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

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Περιεχόμενα

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

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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

✅ **Θα είναι το Μεταπτυχιακό μου επίκαιρο σε 10+ χρόνια;**
📈 Είναι *προσαρμοσμένο στις αλλαγές της αγοράς και της τεχνολογίας;*

✅ **Προσφέρει το Μεταπτυχιακό μου ισχυρές προοπτικές καριέρας;**
🚀 *Σε συνδέει άμεσα με την αγορά εργασίας;*

✅ **Μου δίνει το Μεταπτυχιακό μου εφόδια να ανακαλύψω τι πραγματικά με εμπνέει;**
🔍 *Με βοηθά να καταλάβω τι θέλω να κάνω επαγγελματικά;*

Με την αξιοπιστία του Τμήματος Οικονομικής Επιστήμης του ΟΠΑ

Διαχρονικά κορυφαίου τμήματος οικονομικών επιστημών στην Ελλάδα

Πηγή: *Η ΚΑΘΗΜΕΡΙΝΗ*

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 **δεδομένων 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.

Στόχος του Προγράμματος, πιο αναλυτικά:

Το πρόγραμμα παρέχει ισχυρό υπόβαθρο στα **εφαρμοσμένα οικονομικά** και **χρηματοοικονομικά**, όπου με χρήση σύγχρονων **οικονομετρικών μεθόδων** σε R, Python, machine learning οι απόφοιτοι εντοπίζουν και ερμηνεύουν μοτίβα σε πλήθος αγορών, αποκτώντας **ανταγωνιστικό πλεονέκτημα** για **ταχεία**, **ακριβή**, και **τεκμηριωμένη** λήψη αποφάσεων.

Το **ανταγωνιστικό πλεονέκτημα** που προσφέρει το πρόγραμμα στις/ους αποφοίτους του την εποχή της Τεχνητής Νοημοσύνης βασίζεται σε τρεις κρίσιμες δεξιότητες:

- ✓ την ικανότητα **αξιολόγησης** των αποτελεσμάτων εργαλείων AI: έλεγχο φοράς/προσήμων στο πλαίσιο αυτοματοποιημένης λήψης αποφάσεων, αναγνώριση/ταυτοποίηση αιτιοκρατικών σχέσεων,
- ✓ την ικανότητα διατύπωσης **ορθών οικονομικών ερωτημάτων** προς διερεύνηση, λαμβάνοντας υπόψη τη δομή αγοράς, τα κίνητρα και τις στρατηγικές αλληλεπιδράσεις,
- ✓ την ικανότητα **εντοπισμού σφαλμάτων** στα αποτελέσματα εργαλείων AI, όπως λανθασμένες προδιαγραφές, ενδογένεια και σύγχυση μεταξύ συσχέτισης με αιτιότητας.

Εύρος Δεξιοτήτων: Ενδεικτικές θεματικές διπλωματικών εργασιών, ακαδημαϊκού έτους 2025–2026

💰 Χρηματοοικονομικά & Διαχείριση Κινδύνου Αγοράς

- Applied econometrics for high-frequency trading with machine learning
- Portfolio optimization with big data

📊 Συστήματα Ελέγχου & Διαχείριση Λειτουργικών Κινδύνων

- AML and fraud detection with machine learning
- Detection of tax evasion with machine learning

🌍 Περιβάλλον & Κλιματική Αλλαγή

- Climate change and economic impact
- Green investments appraisal

🏛️ Δημόσια Πολιτική & Μακροοικονομία

- Labour markets, automation and AI
- Sentiment in central bank speeches and press releases

⚽ Οικονομικά του Αθλητισμού

- Advanced sports analytics

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Δομή Σπουδών
90 ECTS

Προπαρασκευαστικά μαθήματα (1-19 Σεπ. 2026)

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

Πρόγραμμα διδασκαλίας και διπλωματική

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

Machine learning

Strategic Partnership with the European Investment Bank Group

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

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

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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

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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

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Delegations to Econometric Game

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

Our very own **Vasileia Argyrou**, **George Skolarikis** from **MSc in Business Economics with Analytics** and Ph.D. students **George Malanos (team leader)** and **Christina Logotheti** represented **Greece** at the **Econometric Game 2026** 🌍

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

📊 Multivariate electricity price forecasting
Integrated complex, high-frequency data: *weather, renewables, cross-border flows*

🧠 **Methodological Approach**

Core Model: HAR / UMIDAS (mixed-frequency data)
Prediction: Tree-based ML + Recursive Feature Elimination
Explainability: SHAP values for policy insights
Advanced Forecasting: STL decomposition + harmonic regressions, seasonal naïve & random walk models

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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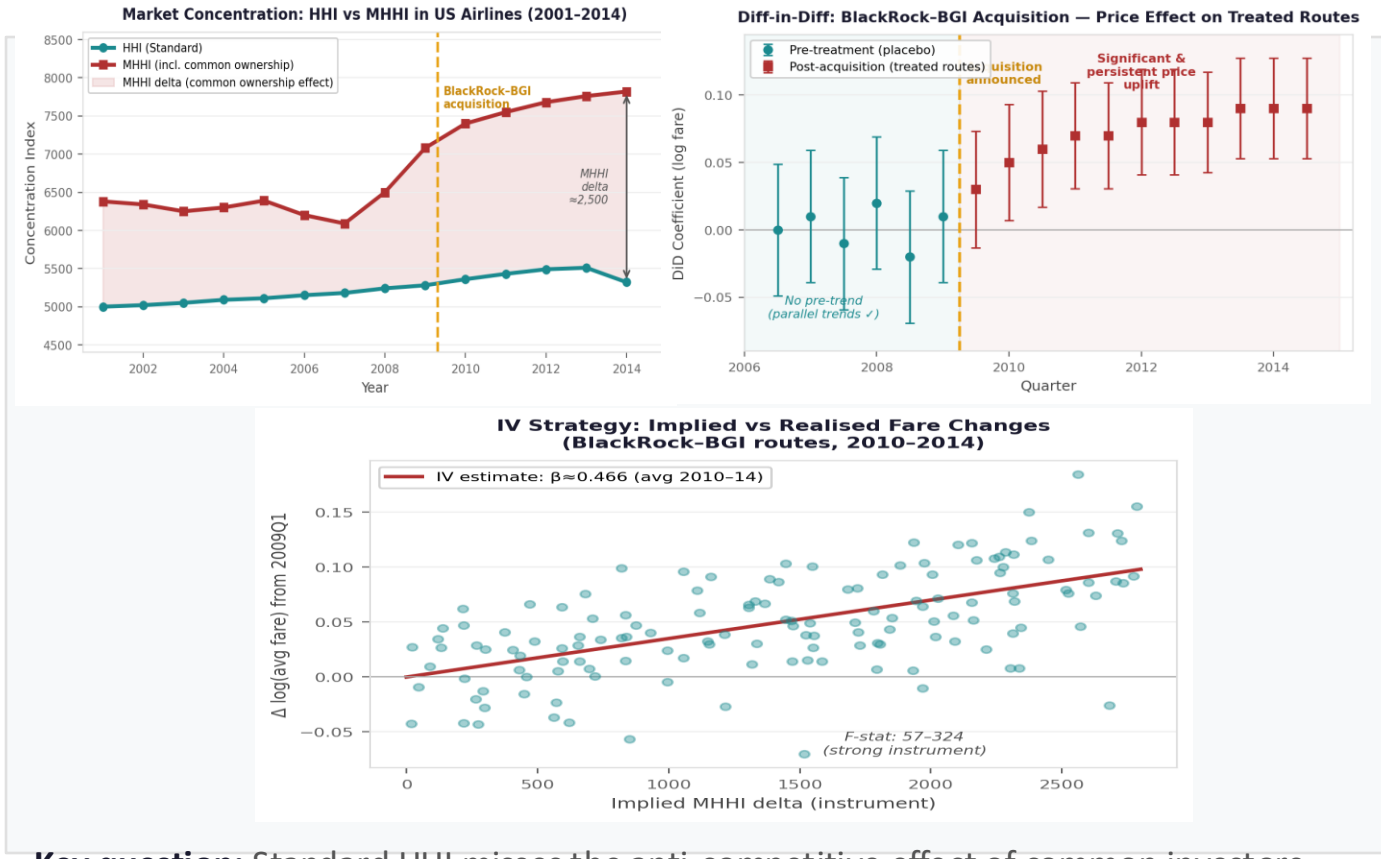
Industrial Organization (IO) & Strategy — Course Focus

Course topics

- **Optimal & algorithmic pricing** — linear, non-linear, dynamic
- **Market power & competition** — HHI, MHHI, concentration measures
- **Common ownership & collusion** — institutional investors, cartel detection
- **M&A**— Horizontal, vertical, market definition, digital markets
- **Business strategies** — commitments, foreclosure
- **Information economics**— Adverse selection, moral hazard
- **Behavioral IO** — bounded rationality, platform economics

Every topic combined with causal tools

From theory to data — a course example



Key question: Standard HHI misses the anti-competitive effect of common investors — MHHI delta was **10× the DOJ anticompetitive threshold** in US airlines by 2014.

DiD ***IV*** ***OLS / FE*** ***RDD***

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IO & Strategy — Skills & Your Comparative Advantage

What you master

Rigorous economic theory

Game theory · Market design · Contract theory · Information economics · Strategic interaction — **the analytical backbone AI cannot replicate**

Skills you build

- **Collect & structure real data**
- **Run & interpret causal models**
- **Diagnose market structure**
- **Write competition & policy briefs**

Your edge in the AI era

01 — Spot AI errors

AI tools misspecify models, ignore endogeneity and confuse correlation with causation. IO training lets you catch it.

02 — Validate outputs

IO gives you the economic intuition to check signs, magnitudes and identification before any decision.

03 — Frame the question right

AI needs the right question. Market structure, incentives, strategic interaction — that is what you bring.

IO & Strategy — How We Build the Course: A Student Essay Example

From real data to IO insight — self-tanning market analysis (St. Tropez vs L'Oréal, 2016–2025)

Step 01: Collect & structure data

SKU-level sales (Amazon/3rd party) merged with Google Trends US search intent for 'Self tan' — building a panel dataset

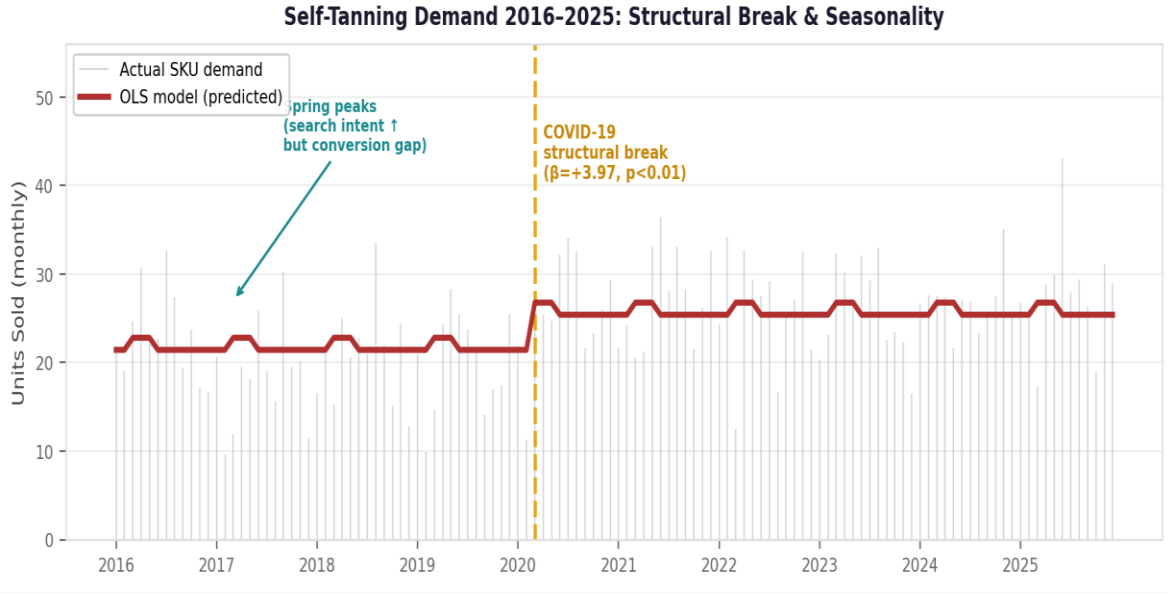
Step 02: Apply causal methods

OLS with structural break dummy (COVID-19), Welch t-tests for seasonality paradox, interaction terms — all in R

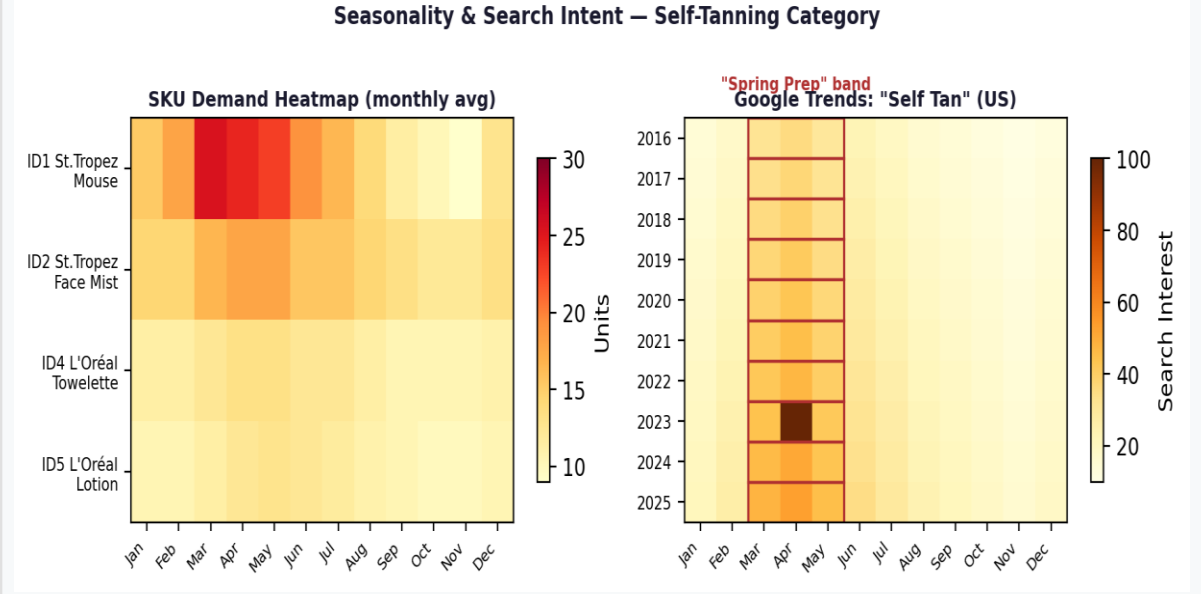
Step 03: IO interpretation

COVID shifts the good from seasonal luxury → year-round staple (Lipstick Effect). Black Friday inelastic: brand loyalty > price shock

Finding 1: COVID structural break — permanent demand uplift (β = +3.97, p < 0.01)



Finding 2: seasonality paradox — Spring intent spike does not convert (p = 0.29)



Students collect real data → build the model → deliver IO conclusions. This is the spirit of the course.

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...

Analytical and Computational Data Methods

Time series forecasting: stock returns, sales, growth rates

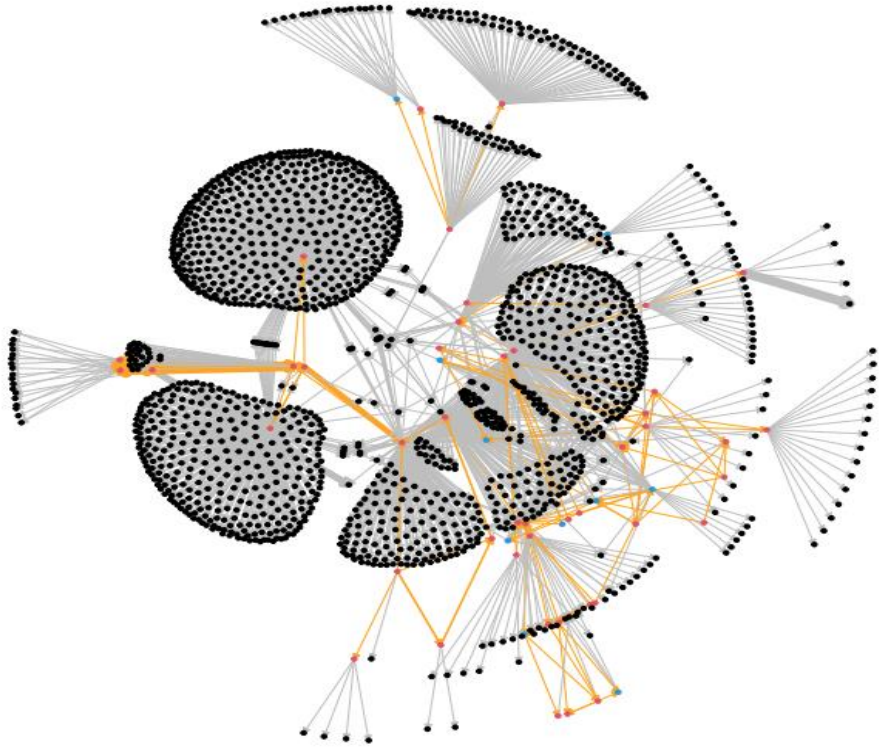
- Supervised machine learning: penalized regression, decision trees, random forests, neural networks

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

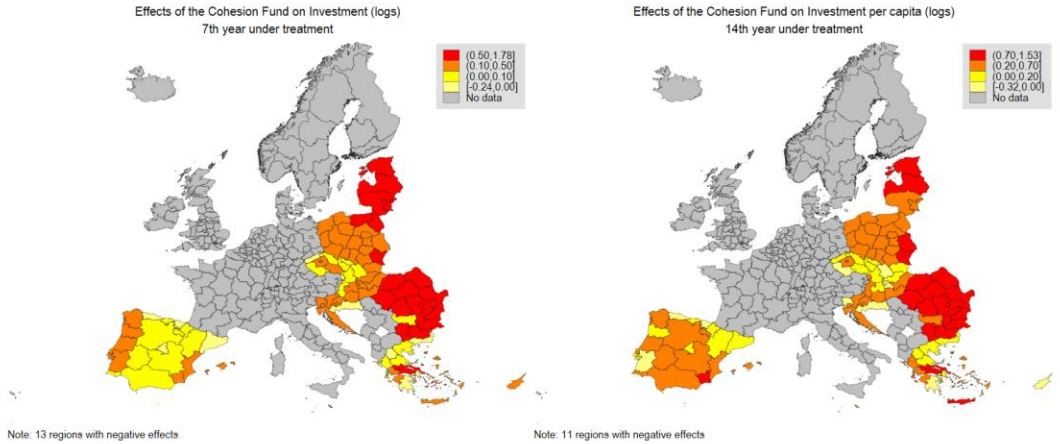
Analytical and Computational Data Methods

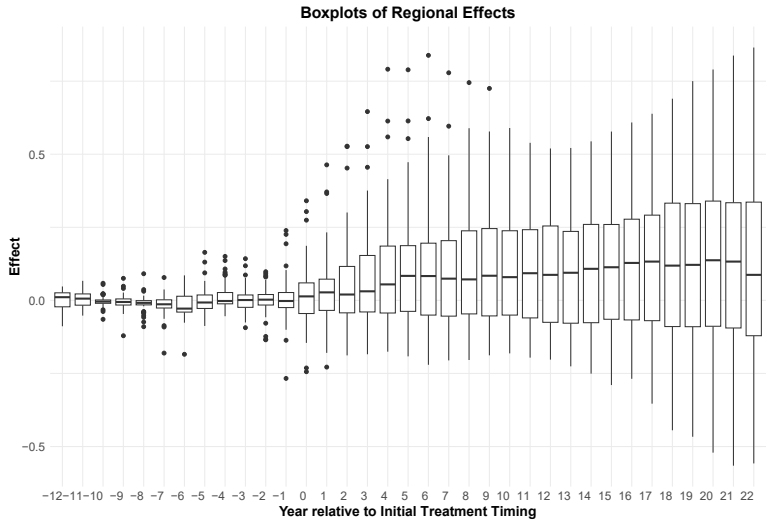
- **Nowcasting/Forecasting of macroeconomic indices**

  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

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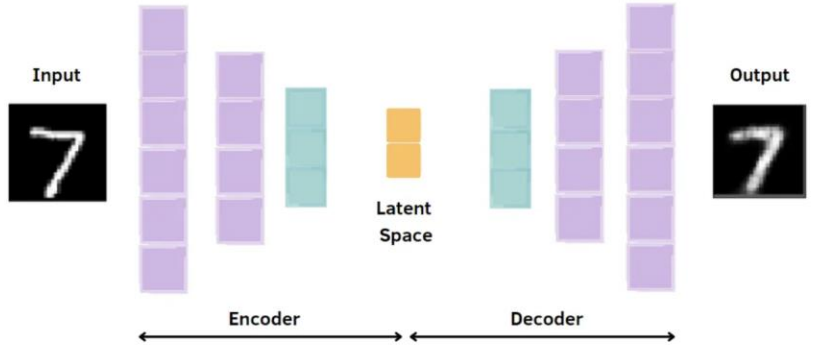
Python for Business Economics and Finance

Generative modelling through autoenconders



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

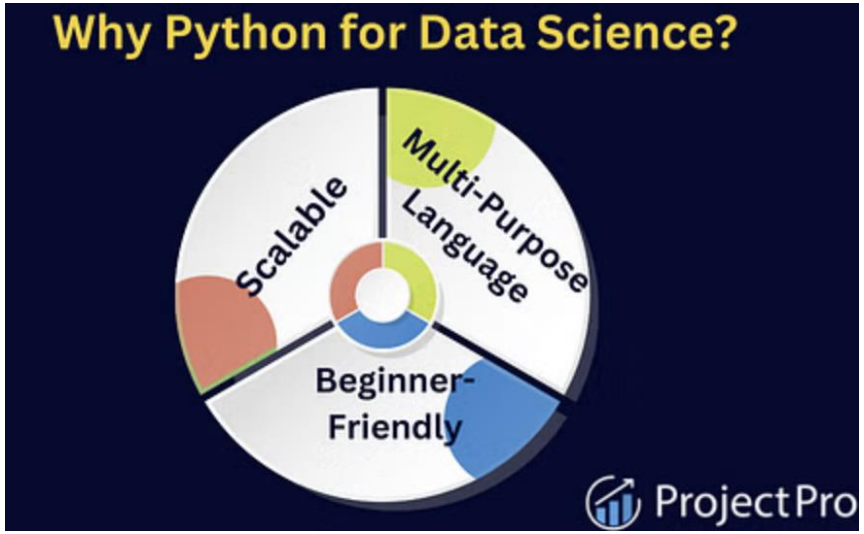
Free open-source program with **clear and readable** syntax (easy to learn)

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

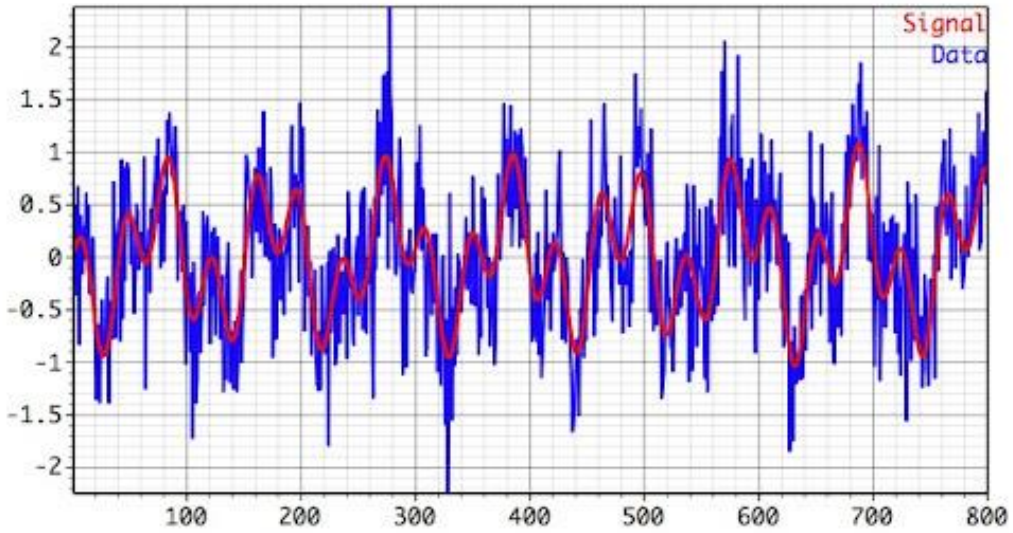
Increasing use in economics and finance



Data Analytics for Applied Macro

From Big Data to Economic Insight

- Work with real-world macro & financial datasets
- Handle Big Data: volume, velocity, variety, veracity (uncertainty)
- Extract signals from noisy, real-time environments
- Analyse inflation, economic activity, and financial conditions

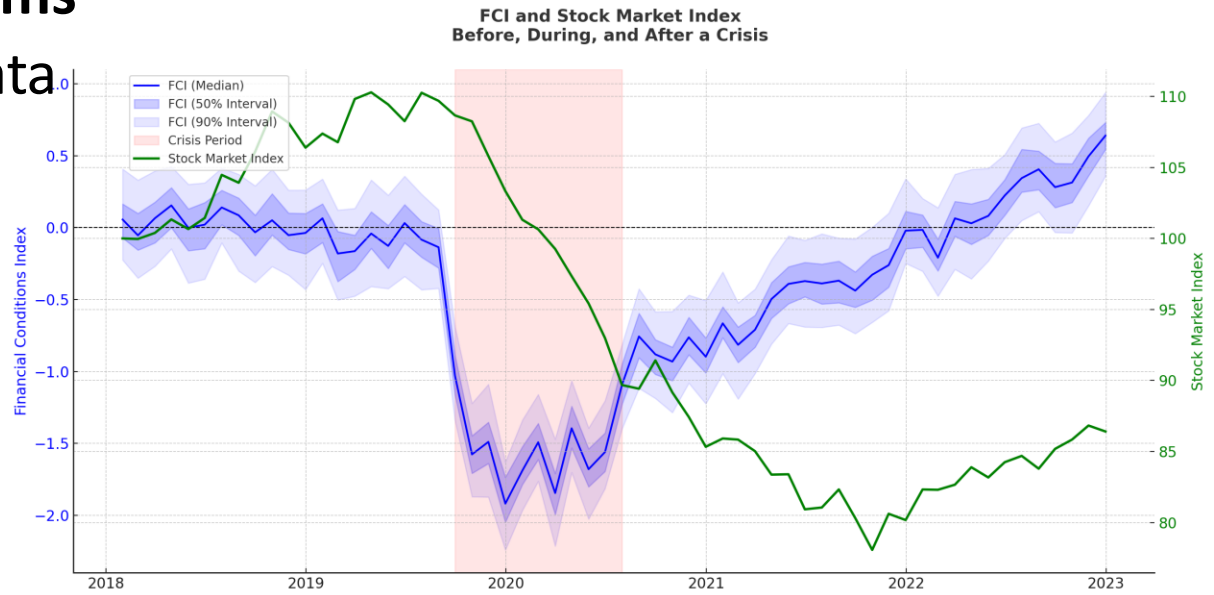


Raw data into decisions - like central banks and policy institutions

Data Analytics for Applied Macro

Machine Learning for Real Economic Problems

- Nowcasting & forecasting using modern data techniques
- Build composite indicators (e.g. financial conditions, sentiment)
- Combine economics with data science and coding (R)
- Understand not just prediction - but interpretation & risk

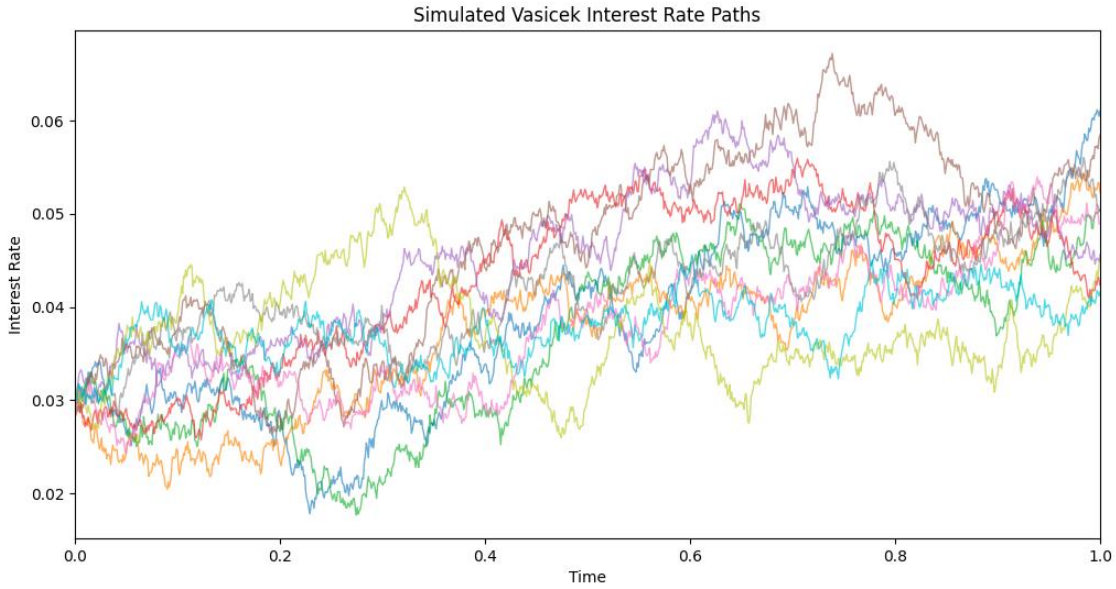


Think like a data-driven economist operating in real time

Financial Data Analytics

From Markets to Models

- Price bonds using stochastic models & Monte Carlo
- Analyse equities using financial ratios & forecasting
- Generate investment signals from real data
- Understand how markets react to uncertainty

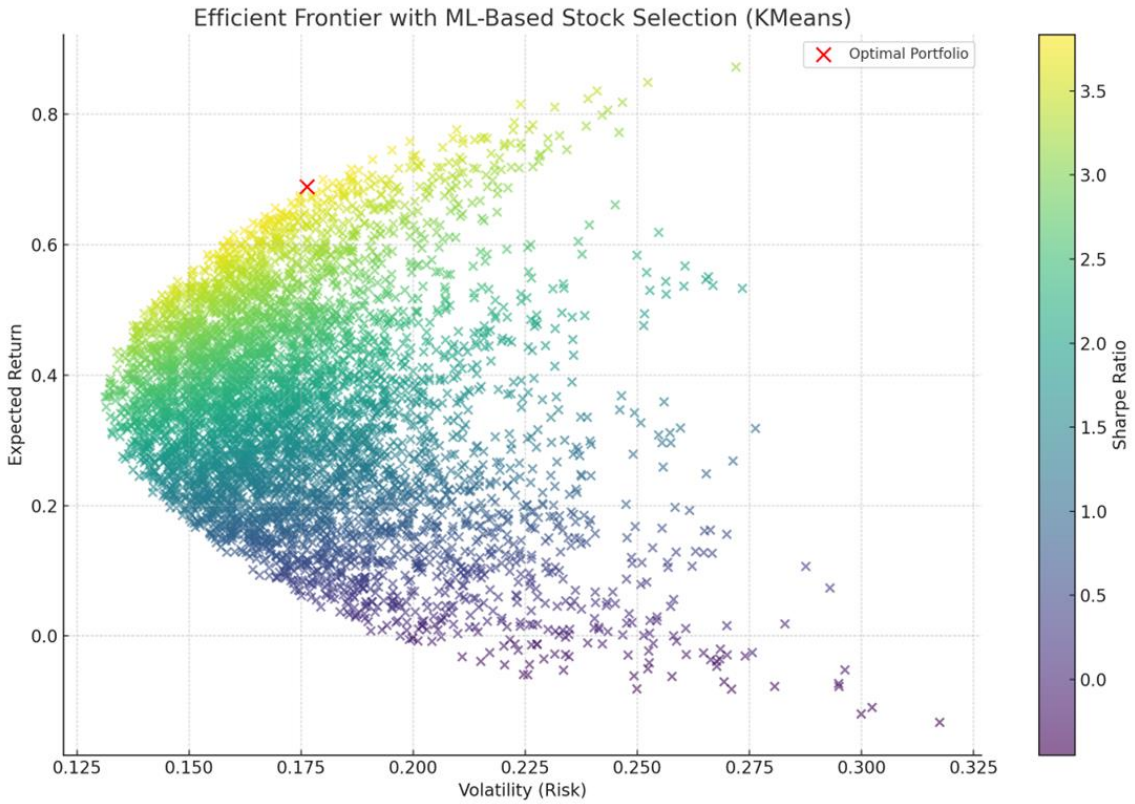


Translate financial theory into real investment insight

Financial Data Analytics

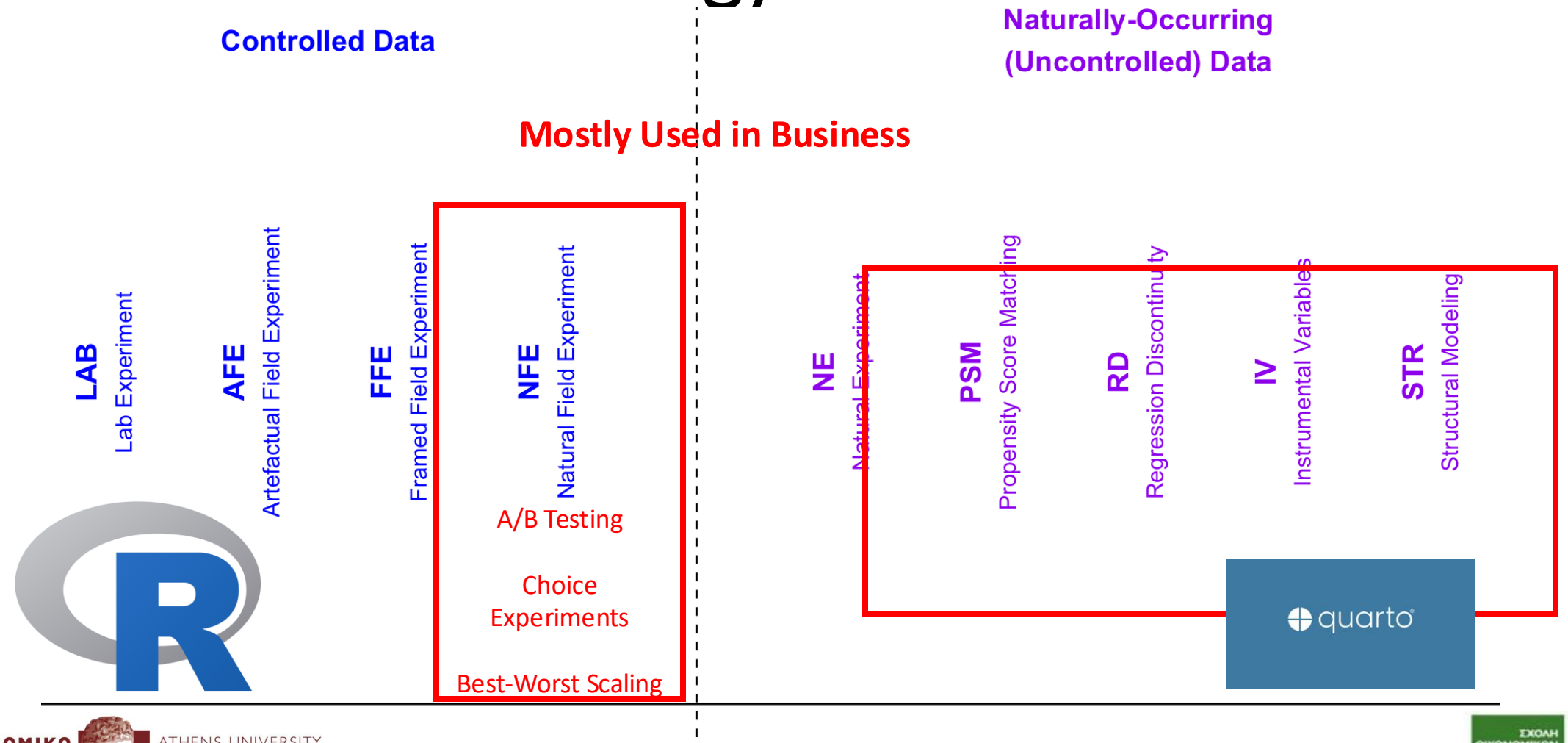
Build, Test, and Optimise Portfolios

- Portfolio optimisation & risk management
- Backtesting and real-world performance evaluation
- Machine learning in investing (signals, prediction, allocation)
- Work with real constraints: risk, turnover, rebalancing



A complete toolkit for data-driven investing and portfolio management

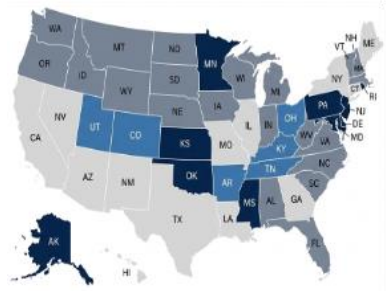
Data Analytics for Applied Microeconomics and Business Strategy

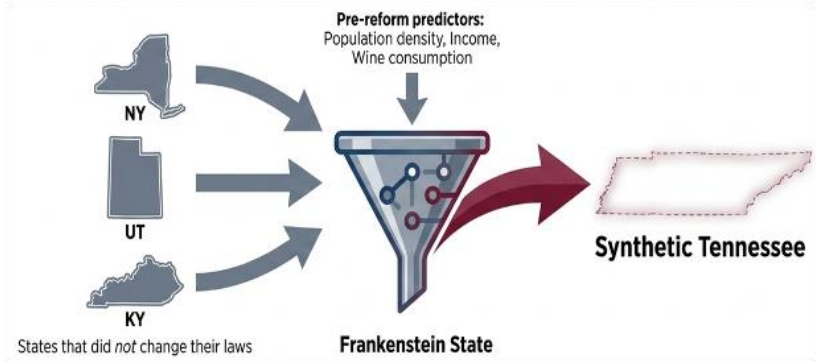


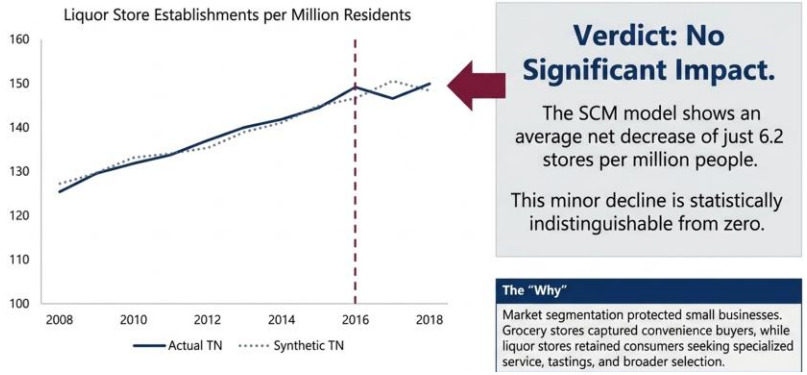
Data analytics for Applied Microeconomics and Business Strategy

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

- Synthetic Control Method







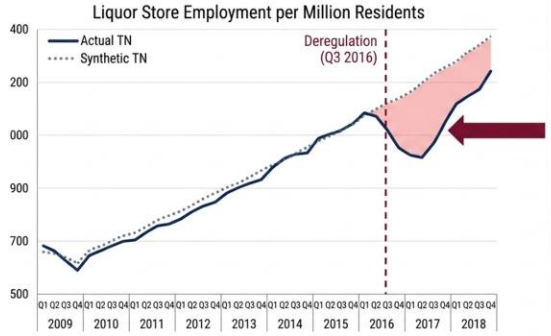
Verdict: No Significant Impact.

The SCM model shows an average net decrease of just 6.2 stores per million people.

This minor decline is statistically indistinguishable from zero.

The "Why"

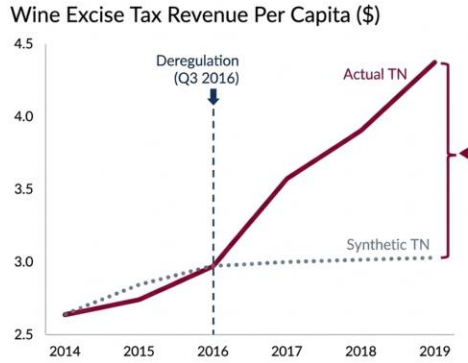
Market segmentation protected small businesses. Grocery stores captured convenience buyers, while liquor stores retained consumers seeking specialized service, tastings, and broader selection.



Verdict: Mixed, Short-Term Decline.

Analysis reveals a **peak drop of ~42.5 jobs per million** (a 6.8% reduction) roughly a year after implementation.

The **employment gap** begins to narrow significantly by the end of 2018, suggesting a temporary labor shock as businesses adjusted, rather than a permanent labor collapse.



Verdict: Massive Revenue Surge.

Tax revenue surged by an average of **$0.59** per capita over the baseline

This represents a **22%** increase in state wine excise tax revenue, equaling roughly **$2.9** million in new state funds (2.4 million more gallons sold).

The "Why"

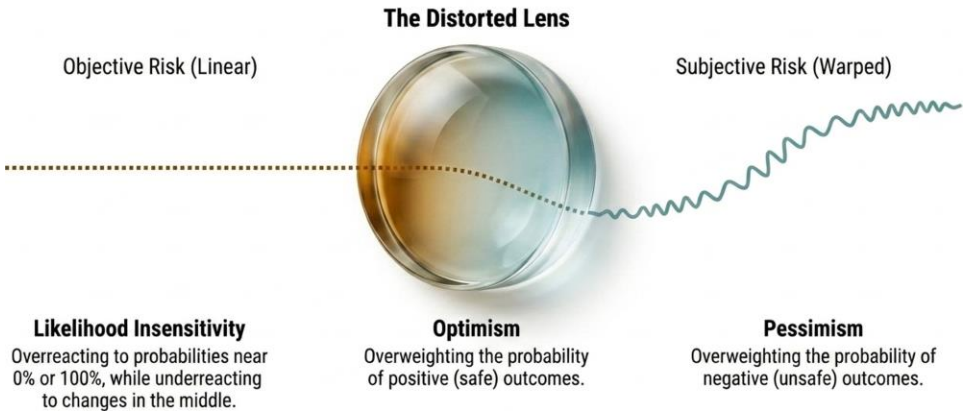
The pie didn't just slice differently; expanded market access, lower transaction costs, and greater consumer convenience grew the entire market.

Sun, Jiayu, Vincenzina Caputo, Aaron J.Staples, and Achilleas Vassilopoulos. 2025. "When Wine Walked into Grocery Stores: Examining the (un)intended Economic Consequences ofWine Sale Reform in Tennessee. **American Journal of Agricultural Economics**. https://doi.org/10.1111/ajae.70033

Data analytics for Applied Microeconomics and Business Strategy

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

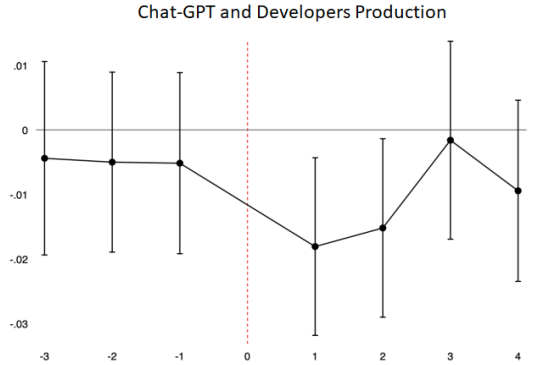
- Discrete Choice Experiment
  - State-Dependent Utility
  - Non-linear Probability Weight



	The Optimistic Pragmatist	The Pessimistic Protector
Economic Value (VSFAR)	$21	$173
Income & Diagnosis Status	Lower income, Undiagnosed, Self-focused	Higher income, Diagnosed, Purchasing for others
Subjective Safety Threshold	Views >75.5% as completely safe	Requires >93% to feel safe
Probability Sensitivity	Hyper-sensitive to mid-range probability changes	Highly insensitive to probability; views almost all risk as unacceptable

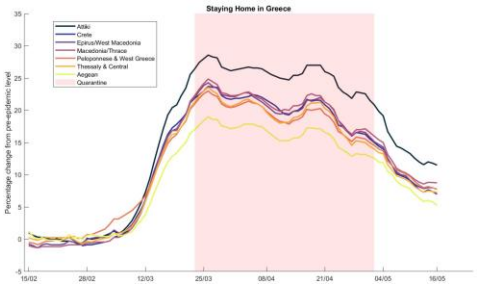
Vassilopoulos, A., Antoniak, M. and Cerjak, M., 2025. Risk perception in food safety and the Value of Statistical Mild Food-Induced Adverse Reactions. **Journal of Behavioral and Experimental Economics**, p.102461.

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

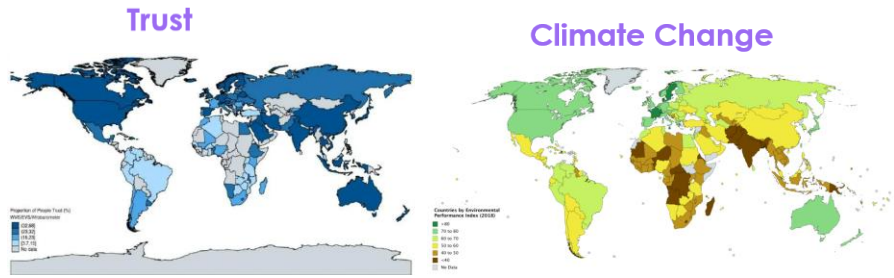
- **Google trends** using **R and Python** and GDP Dynamics
- Rise of Experiences Economy (**AirBnB**)
- **CEOs** firm decisions
- **Investors Financial Decisions:** Stock Market Participation
- Culture and Multinational **Marketing** Strategies (**Amazon/Skrouz**)
- **Inflation Expectations**

"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

- Μεθοδολόγία 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



Macroeconomics of Financial Markets (MacroFinance)

Content

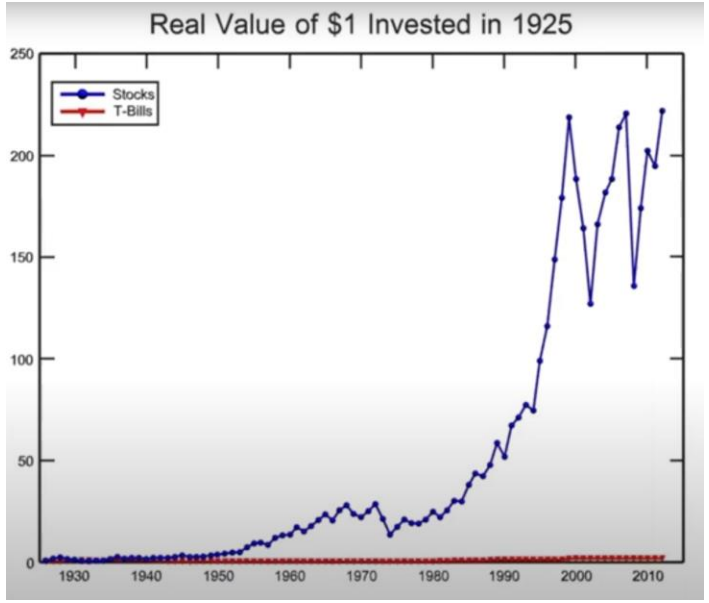
1. Asset Pricing
2. Real Economy ↔ Financial Markets

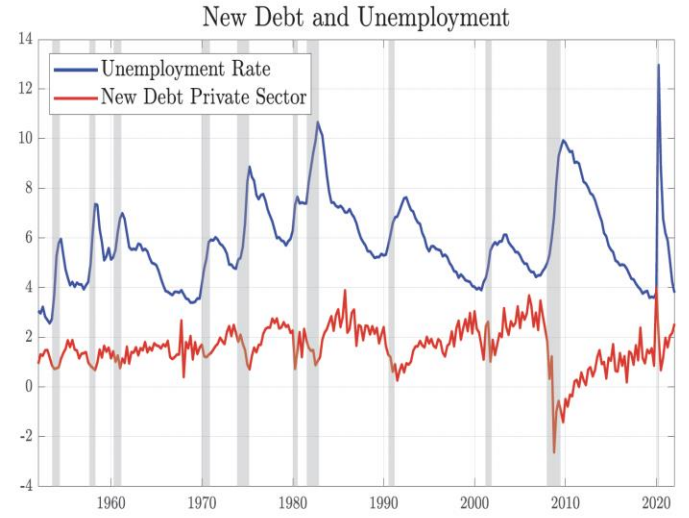
Tools

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)





📌 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

MSc-Master of Science
Business Economics with Analytics

ΕΛΛΑΔΑ

Τα hot μεταπτυχιακά του Οικονομικού Πανεπιστημίου Αθηνών

Ευχαριστούμε

για τη συμμετοχή σας

ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
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MSc IN
BUSINESS ECONOMICS WITH ANALYTICS