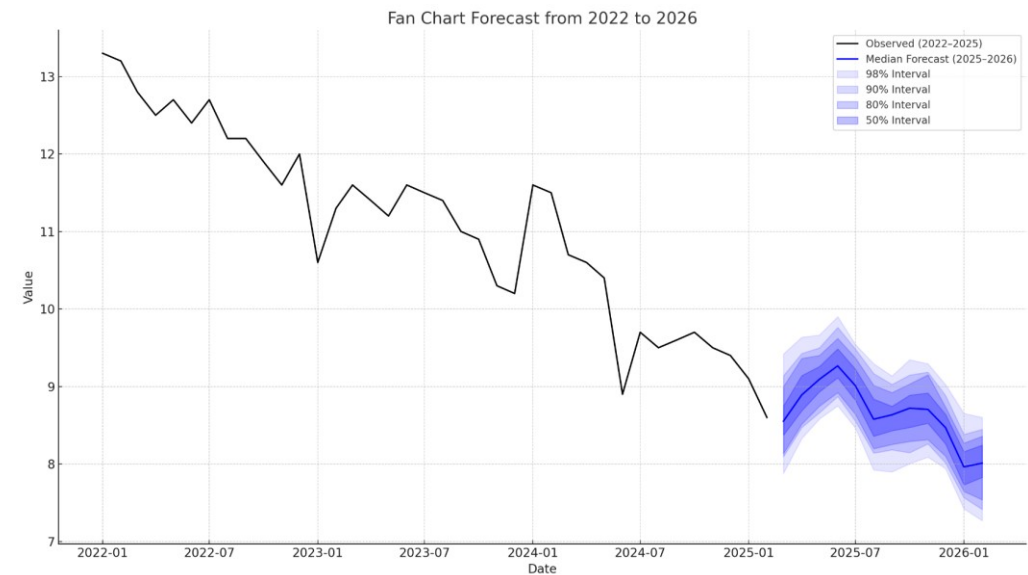
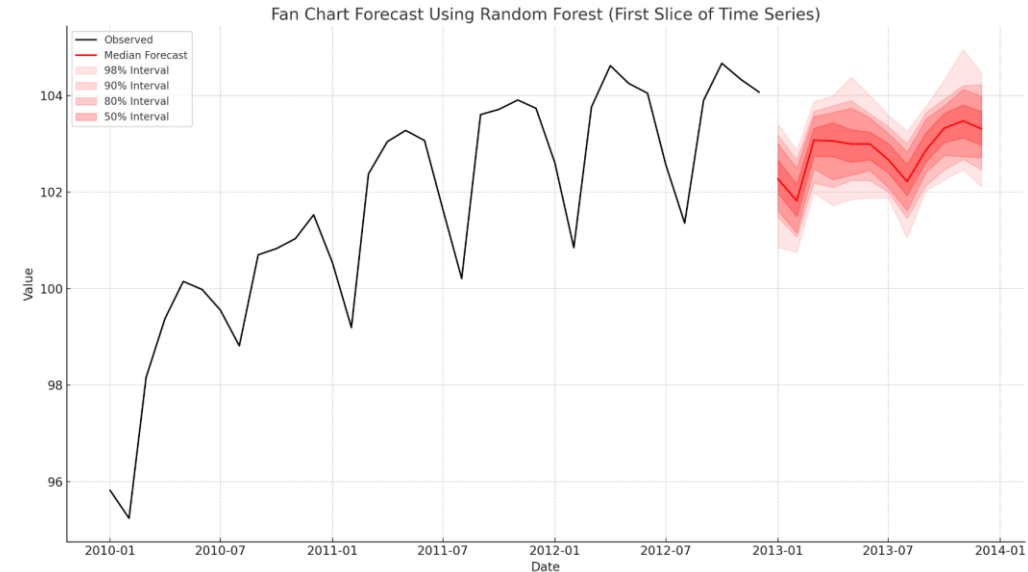
## Banking & FinTech

Fraud Detection, Internet Finance, etc.



# Big Data & Machine Learning for Policy

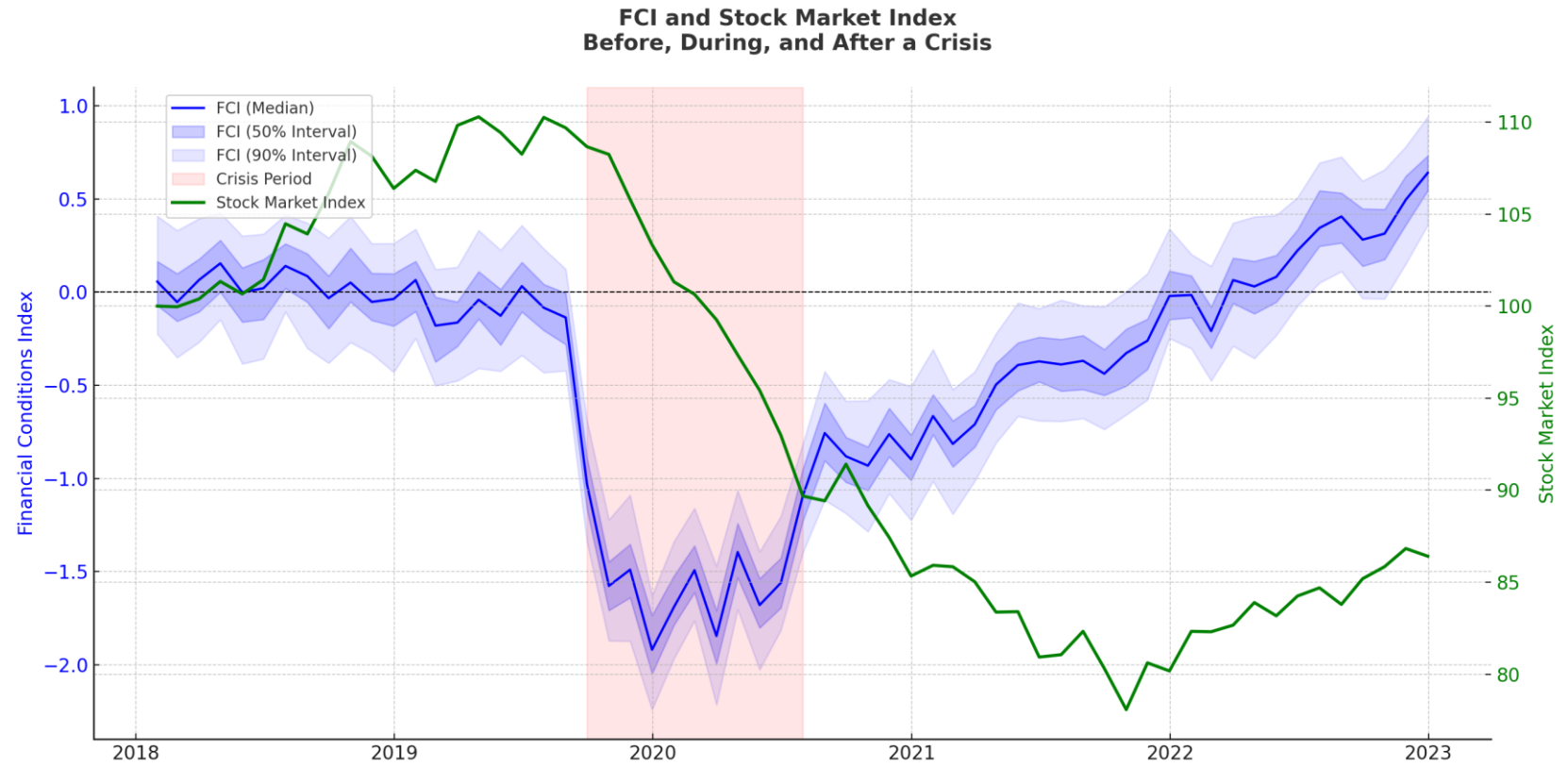
- “Timeliness”
- Macroeconomic Nowcasting & Forecasting  
Inflation!
- Key Takeaways
  - Opportunities & Risks
  - Interpretability?





# Big Data & Machine Learning for Policy

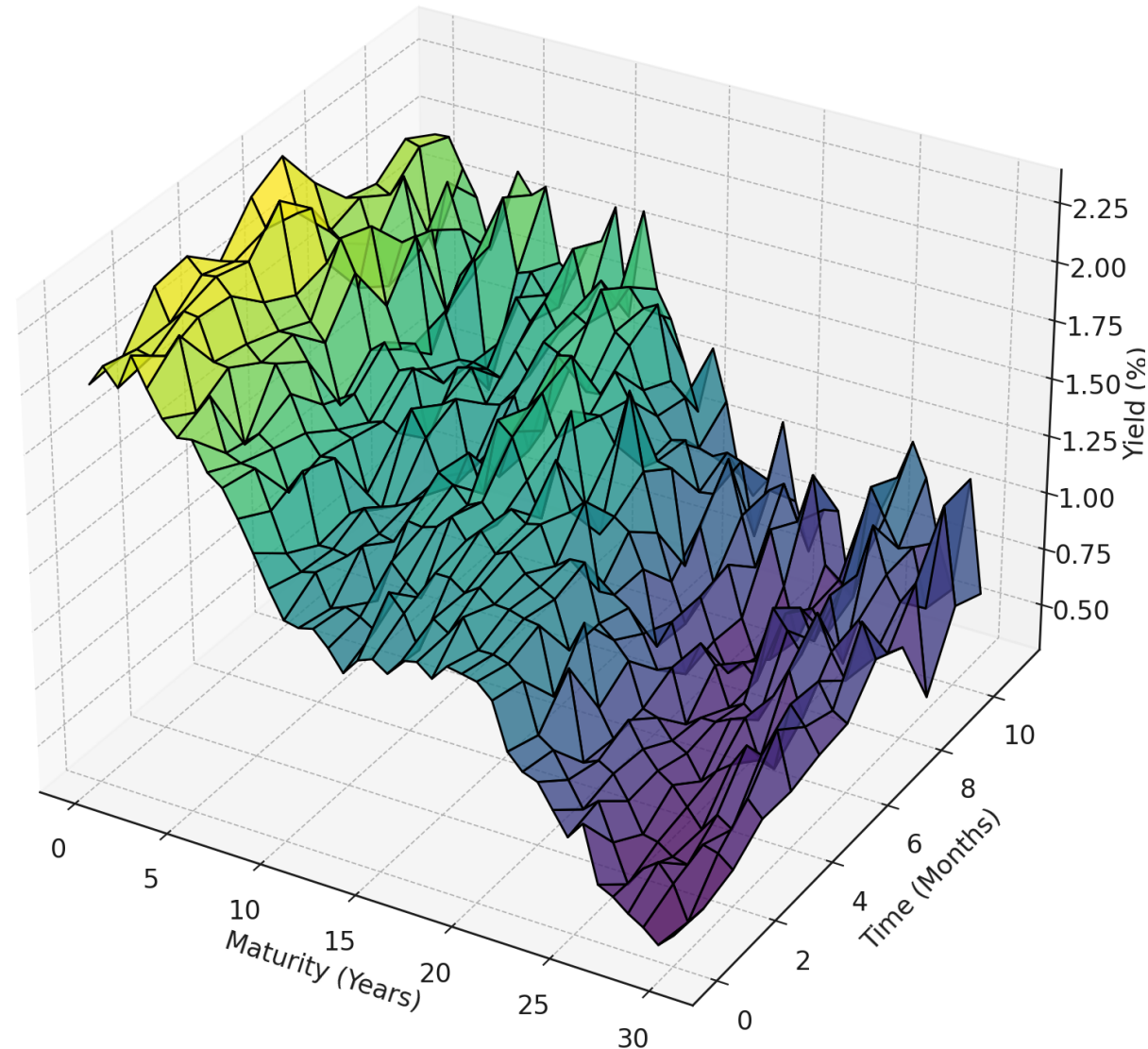
- Coincident Indicators
- Financial Conditions Indexes
- Key Takeaways
  - Opportunities & Risks
  - Interpretability?



# Financial Analytics

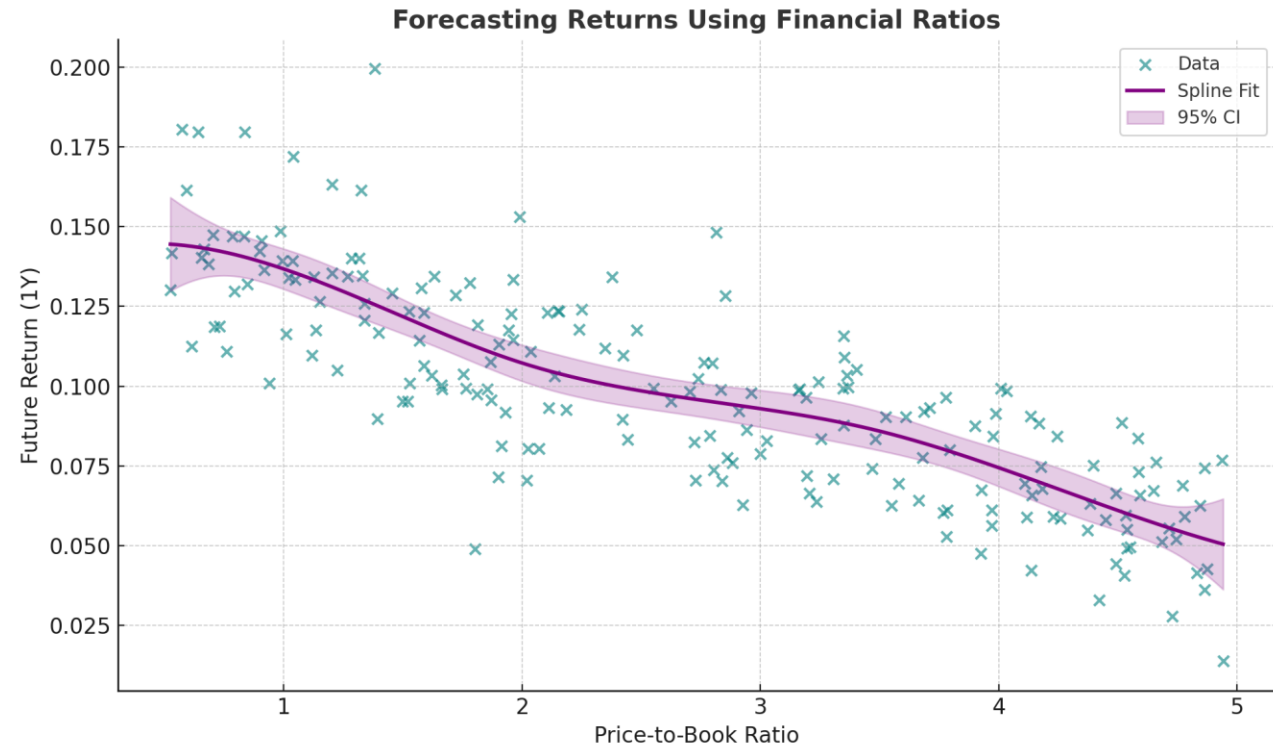
- **Why Bonds Still Matter**
- **How did central banks price risk during a pandemic?**
- **Stochastic models** (Vasicek, CIR)
- **Monte Carlo:** bond prices reaction
- **ML in Yield Curve forecasting**

3D Yield Curve Surface with Collapses



# Financial 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 Analytics

## Portfolio Optimisation

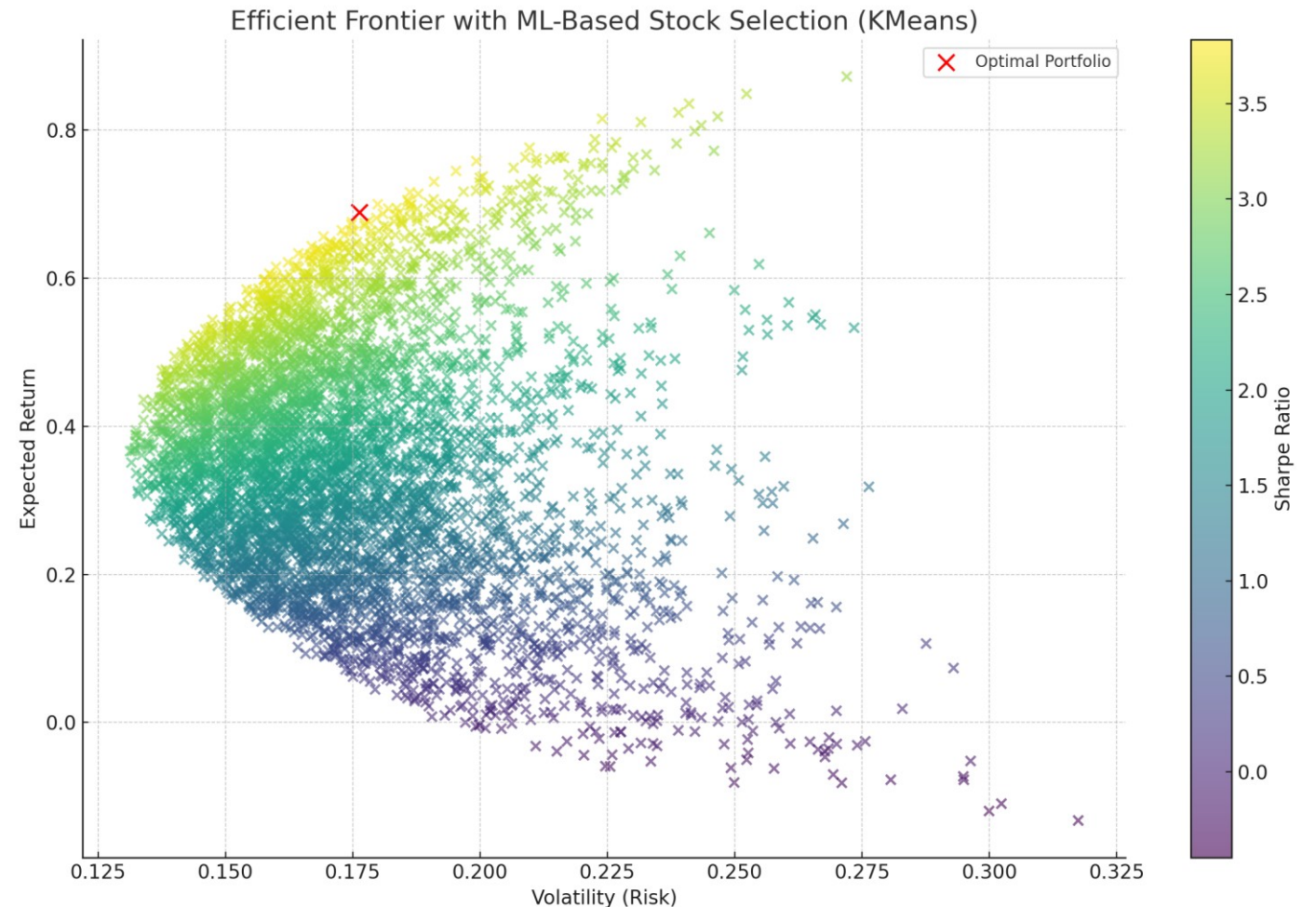
Unsupervised machine learning  
(e.g., clustering)

## 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

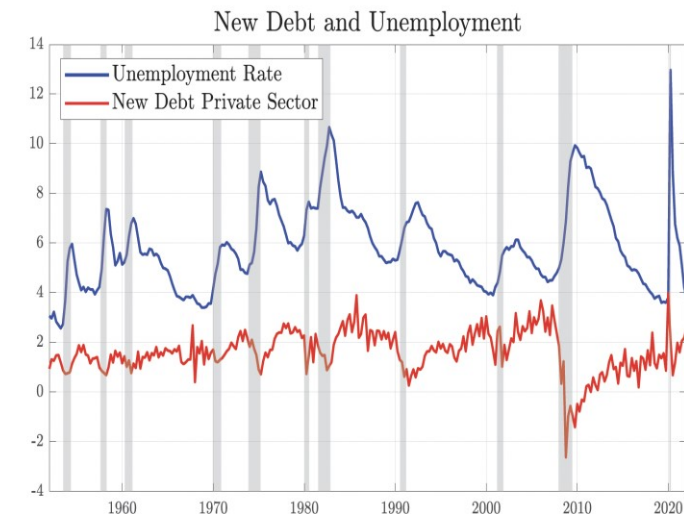
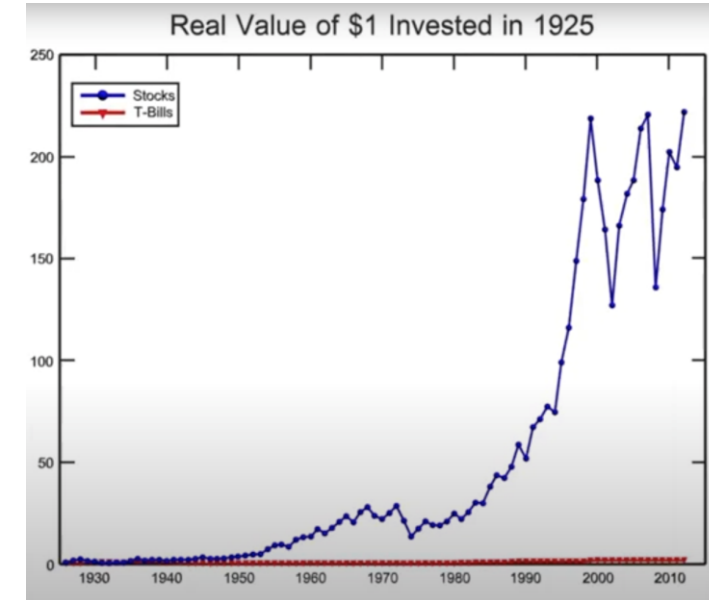
### 1. Macroeconomic Models

- 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)





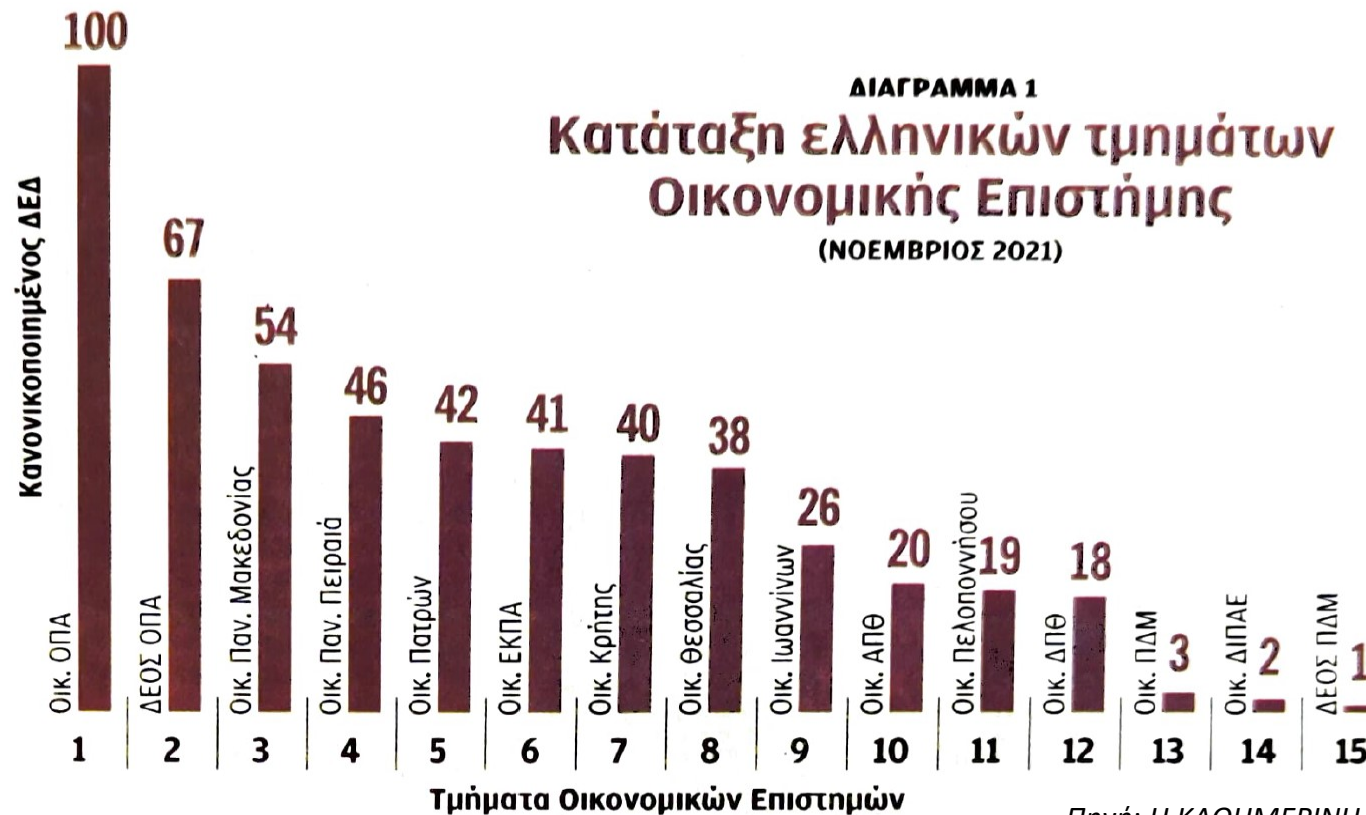
## Απεριόριστες Προοπτικές Καριέρας

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

- **ανάλυση δεδομένων 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.

# MSc-Master of Science Business Economics with Analytics

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



Πηγή: Η ΚΑΘΗΜΕΡΙΝΗ

# Strategic Partnership with the European Investment Bank (EIB) Group

**Four lectures by EIB Group personnel on the following topics:**

1. Introduction to the EIB Group - 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

## **EIB Group Lectures**

hosted by MSc in Business Economics with Analytics

9th and 16th of December 2024  
Amphitheater of Trias 2 (AUEB)



**European  
Investment Bank** | Group

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

# Thematic cooperation with **Deloitte**



On-site Workshop with **Value Creation Services (VCS)** Team in Athens,  
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.**



# MSc-Master of Science Business Economics with Analytics

ΕΛΛΑΔΑ

## Τα hot μεταπτυχιακά του Οικονομικού Πανεπιστημίου Αθηνών



Ευχαριστούμε για την προσοχή σας

[Πληροφορίες για το Πρόγραμμα](#)

[Υποβολή αίτηση](#)