e-Financials

AI Meets Capital Market

Kolektívne investovanie na Slovensku 2026

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Content

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Equity Markets



AI Potential

- Assuming a daily **active user** base of 120 to 150 million professionals leveraging AI tools for work—drawn from a broader pool of over 400 million regular users worldwide—the market potential for AI monetization is immense. If roughly 10% to 15% of this overall active user base converts into paying subscribers at an average tier of $20 to $30 per month, software providers stand to generate between **$10 billion and $20 billion** in annual direct recurring revenue.
- When expanding to **enterprise-wide software integrations**, custom API consumption, and automated workflow agents, the broader addressable market for generative AI tools easily reaches **$100 billion to $150 billion** annually in the short-to-medium term as willingness to pay solidifies across corporate sectors.
- Looking at the broader **macroeconomic picture** with a total nominal GDP of $115 trillion to $120 trillion. Economic studies from major institutions project that artificial intelligence will boost global GDP by 1.2% to 1.5% annually, ultimately adding an estimated **$13 trillion to $15.7 trillion** to world economic output by 2030.

AI Potential

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Next-year dividend (D1)

100

Required return (r) 8.0%

Growth point 1 (g1) 3.0%

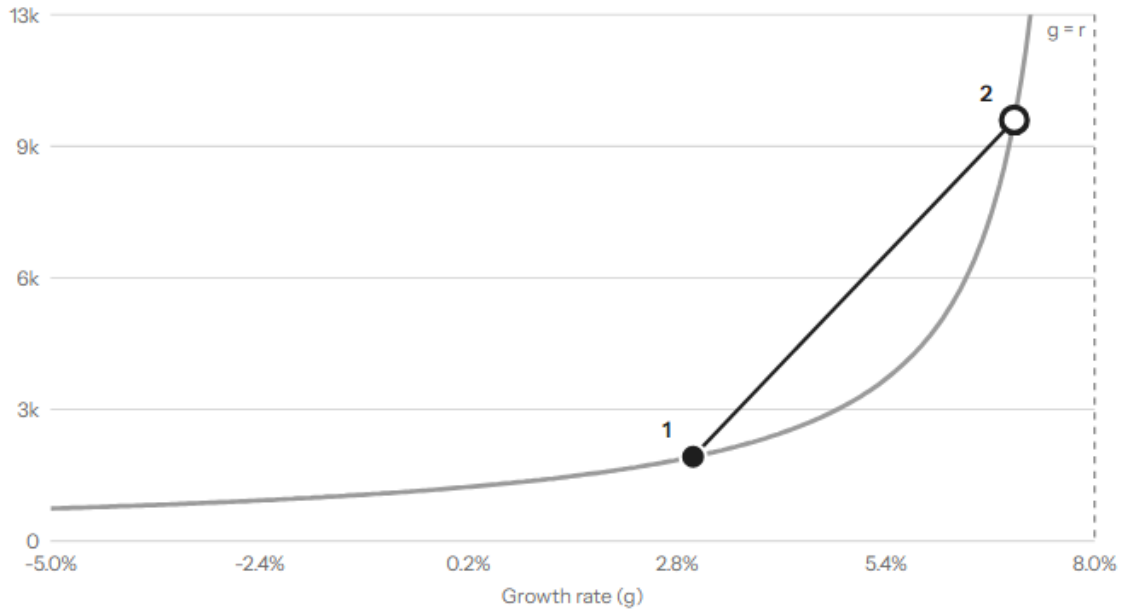
Growth point 2 (g2) 7.0%

The formula only works while growth stays below r. At g = r the price is undefined (the #DIV/0! row in your sheet).

Price at point 1	Price at point 2	Average price (points 1 and 2)
$2,000	$10,000	$6,000

Price as growth changes

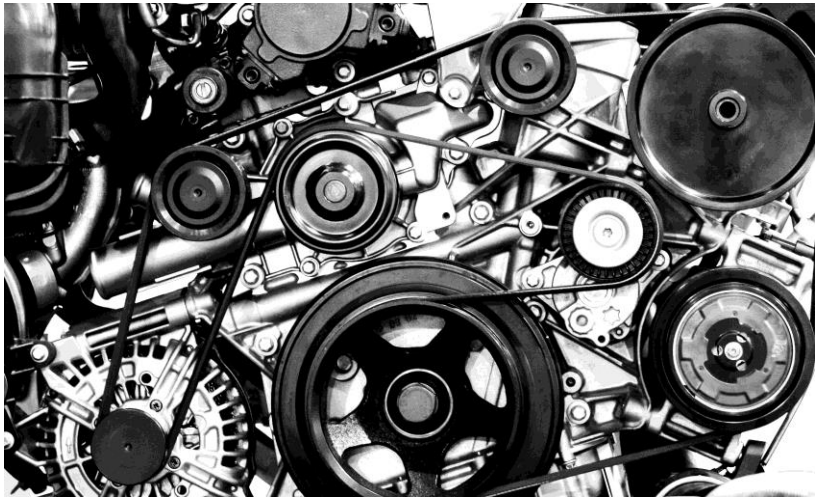
With r fixed at 8.0%. The gray curve is the true price; the black line is the straight path between your two points.



S&P Downturns



AI/Machine Learning



Features Engineering

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Future engineering is s process of using domain knowledge of the data to create features.

- **High-Dimensionality**: It can process and find correlations across thousands or millions of different variables (like every pixel in a video) simultaneously.
- **Non-Linearity**: AI can map complex relationships where the output doesn't change at a constant rate.
- **Feature Extraction**: Instead of a human manually defining what a "cat" looks like, the AI analyzes raw data to automatically discover which specific patterns or characteristics are the most important.
- **Generalization:** The ultimate goal of AI is to take patterns learned from past data and apply them accurately to brand-new scenarios. This allows a model to make intelligent predictions.

Features Engineering

Model Parameter	Democracy & Institutions	People (Individual Utility)	Companies (Equity Growth)	Economy (Macro GDP)
Primary Target (Y)	Institutional Health Index	Annual Gross Salary ($)	Future Target Price ($)	GDP per Capita Growth
Feature 1 (The Driver)	Info-Integrity Ratio (Verified vs. AI-Disinfo)	AI-Native Skill Tier (GenAI/Agentic Mastery)	Revenue Growth (YoY) (Core Momentum)	AI Infra Spend (Compute/Hardware per Cap)
Feature 2 (The Context)	V-Dem Liberal Score (Expert Baseline)	Regional Cost Index (Local Purchasing Power)	Net Profit Margin (Operating Efficiency)	Market Turnover Ratio (Capital Liquidity)
Feature 3 (The Risk)	Executive Check Count (Legislative Vetoes)	Experience Velocity (Years Exp. × Recency)	Malinvestment Ratio (Debt vs. Sales Growth)	B-READY Efficiency (Regulation Speed)

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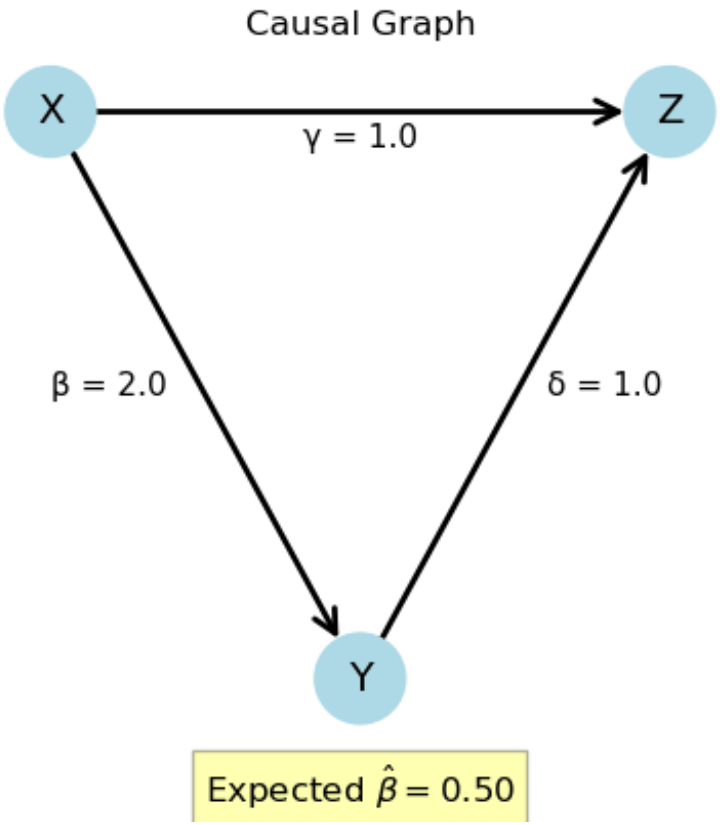
The Core Pillars of AI/ML

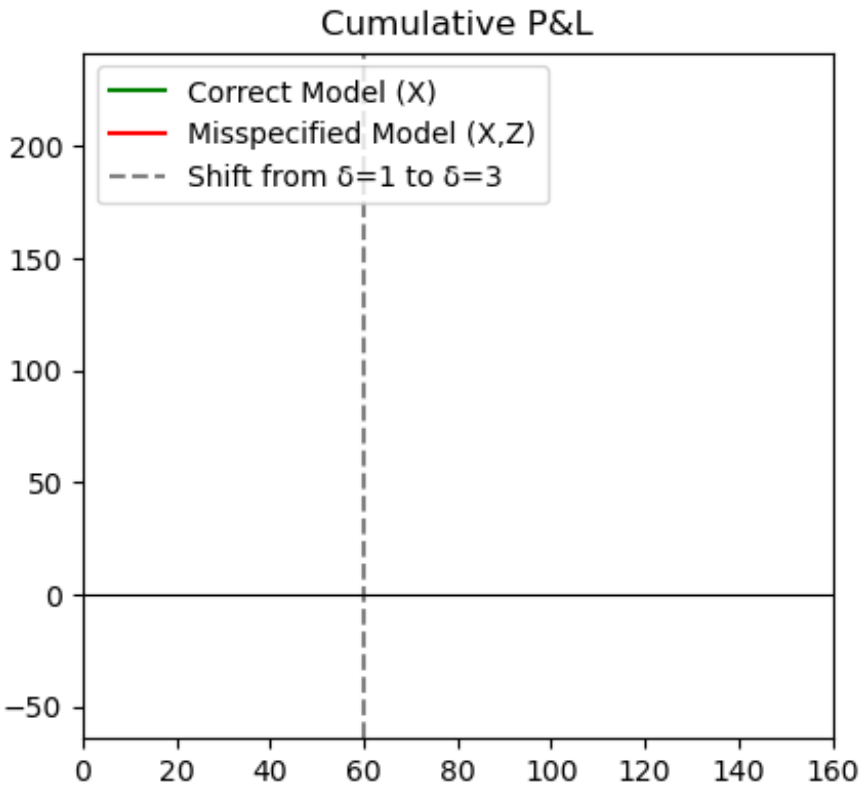
- **The Collider Bias** (The "Invisible" Trap): In many models, researchers "control" for variables to clean up the data. However, if they control for a collider (a variable influenced by both the factor and the returns), they inadvertently create a "mirage" of a relationship where none exists. This inflates the R^2 and lowers the p-values, making a useless strategy look like a "discovery".

- **The Confounder Bias**: Conversely, failing to control for a confounder (a third variable that causes both the factor and the returns) leads researchers to attribute returns to a factor that is actually just a "bystander."

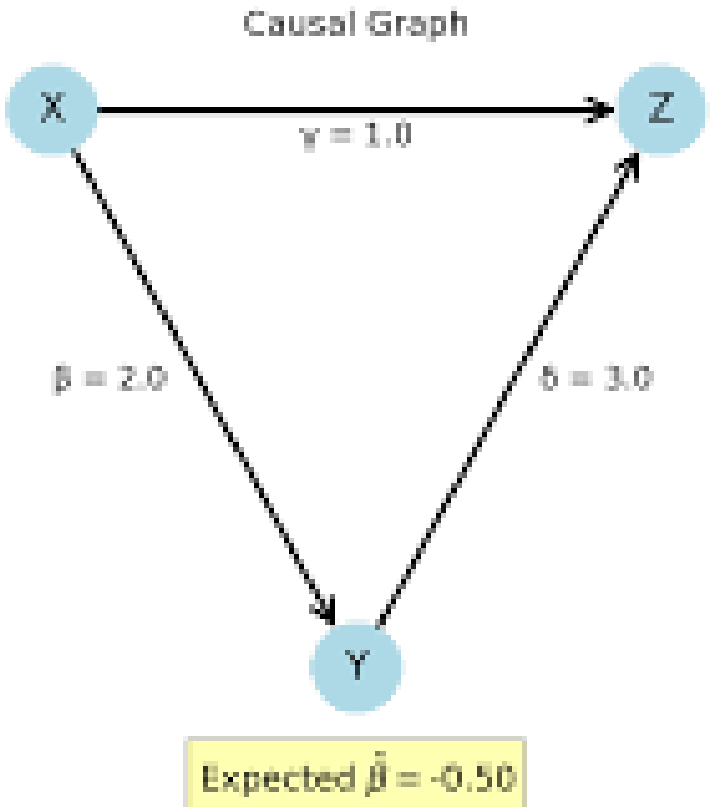
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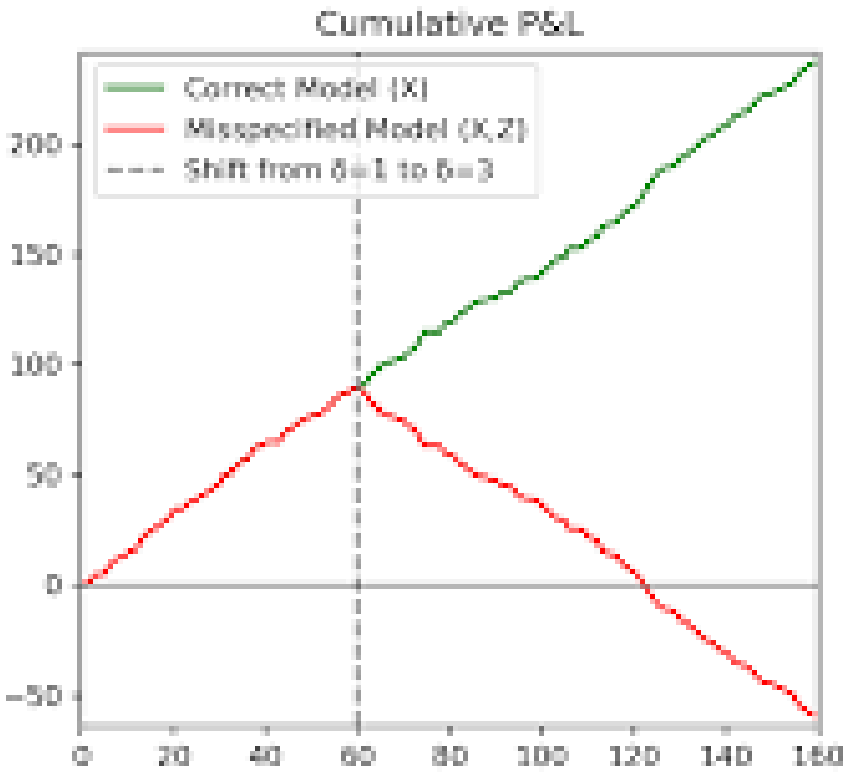
The Core Pillars of AI/ML



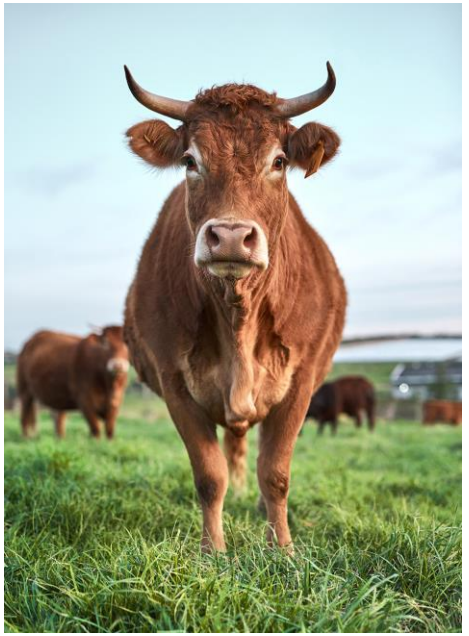


The Core Pillars of AI/ML





Pricing (illiquid) bonds



Bond pricing in general

- To price liquid/illiquid bonds we consider **Gradient Boosted Decision Trees** (GBDT) as a most advanced Machine Learning technique.
- However, reflecting the previous communication, we developed new methodology, **Clustering with Adjustments** (CwA)
  - STEP 1: Computation of an explicit comparable bonds sample within liquid bonds
  - STEP 2: Adjustment of comparable bonds sample features to the priced bond
- Both approaches have similar limitations related to data issues:
  1. we can utilize only information presented in the data,
  2. we mainly cover financial sector.

Bond pricing pros/cons

- **Gradient Boosted Decision Trees (GBDT)** – is an ensemble learning technique that iteratively corrects the errors of previous predictions by fitting new decision trees based on different attributes or features.
  - Advantage – handling non-linear cases and missing values, partial interpretation of outputs.
  - Disadvantage – inability to isolate and present a distinct group of comparable bonds within the dataset due to the inherent characteristics of the algorithm.

- **Clustering with Adjustments (CwA)**
  - Disadvantage – loosing the complexity and accuracy in comparison to more advanced machine learning techniques.
  - Advantage – good interpretability, ability to isolate and present a distinct group of comparable bonds, possibility to setup desired number of similar bonds.

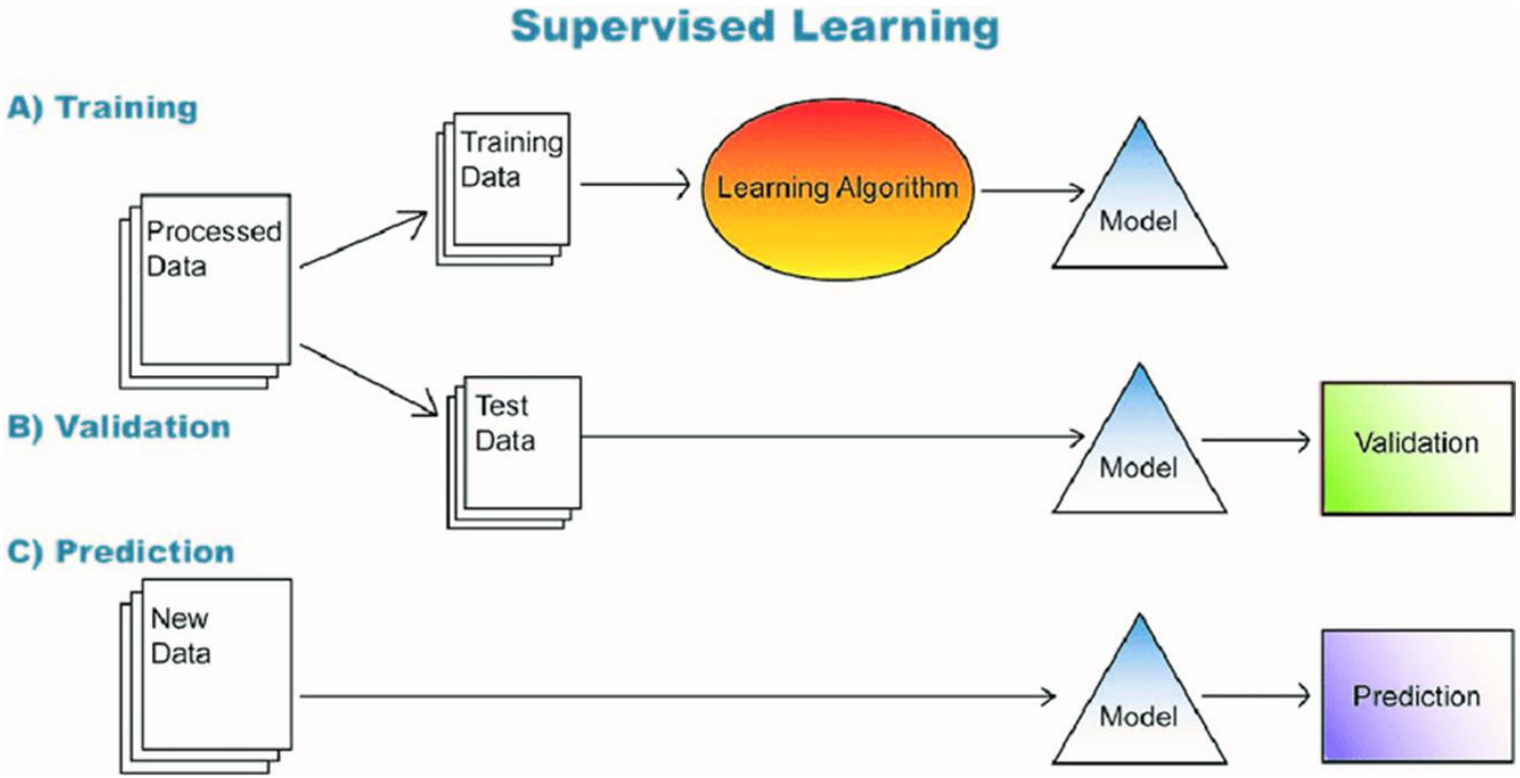
Clustering with Adjustments

- **STEP 1 - Finding comparable bonds:**
  - hierarchical clustering with complete linkage and connection requirement,
  - K-means/K-medioids method to create connection matrix.

- **STEP 2 – Adjusting attributes of comparable bonds to the priced bond:**
  - the adjustments are based on linear regression type of model, using interpretation of model parameters.

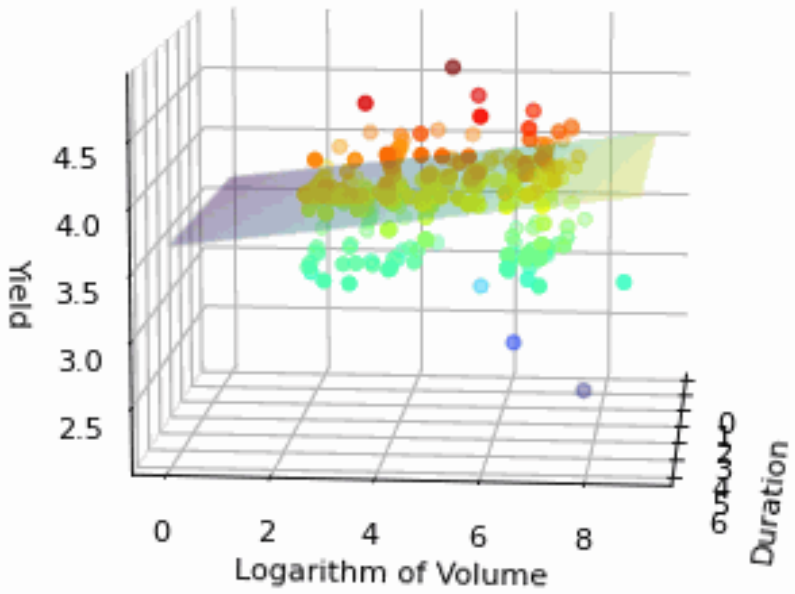
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AI Model

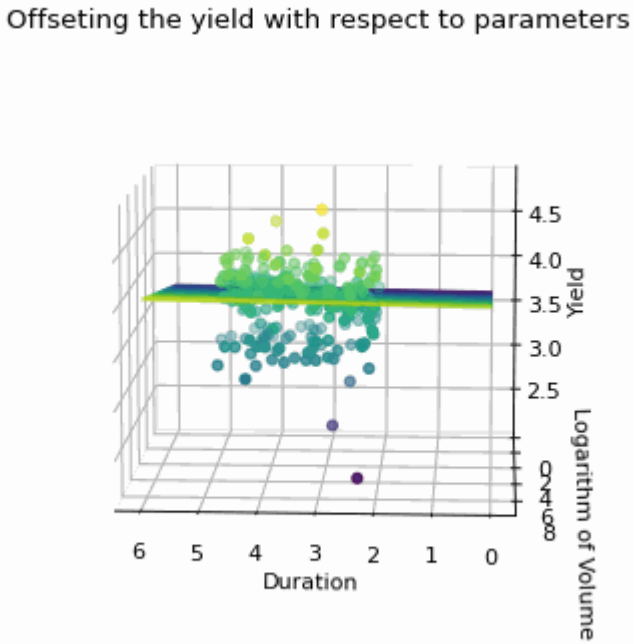


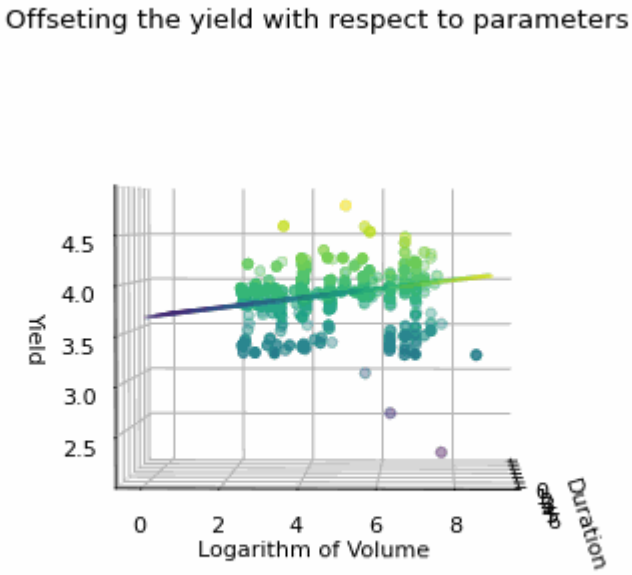
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Cheap / Expensive Bonds

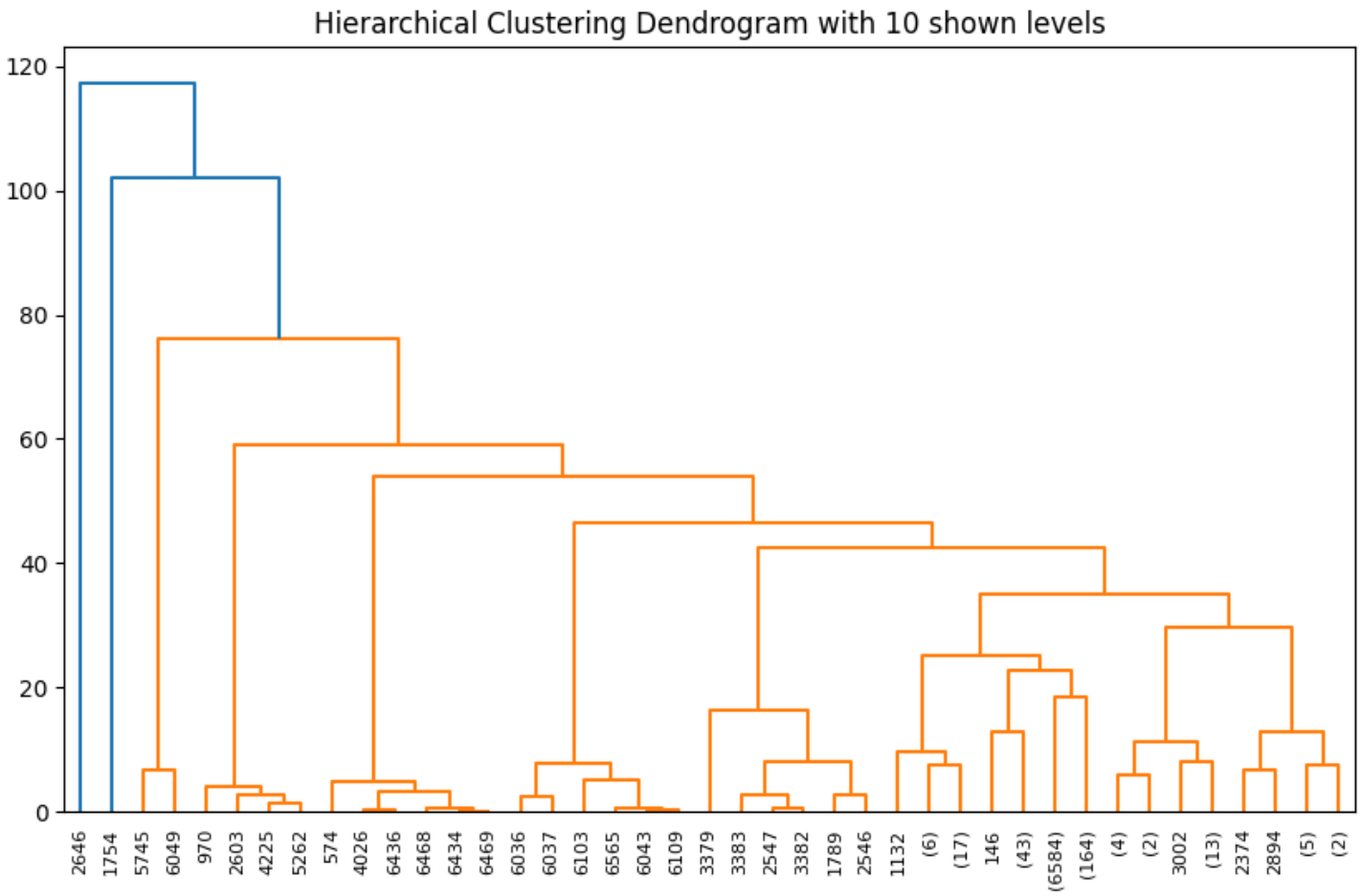


Clustering with Adjustments





Dendrogram


Hierarchical Clustering Dendrogram with 10 shown levels
120
100
80
60
40
20
0
2646
1754
5745
6049
970
2603
4225
5262
574
4026
6436
6468
6434
6469
6036
6037
6103
6565
6043
6109
3379
3383
2547
3382
1789
2546
1132
(6)
(17)
146
(43)
(6584)
(164)
(4)
(2)
3002
(13)
2374
2894
(5)
(2)

AI Boom Investing



Enhanced S&P500 Index Replication

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The project aims to enhance traditional S&P 500 index investing by identifying companies that are best positioned to benefit from AI while reducing exposure to businesses vulnerable to AI-driven disruption.

The strategy evaluates companies based on:

- Their role in the AI value chain.
- The economic impact of AI on their business.
- Their financial strength and ability to fund investments.

Objective: Generate consistent risk-adjusted outperformance while maintaining controlled exposure to the S&P 500.

Enhanced S&P500 Index Replication

AI Winners — Overweight

- AI infrastructure and technology providers with strong pricing power.
- Companies benefiting from AI-driven productivity and margin expansion.
- Businesses with strong cash flows and sustainable financing.

AI Vulnerabilities — Underweight

- Legacy service providers exposed to AI-driven commoditization.
- Companies facing pricing pressure and declining profitability.
- Highly leveraged businesses forced to invest in AI without clear returns.

Enhanced S&P500 Index Replication

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A systematic, data-driven investment process

The project combines financial data, AI exposure analysis, factor construction, portfolio optimization, and historical back testing.

- Rebalancing: Quarterly, based on publicly available financial information.
- Back testing: Historical analysis covering 2021–2026.
- Validation: Out-of-sample testing and paper trading.
- Risk management: Controlled tracking error and benchmark-relative exposure.

Target Outcome: Achieve at least 1% annual risk-adjusted alpha above the S&P 500 by capturing AI-driven structural winners and avoiding companies facing long-term disruption.

Summary

- **AI in Capital Markets**: Explores how AI and machine learning are transforming capital markets, creating new investment opportunities and risks, and enabling AI monetization.
- **Machine Learning in Finance**: Examines feature engineering, predictive modeling, and pattern recognition to improve financial analysis and investment decisions.
- **AI in Bond Valuation**: Applies AI to illiquid bond pricing, comparing Gradient Boosted Decision Trees with Clustering with Adjustments to estimate fair value.
- **AI-Driven S&P 500 Strategy**: Develops an enhanced index replication strategy using fundamental clustering and AI-disruption screening to identify potential winners and losers.