

Weekly Meeting Agenda



01

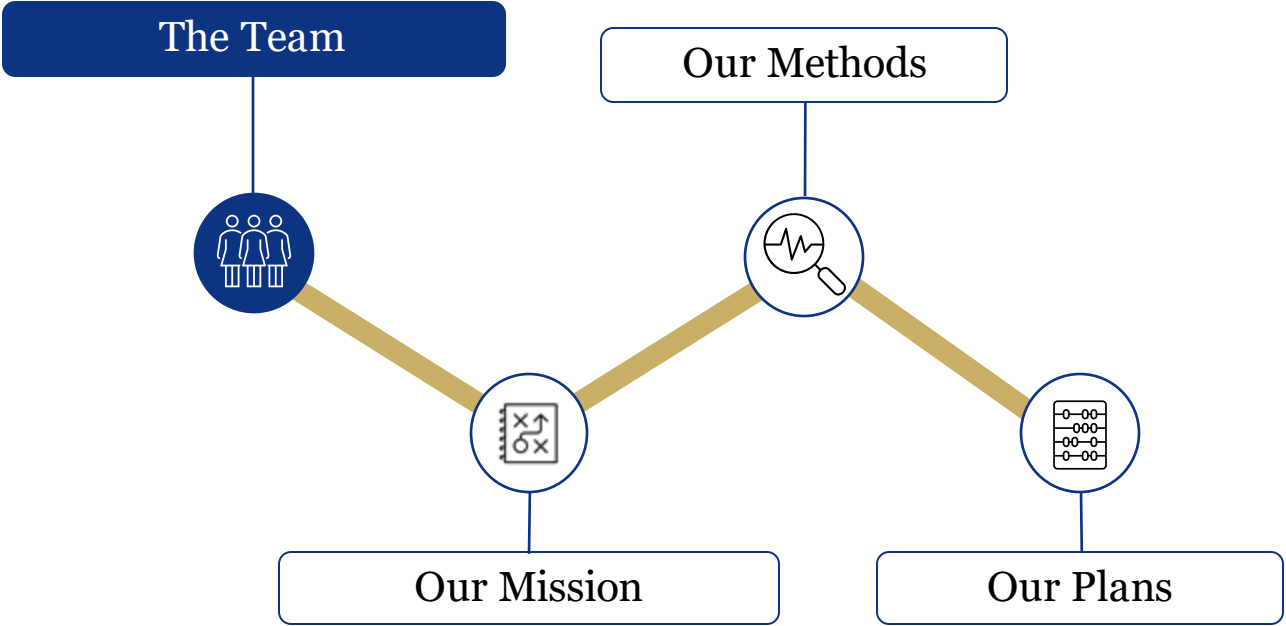
Specialized Teams Pitches

Our Specialized Teams Will Present Themselves and Their Projects For This Semester



Risk

Σigma
Investments

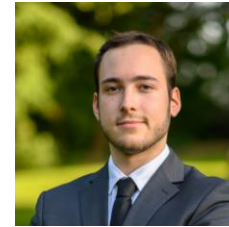


Σigma
Investments

The Team



- Alexandre Martens
- Senior Risk Analyst
- Lead developer



- Max Malata
- Junior Analyst
- Portfolio Optimization



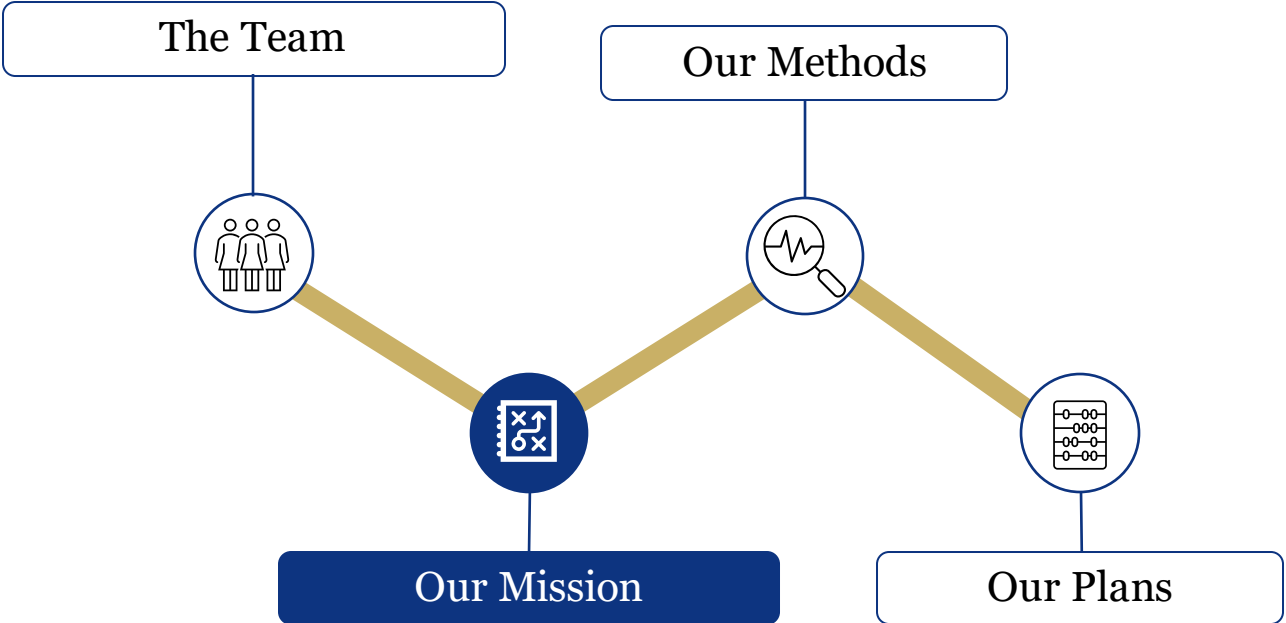
- Constantin Hinz
- Junior Analyst
- Geographic and Currency Risk



- Epifanios Evangelou
- Junior Analyst
- Value-at-Risk



- Victor den Ouden
- Junior Analyst
- Risk Simulation

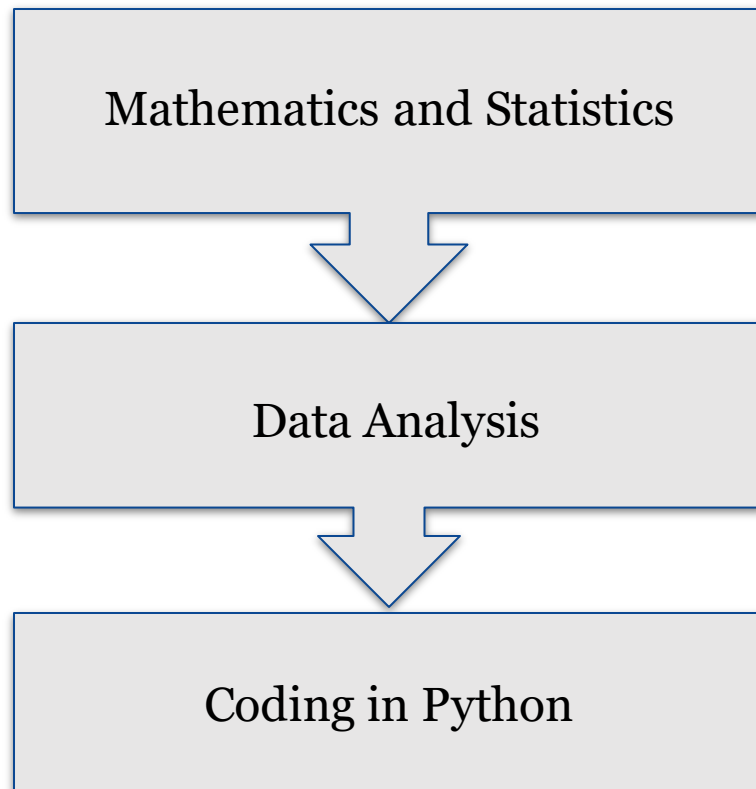


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About the Risk Team

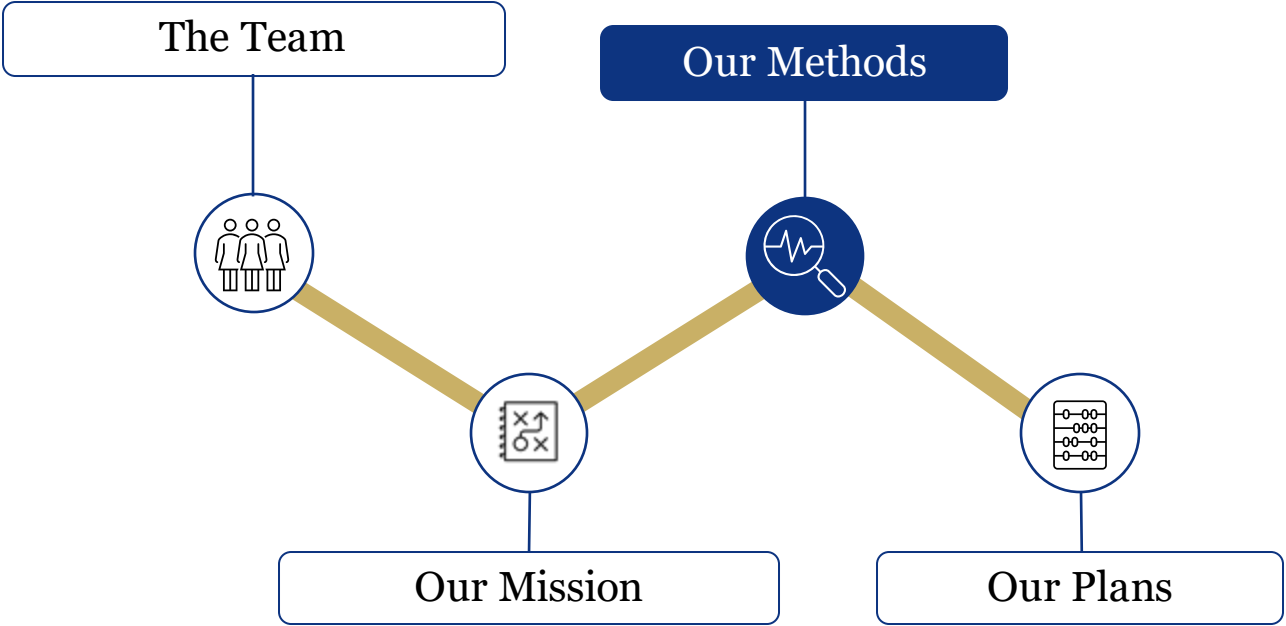


What do we do?



Why do we do it?

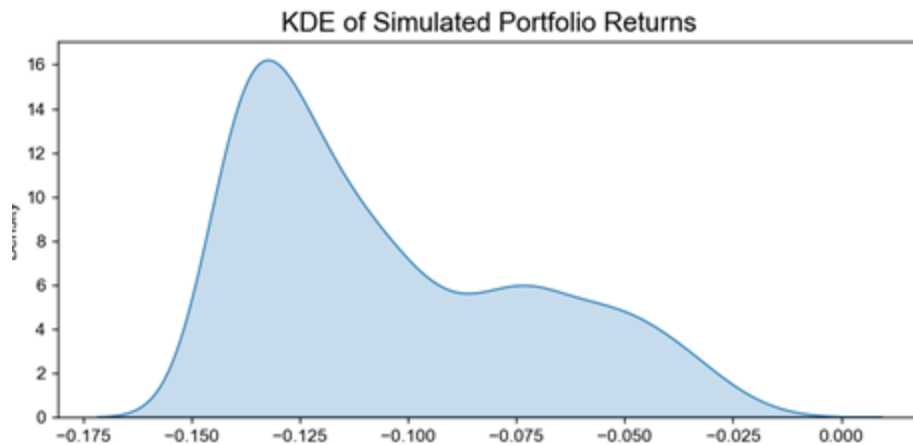
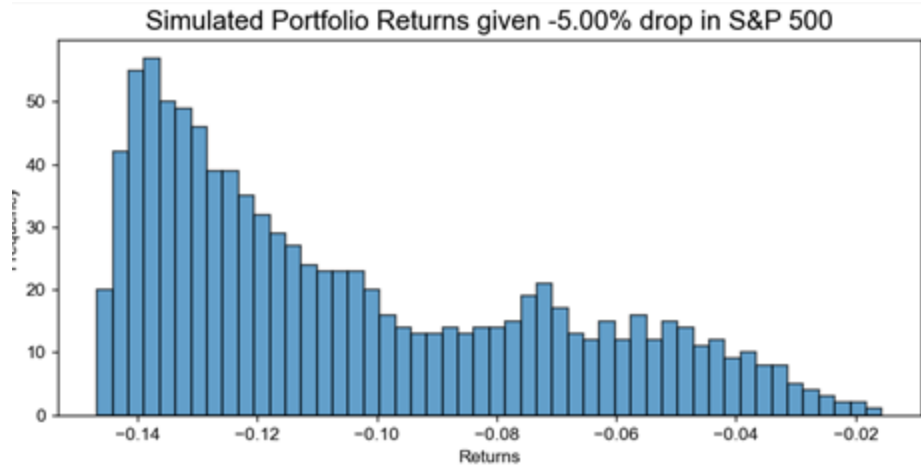
- Identify risk profile
- Protect fund against large losses
- Reduce concentration of risk
- Locate and evaluate potential additions



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Copula Functions

Calculating Effects



Application

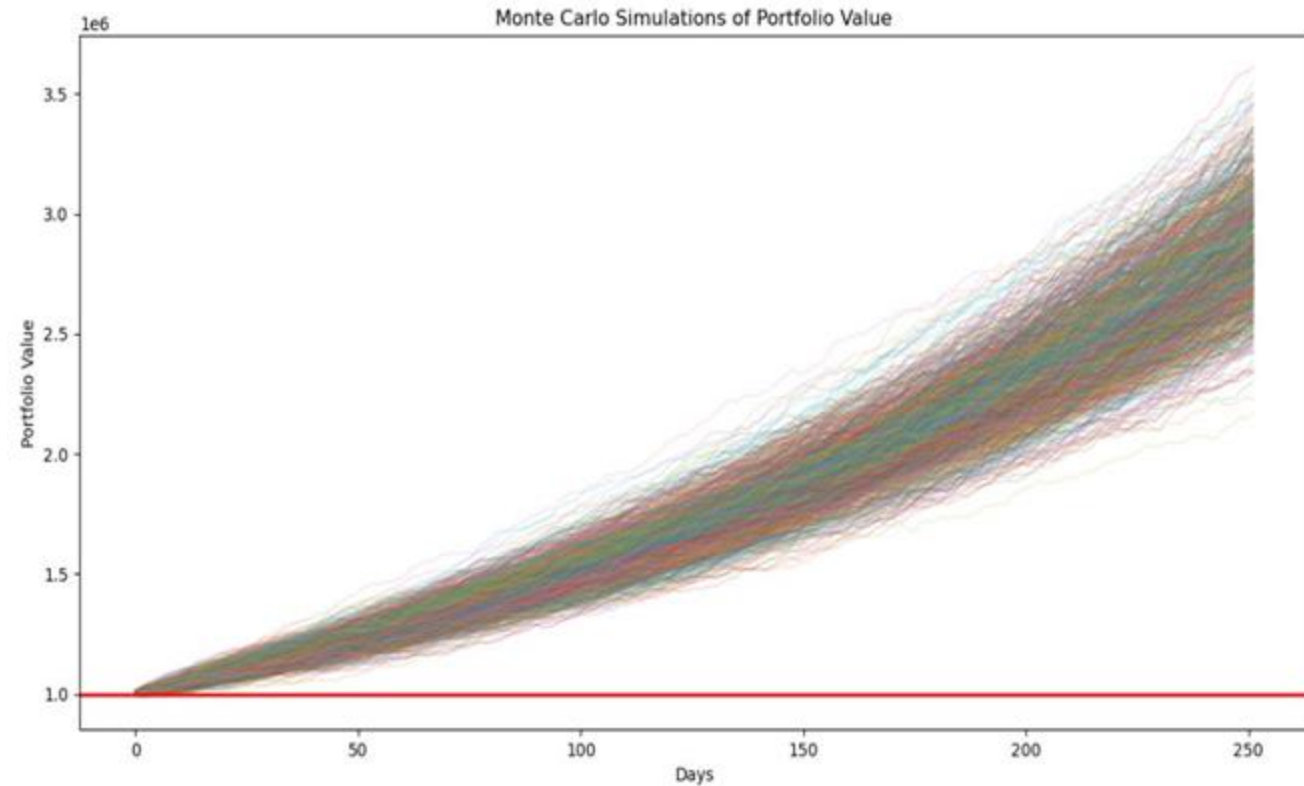
- Financial markets are not always normally distributed
- Multiple univariate distributions \rightarrow one multivariate distribution
- Normalizes marginal distributions
- Enables comparison

Monte Carlo Simulation



Estimating Outcomes

- Shows the spectrum of probable portfolio outcomes
- Repeatedly assigns random values to variables
- Helps explain impact of risk and uncertainty on a portfolio
- Assumes perfectly efficient market



Portfolio Optimisation



Finding the optimal allocation of assets

What is it all about?

- Finding the optimal allocation of assets for a specific goal
 - *min risk*
 - *max return*
 - *max sharpe ratio*
- Finding and balancing assets with low correlation to achieve diversification
- Building on the work of analysts and investors

Challenges and Factors to consider :

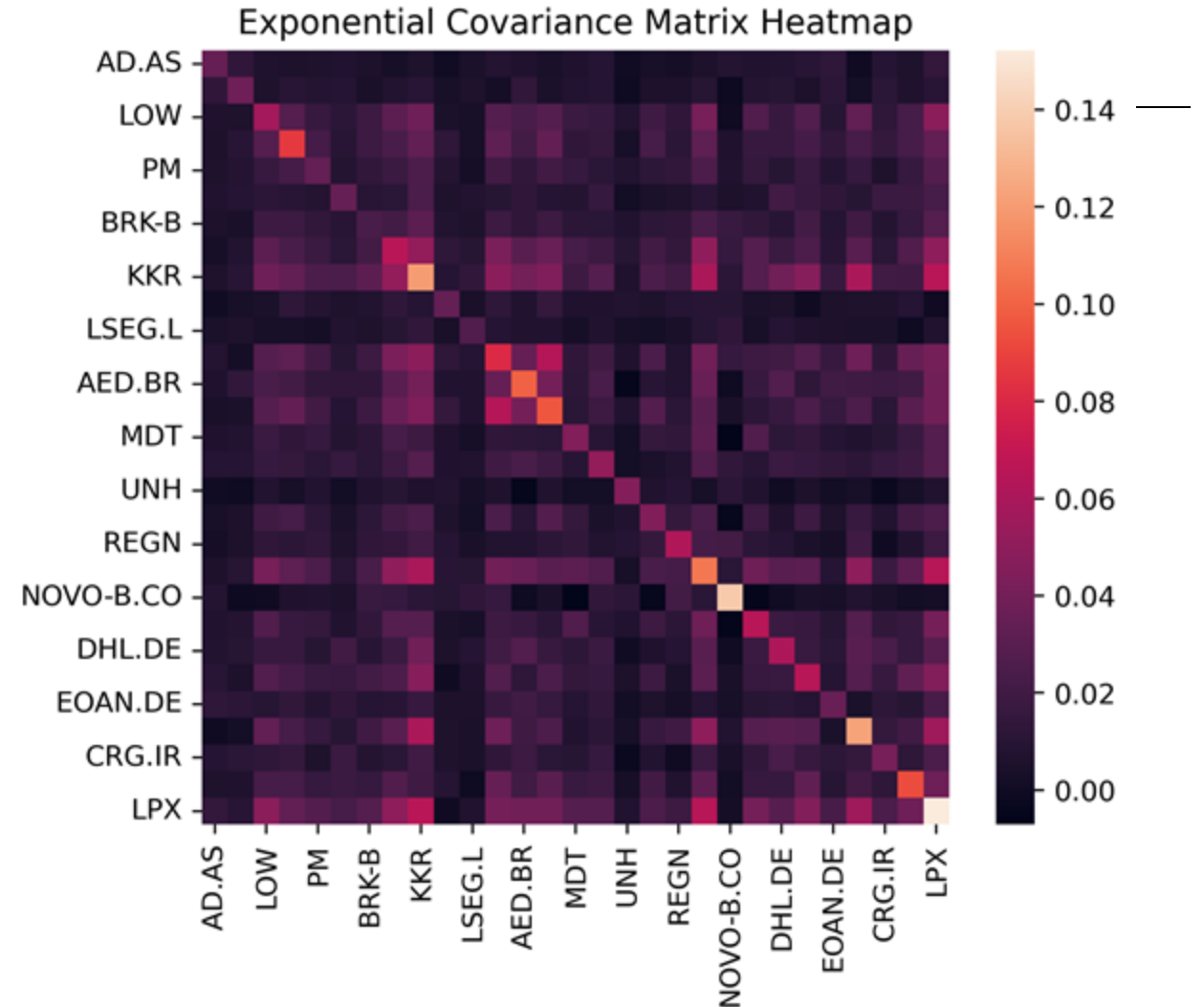
- Minimum and Maximum weights
 - *per stocks*
 - *per industry*
- Transaction costs
 - *costs associated with rebalancing*
- Maintaining high diversification
 - *avoid over concentrated weights*
- Finding the best and most accurate risk measure

Portfolio Optimisation



Finding the optimal allocation of assets

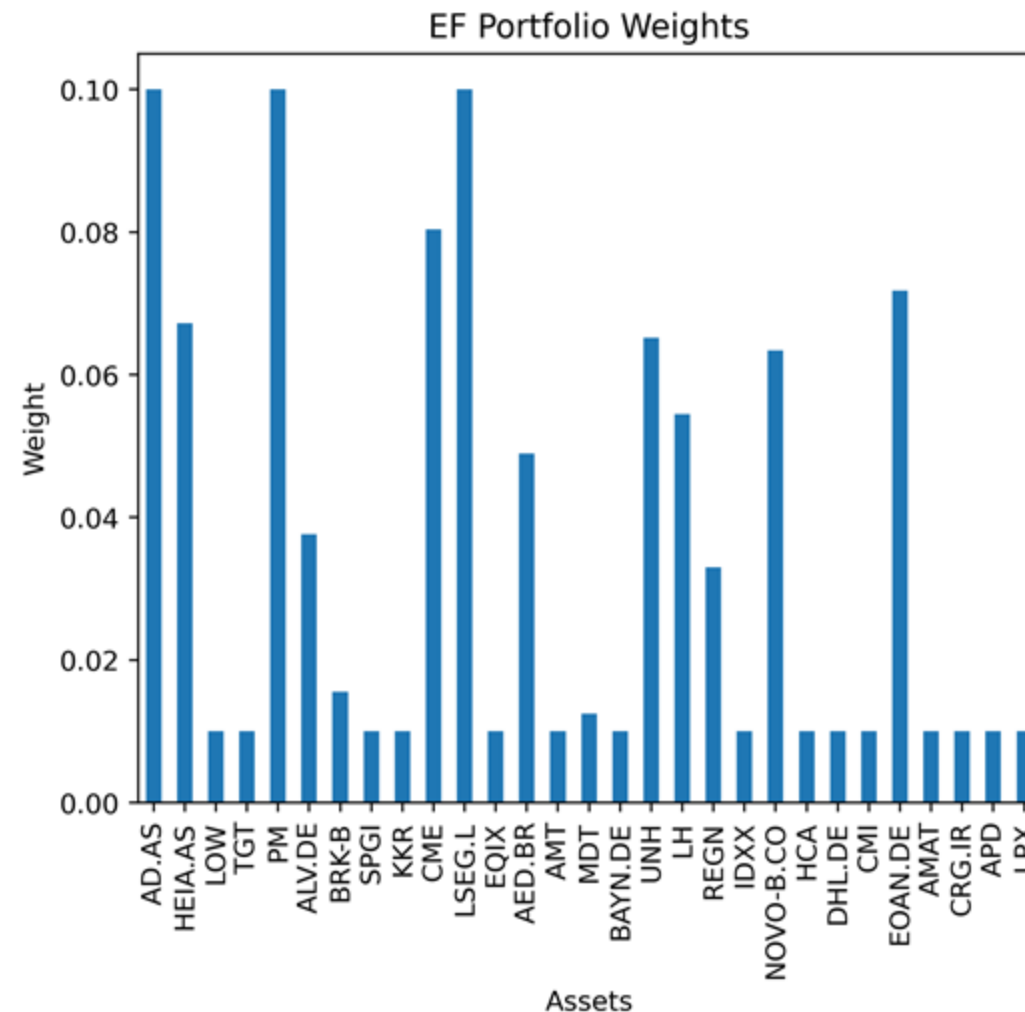
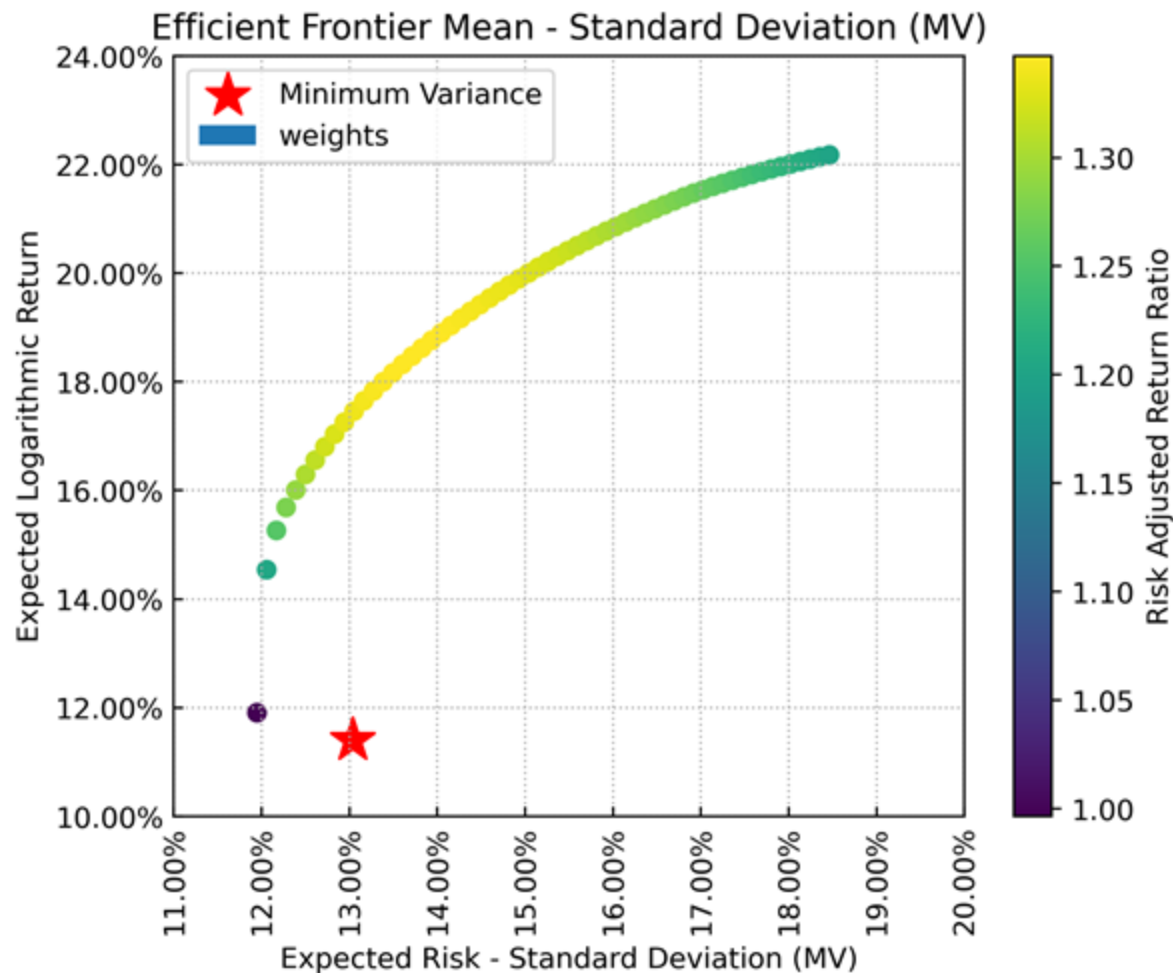
	MV	MAD	MSV	FLPM	SLPM	CVaR	EVaR	WR	MDD	ADD	CDaR	UCI	EDaR
AD.AS	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,03	0,06	0,01	0,1	0,04
HEIA.AS	0,1	0,06	0,07	0,055	0,063	0,03	0,06	0,1	0,1	0,07	0,1	0,1	0,1
LOW	0	0,01	0,01	0,01	0,01	0,02	0,01	0	0,01	0,01	0,01	0	0,01
TGT	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
PM	0,1	0,1	0,08	0,093	0,081	0,08	0,06	0,1	0,1	0,1	0,1	0,1	0,1
ALV.DE	0	0,06	0,04	0,076	0,045	0,04	0,1	0,1	0,01	0,05	0,01	0	0,01
BRK-B	0	0,02	0,03	0,046	0,049	0,06	0,03	0	0,01	0,01	0,01	0	0,01
SPGI	0	0,01	0,01	0,01	0,01	0,01	0,01	0,1	0,01	0,01	0,01	0	0,01
KKR	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
CME	0,1	0,07	0,08	0,072	0,074	0,06	0,01	0	0,01	0,03	0,01	0	0,01
LSEG.L	0,1	0,1	0,1	0,088	0,1	0,1	0,08	0	0,1	0,1	0,1	0,1	0,1
EQIX	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
AED.BR	0	0,05	0,06	0,024	0,038	0,06	0,1	0,1	0,01	0,01	0,01	0	0,01
AMT	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
MDT	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
BAYN.DE	0	0,01	0,01	0,01	0,01	0,02	0,05	0,1	0,1	0,01	0,07	0	0,1
UNH	0,1	0,07	0,08	0,075	0,079	0,1	0,01	0	0,01	0,1	0,1	0,1	0,03
LH	0,1	0,05	0,05	0,044	0,047	0,04	0,08	0,1	0,01	0,01	0,01	0	0,01
REGN	0	0,03	0,02	0,019	0,015	0,06	0,01	0	0,08	0,06	0,09	0,1	0,07
IDXX	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
NOVO-B.CO	0,1	0,07	0,07	0,1	0,095	0,05	0,08	0,1	0,1	0,1	0,1	0,1	0,1
HCA	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
DHL.DE	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
CMI	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,1	0,1	0,1	0,1	0,1
EOAN.DE	0,1	0,06	0,06	0,048	0,055	0,03	0,09	0	0,01	0,06	0,01	0	0,01
AMAT	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01
CRG.IR	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,02	0,01	0	0,01
APD	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,09	0,01	0,03	0	0,06
LPX	0	0,01	0,01	0,01	0,01	0,01	0,01	0	0,01	0,01	0,01	0	0,01



Efficient Frontier (EF) Portfolio



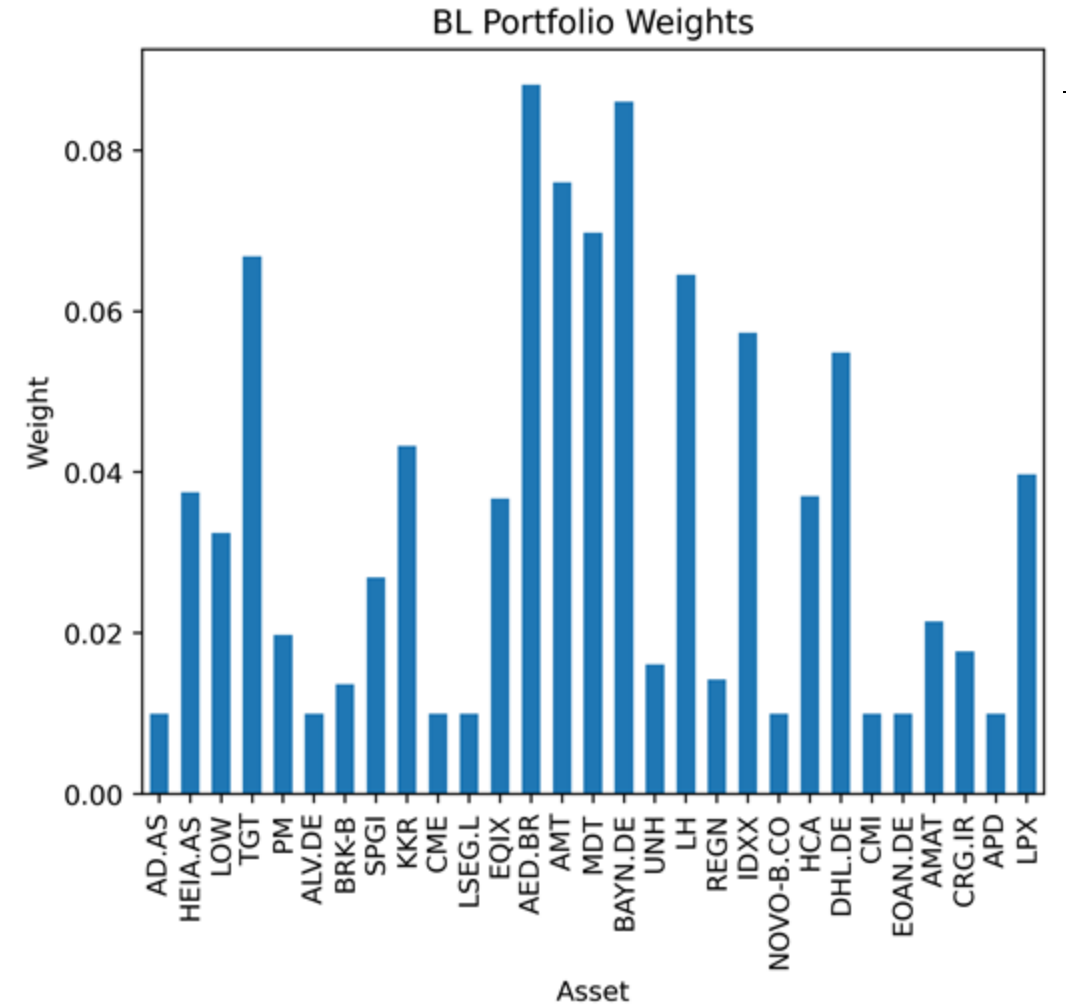
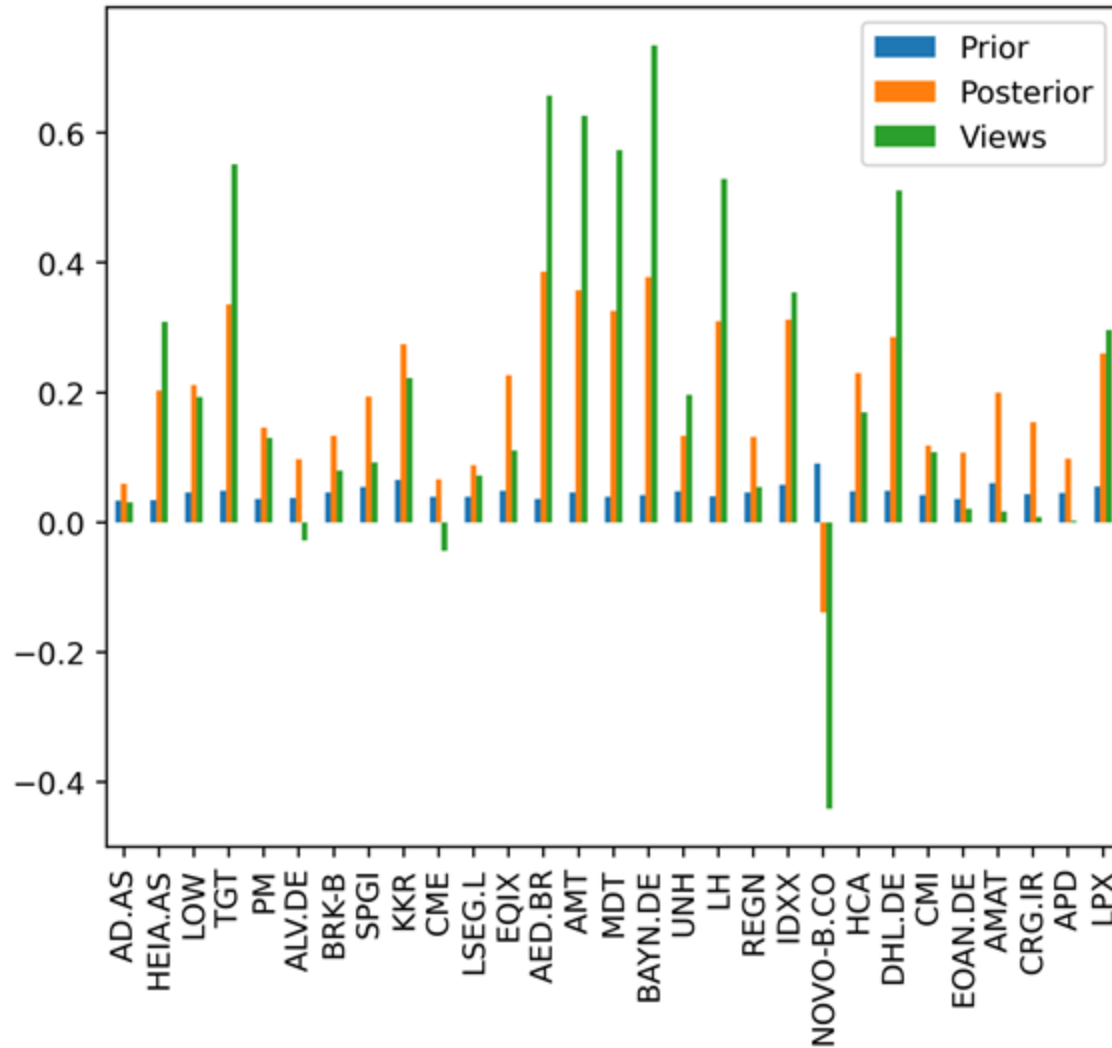
Methods based on classical portfolio theory



Black-Litterman (BL) Portfolio



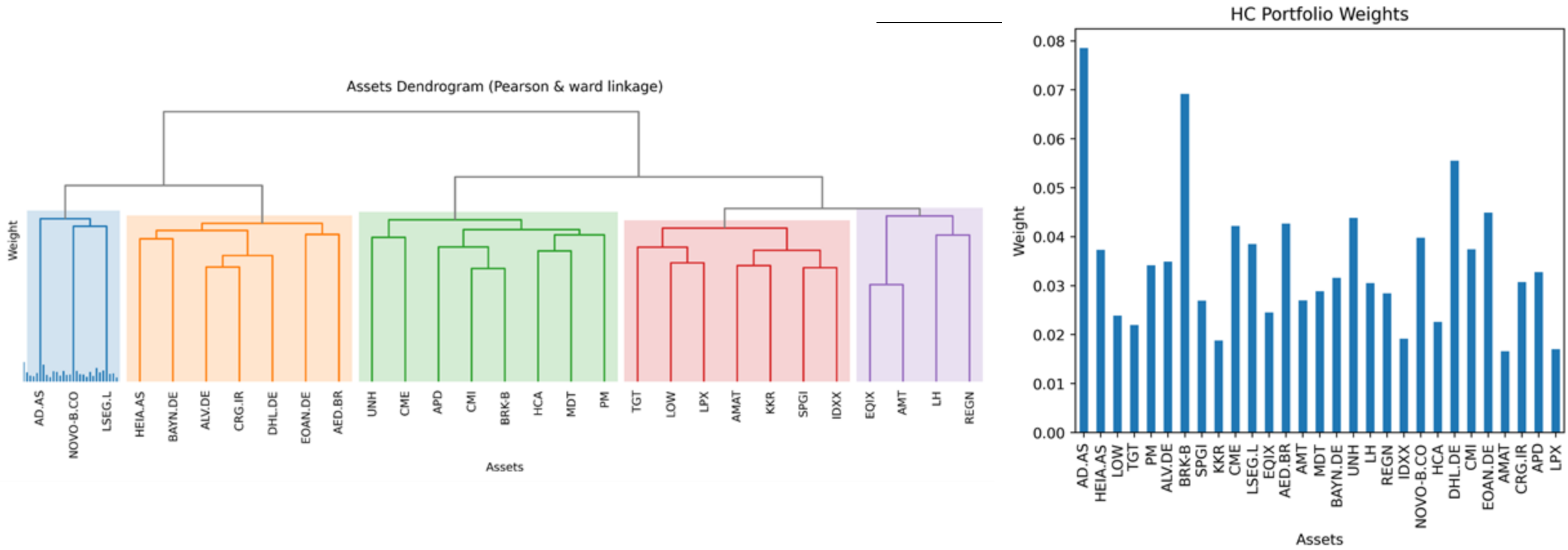
A widely-adopted model in the industry



Hierarchical Clustering (HC) Portfolio



An innovative and advanced model



Value-at-Risk



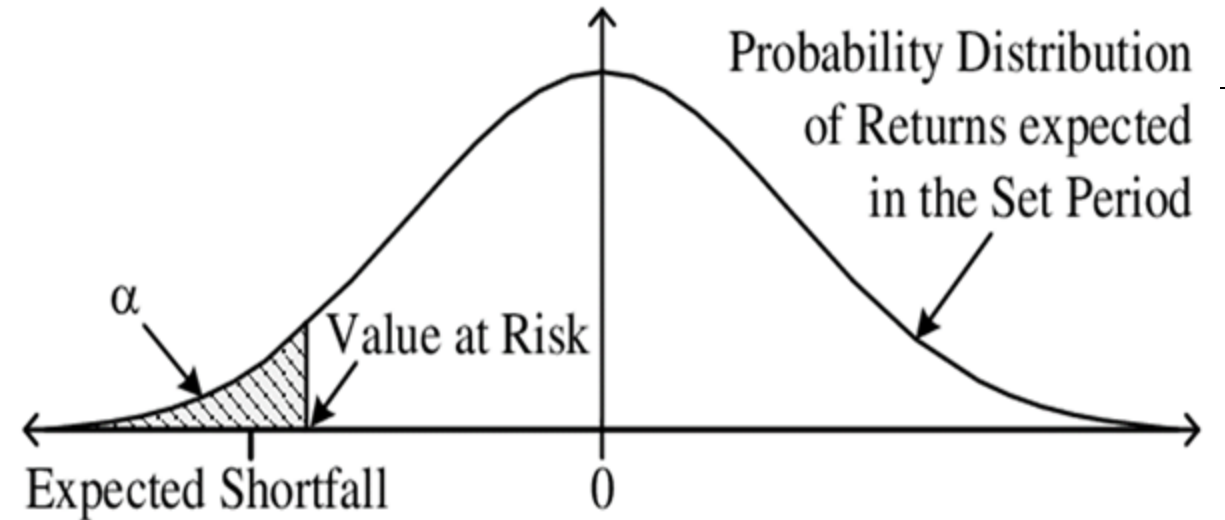
"What is the maximum amount I could lose over a specific period, with a certain level of confidence?"

VaR takes into account:

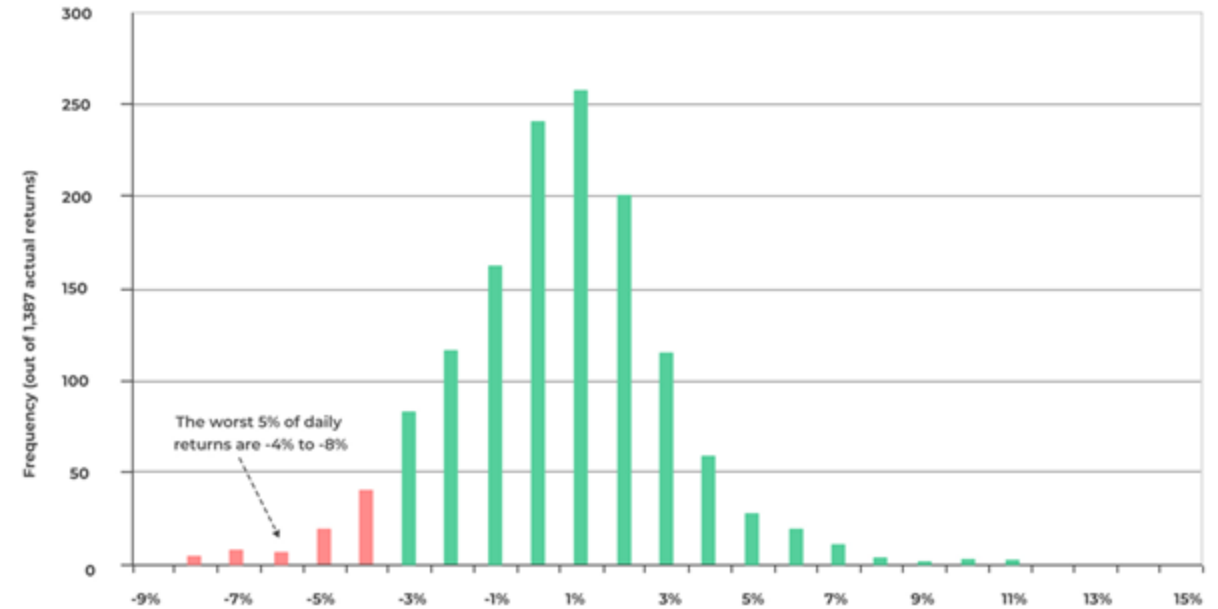
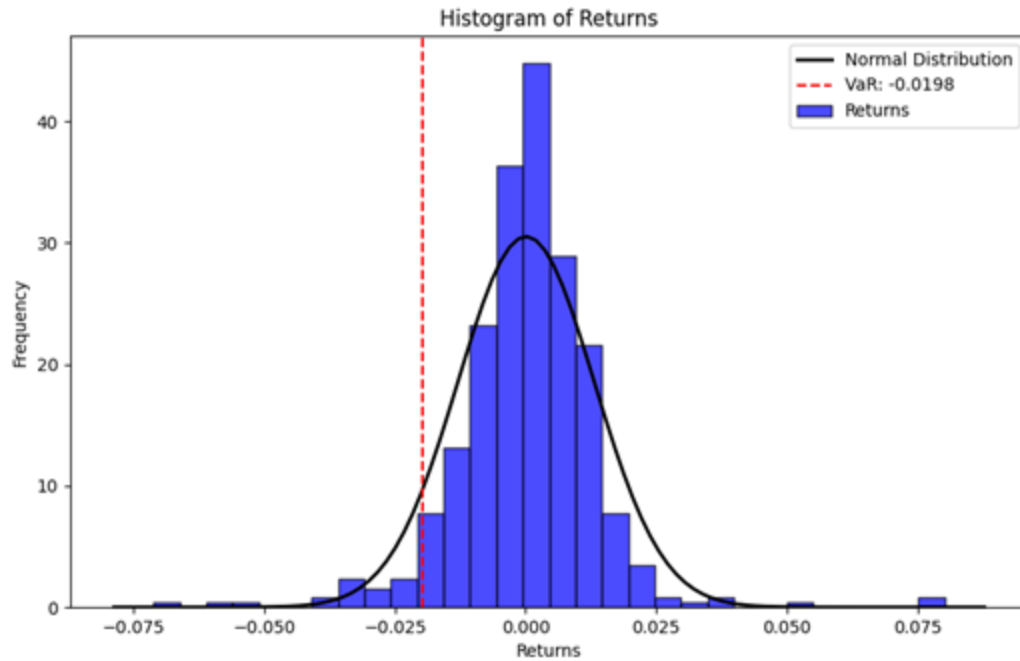
1. Volatility of investments,
2. Historical market data,
3. Probability distribution of potential losses.

Types of VaR used in Sigma's Risk Team:

1. Historical VaR,
2. Gaussian (Parametric) VaR,
3. Marginal and Component VaR,
4. Incremental VaR (IvaR).
5. Expected Shortfall (or Conditional VaR, CVaR)



Historical and Gaussian VaR



	Gaussian (Parametric) VaR	Historical VaR
Definition	Parametric approach to calculate expected losses using approximately normally distributed returns	Non-parametric approach that uses historical data to estimate expected losses.
Methodology	Estimate mean and standard deviation of asset and use: $z\text{-score} \times \text{std} \times \text{mean}$	Calculate returns using historical prices and then select the nth percentile (e.g., 5th percentile for 95% confidence) as VaR, where n corresponds to the chosen confidence level.
Assumptions	Assumes normality of returns.	Relies on market data and can be sensitive to historical anomalies

Expected Shortfall

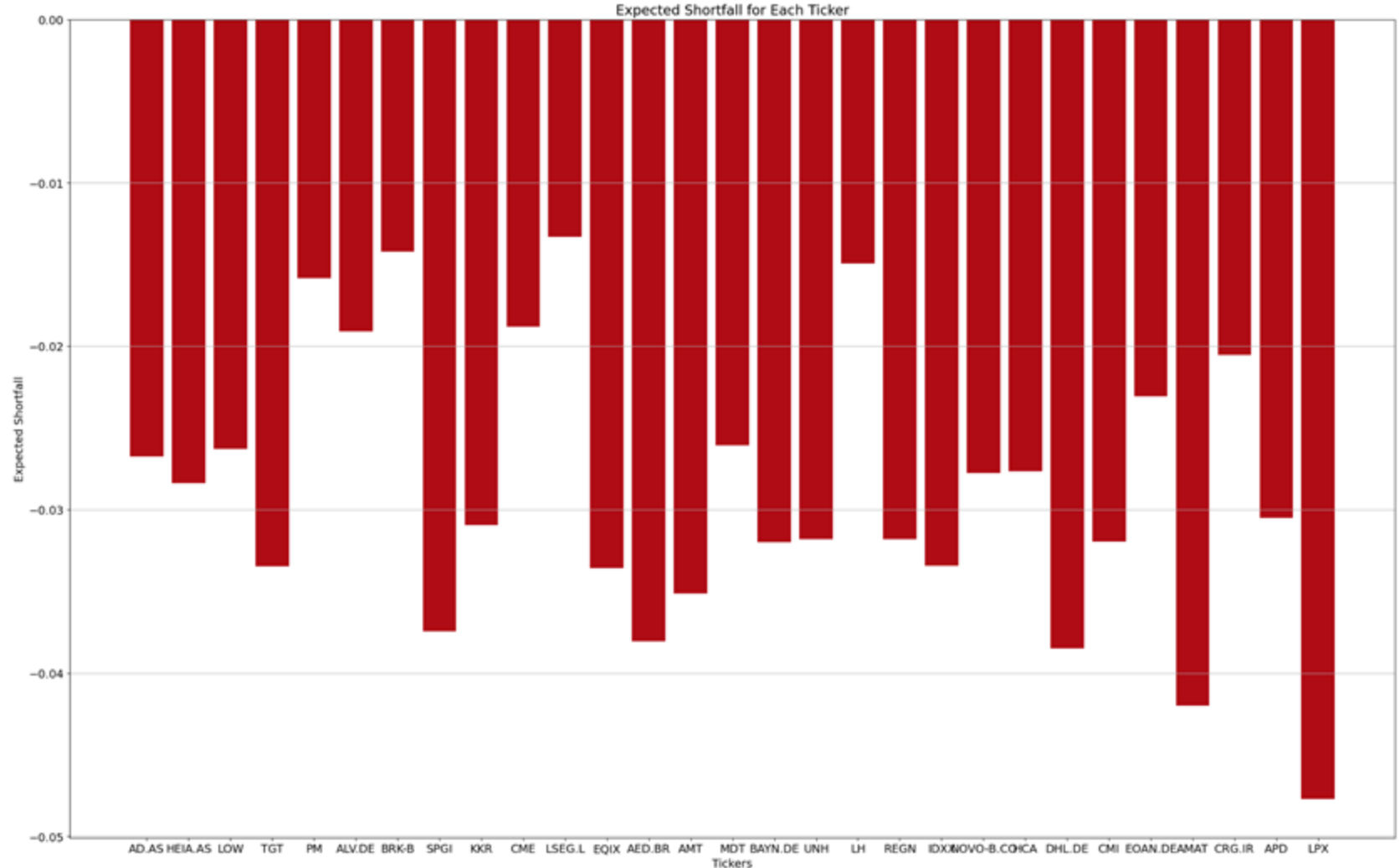


Expected Shortfall (ES) is the negative of the expected value of the tail beyond the VaR

More comprehensive view of potential losses beyond VaR. Insight into the severity of extreme outcomes.

Interpretation:

1. Average Loss Beyond VaR,
2. Severity of Extreme Losses,
3. Risk Management and Decision Making,
4. Comparison and Analysis.



Marginal and Component VaR



Your running security amongst the unpredictability of the floor.

Component VaR Analysis:

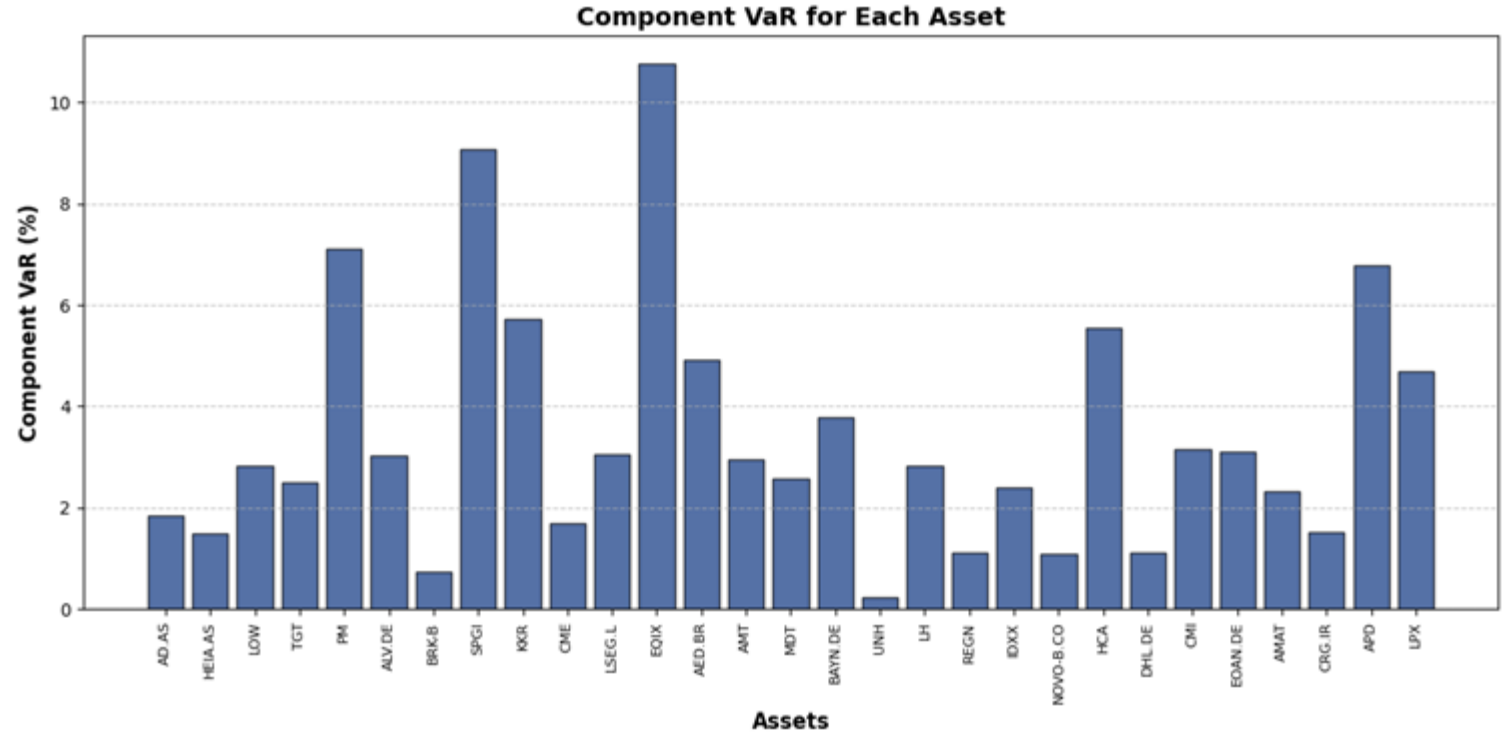
- Decomposes VaR by portfolio components (e.g., assets, sectors).

•Risk Management Insights:

- Identifies key risk contributors, enhancing risk management.

•Diversification Benefits:

- Compares VaR of diversified vs. undiversified portfolios, evidencing Sigma's risk diversification success.



Ticker	Component VaR (%)
Diversified Portfolio	288.0777845537489
Undiversified Portfolio	602.2107995872481

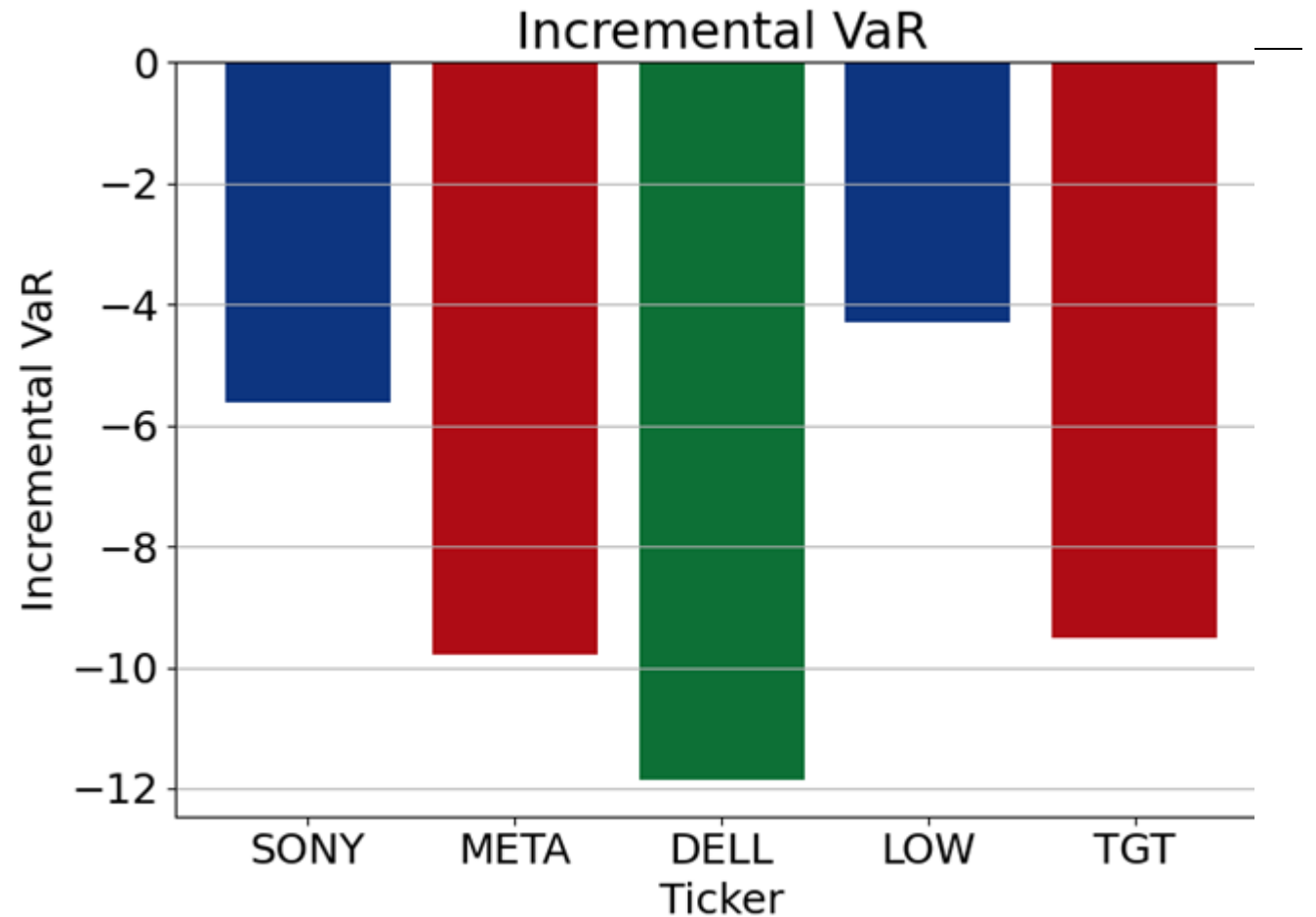
Incremental VaR



Somehow, we love to settle for the analytical solutions allowing us to “see a less attractive girl” – more attractive.

Incremental VaR:

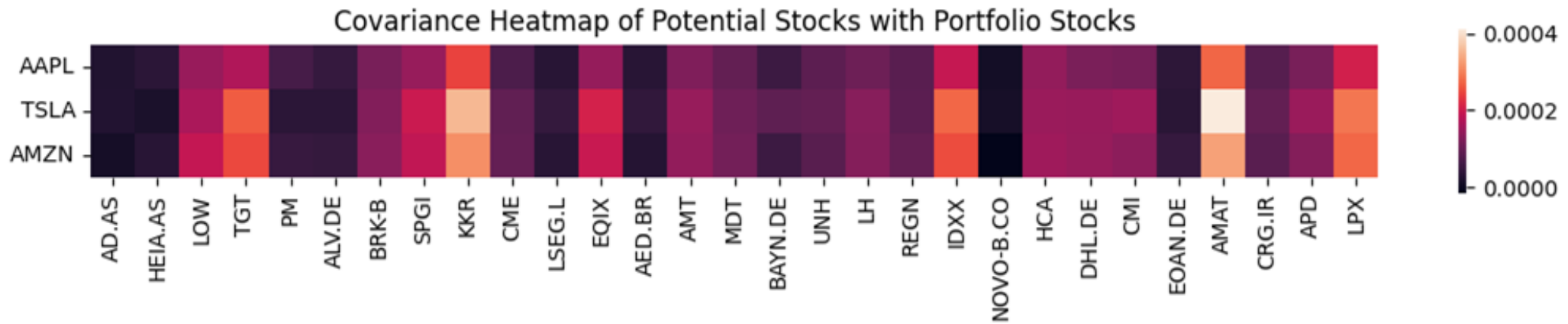
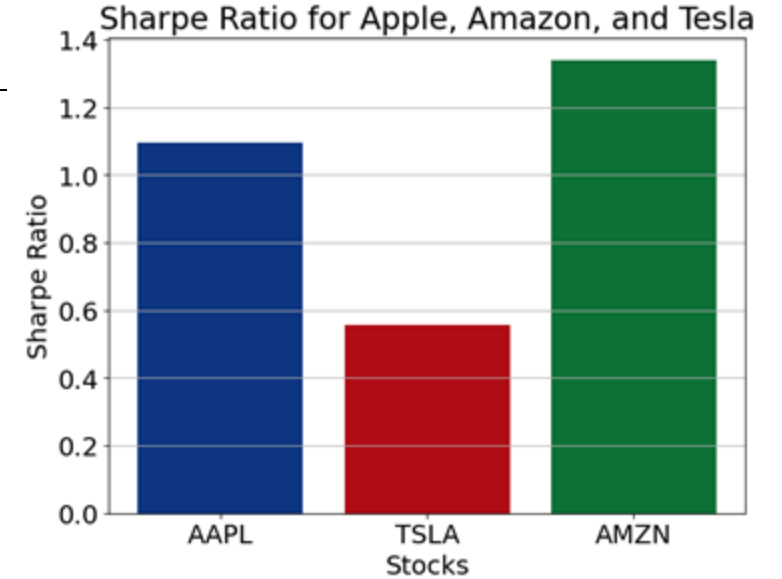
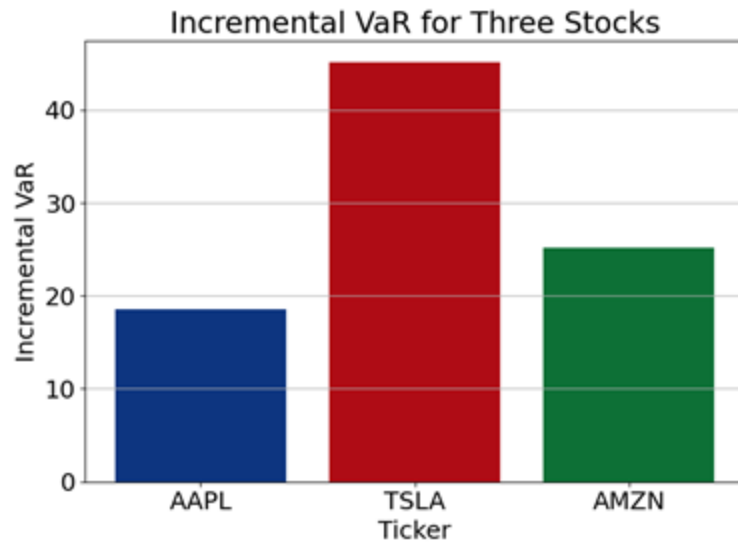
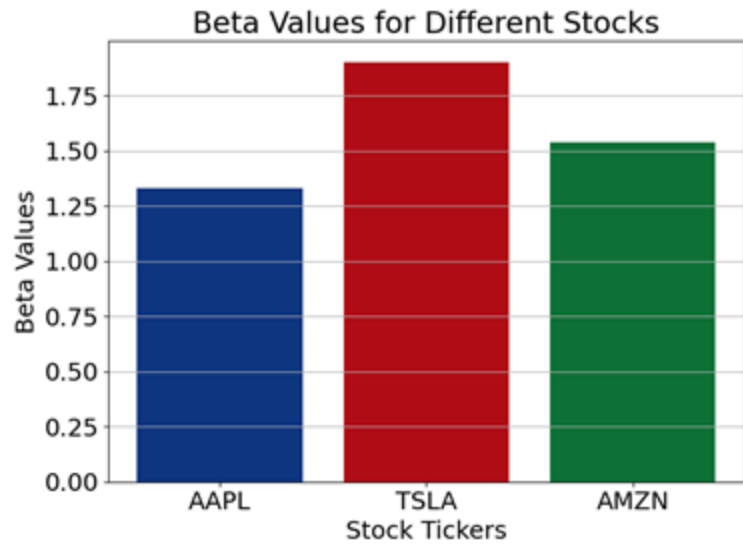
- Reflects how the addition of a certain stock affects the value at risk of the portfolio,
- Useful for deciding whether to add a certain asset to the portfolio,
- Also useful when deciding which asset should be removed from the portfolio.

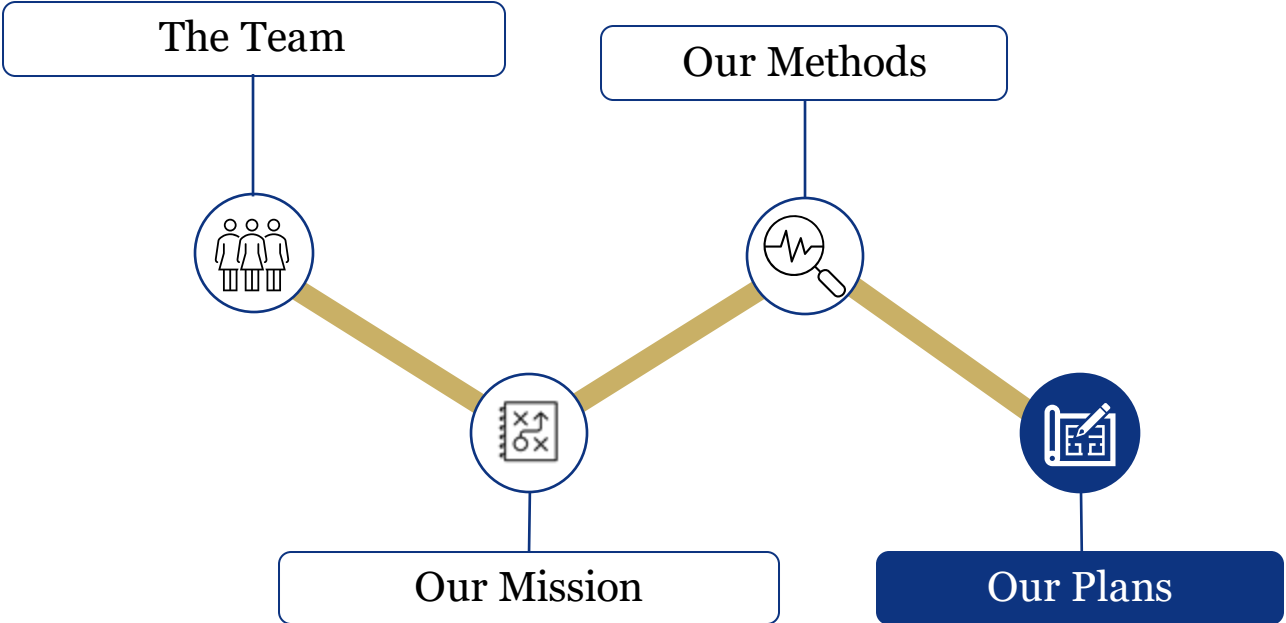


Pitch Evaluation



Compare stocks before further analysis





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Future Prospects

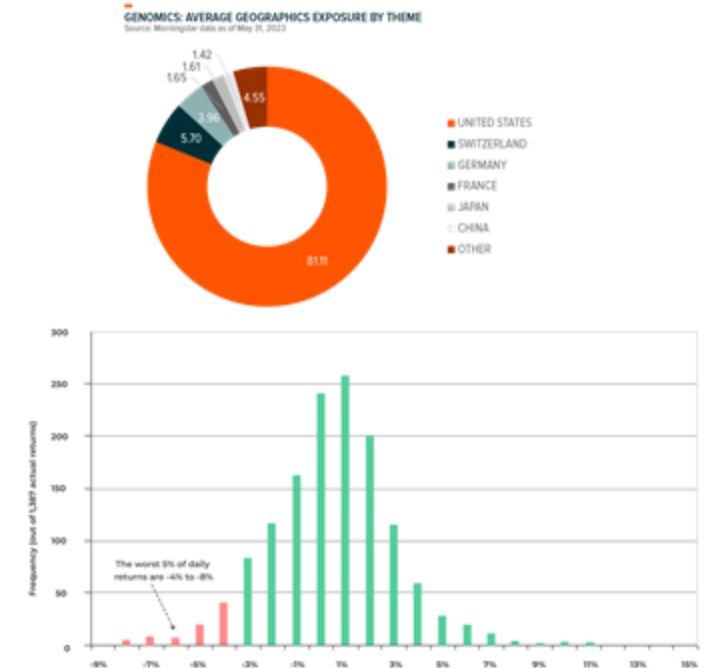
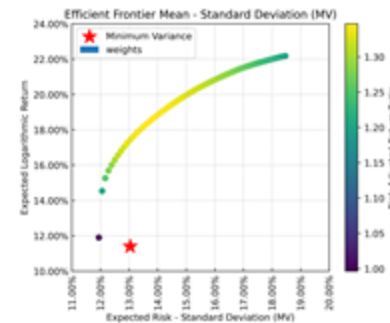


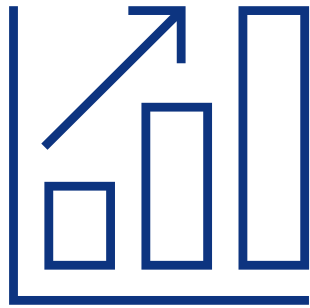
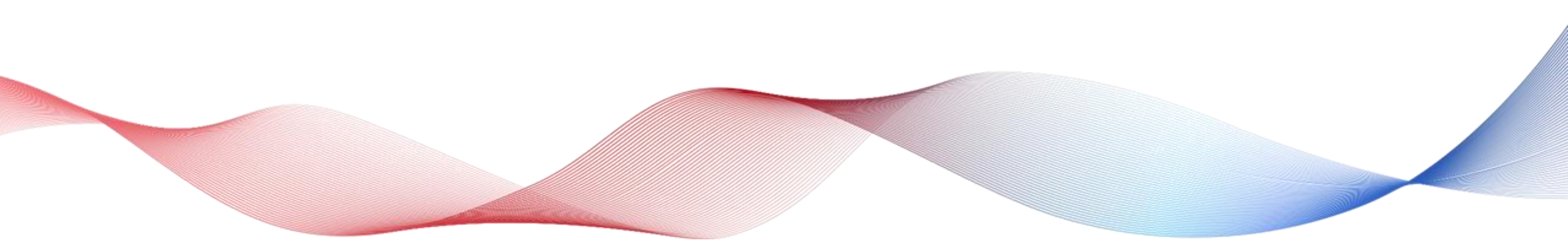
We aim to add more metrics and summarize them in one easy to access document

Add new metrics

Summary Document

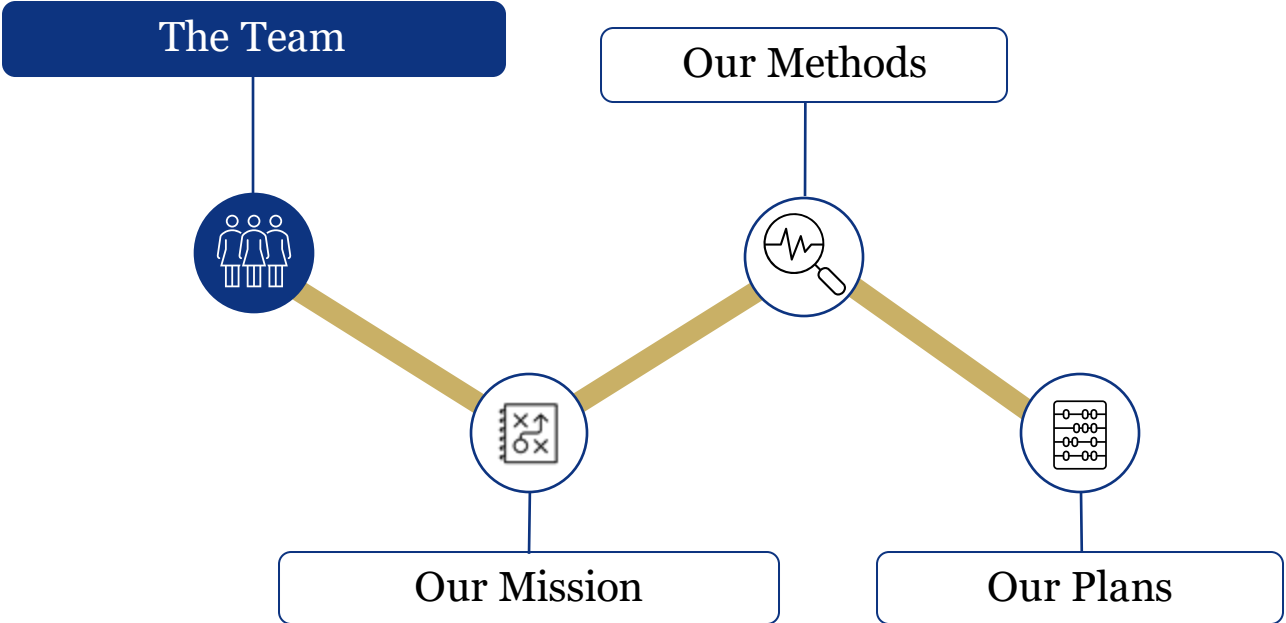
1. **DCF model in Python**
⇒ Faster stock analysis
2. **Jump-Diffusion model**
⇒ More accurate predictions about future jumps
3. **Refining VaR estimations**
⇒ More detailed risk assessment
4. **Geographic and currency exposure**





Technical Analysis

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The Team



- Riccardo Supino
- Senior Analyst
- Technical Analysis



- Dario Saveriano
- Junior Analyst
- Technical Analysis



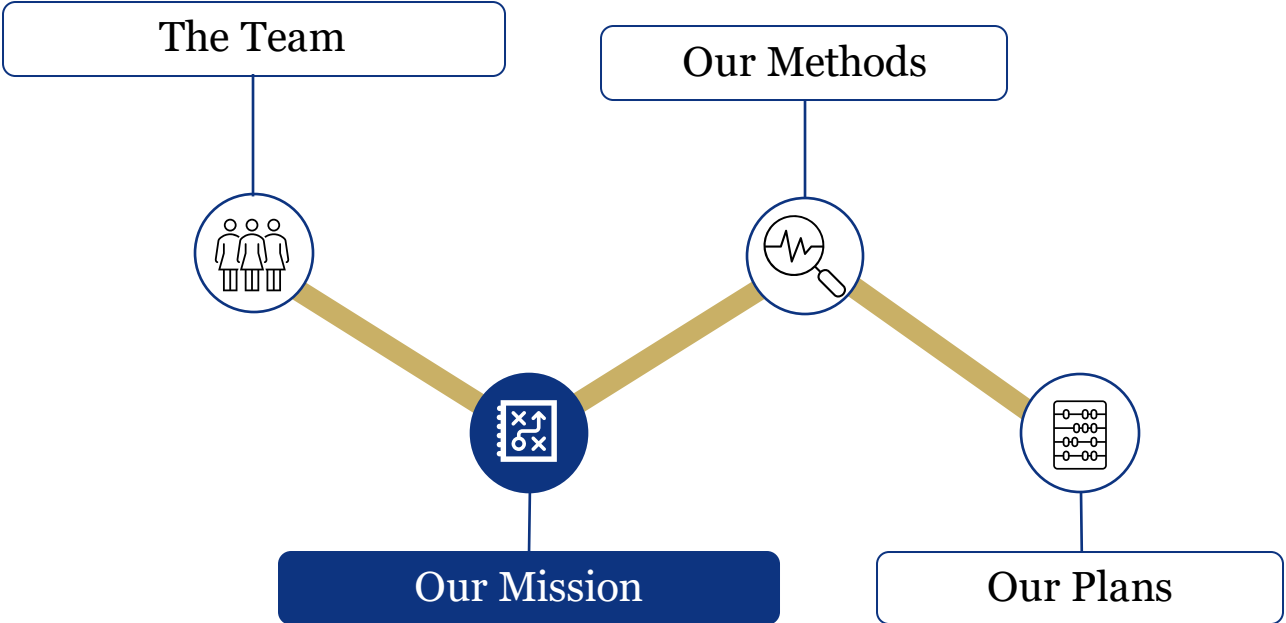
- Jordi Llompart
- Junior Analyst
- Technical Analysis



- Nicholas Friedrich
- Junior Analyst
- Quantitative & Machine Learning



- Maja Swietochowska
- Junior Analyst
- Statistics & R studio



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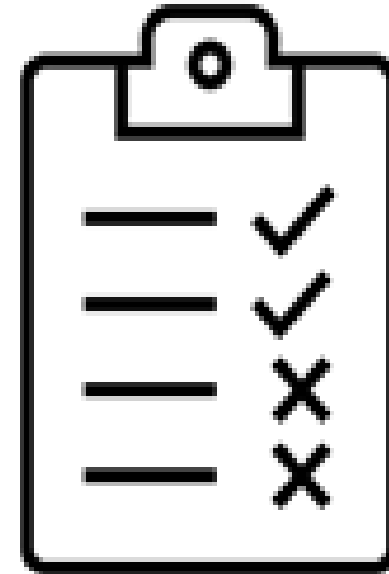
The Mission

Optimizing entry & exit positions



We analyze various indicators to paint a story

- We are **not** predicting the market
- Analysing market sentiment and technical indicators
- Work closely with industry teams & fund analyst team
- Incorporate Market sentiment & event news
- Constantly monitoring open positions in the fund portfolio
- Monthly reports



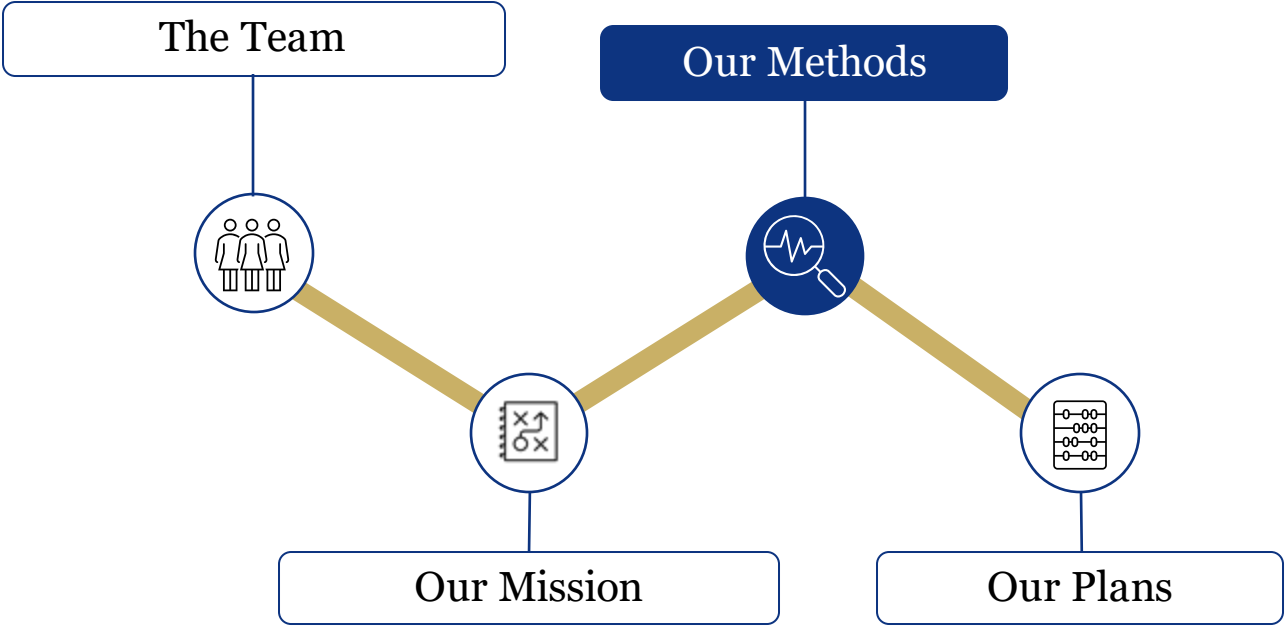


Why Technical Analysis works

Market Psychology

- Price Patterns that tend to repeat themselves.
 - Especially as more people trade using Technical Analysis.
 - Reflect underlying human psychology in trading decisions.
- Markets can hint at direction of next movement
- Mathematical indicators can portray characteristics of stock price movement





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Methodology

A Multifaceted Approach to Market Analysis



We use a variety of techniques in our analysis:

- Technical Indicators
- Non-Visual Indicators
- Statistical Models
- Market Sentiment Analysis



Support & Resistance Channels



Analyzing the general direction

- **Support:** Price level at which a market or stock historically stops falling
- **Resistance:** Price level at which a market or stock historically struggles to surpass
- **Channels:** Represent the boundaries of a price range, showing trend direction
- Establish breakout points in the channels
- They can be influenced by psychological and historical factors



Moving Average Convergence/Divergence (MACD) Σ

A trend-following momentum indicator used to identify changes in direction of a trend

- MACD line
- Signal line
- MACD histogram
- A crossover of the MACD line above/below the signal line is often considered a buy/Sell signal.
- Divergence can be a warning sign that a trend is about to reverse.





Relative Strength Indicator (RSI)

A momentum oscillator measuring price movement speed and overbought/oversold conditions

- Identifying reversal points.
- Confirming trend strength.
- Spotting divergences between RSI and prices
- Divergence signals weakening trend.
- Steep/persistent RSI values indicate trend strength.





Directional Movement Index (DMI)

A trend-following indicator gauging the strength & direction of potential trend reversals

- When there is not a visible trend
- Whichever DI is on top is the current direction of the trend
- A higher ADX shows a stronger trend
- -DI and +DI cross over with an upwards sloping ADX



Coppock Curve



10 WMA of (ROC14 + ROC11)

- Long term momentum
- Above 0 indicates positive momentum
- Below 0 indicates negative momentum
- Indicates strength of momentum too



Fibonacci Retracements

A tool for spotting key support and resistance levels using Fibonacci ratios

- Shows the potential most important level
- Highlight potential entry points
- Based on Fibonacci ratios (23,6%;38,2%;61,8%....)



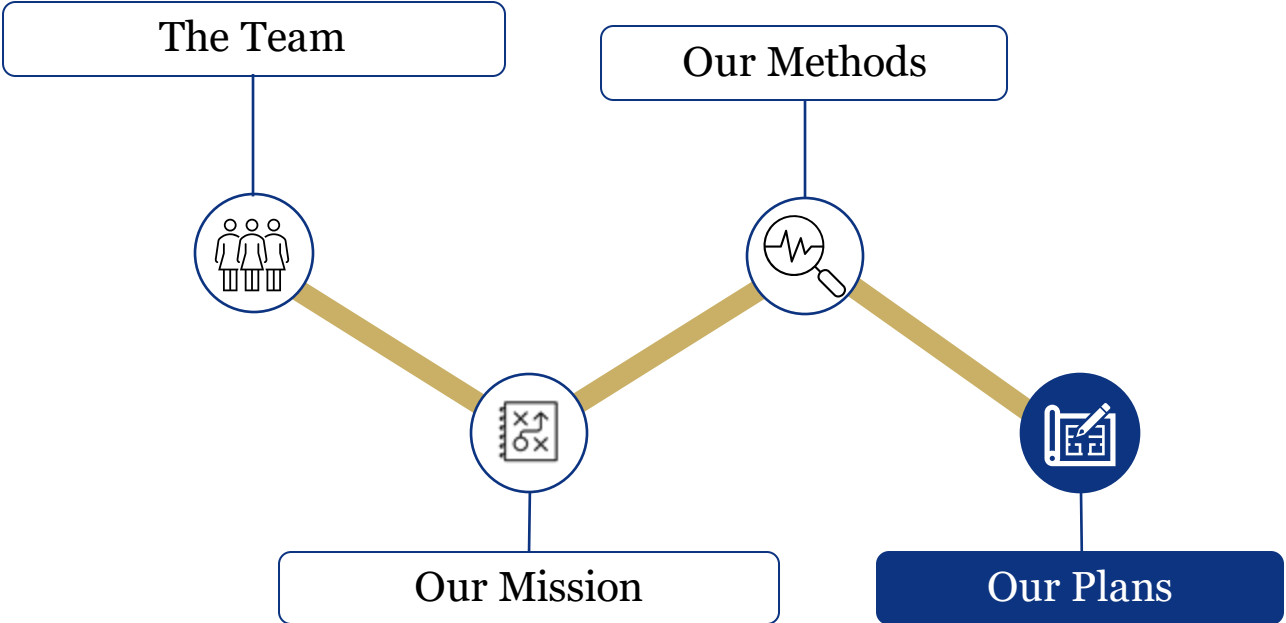
Non-Visual Indicators



Another view at the same problem

- Put/call ratio
- Short interest ratio
- Volume Weighted Average Price (VWAP)
- Advance-Decline ratio





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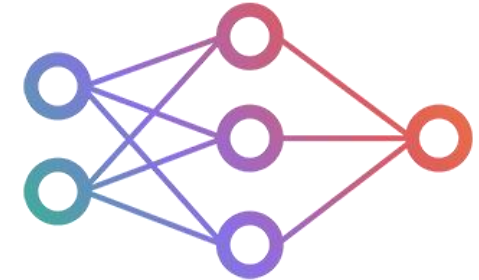
Future Projects

Machine Learning, Modeling & Statistics



We have several exciting plans in the pipeline

- Neural Network for time series prediction
- News headlines for sentiment analysis
- Bayesian Econometrics (Markov chain)
- Random Forest Classifier



Neural Network for Time Series Prediction



META has created the framework for a model

- Deep learning technique – non-parametric
- Uses autoregressive integrated moving averages (ARIMA)
- Interesting for analysing trends
- Certain assumptions have to be met – explore further



News headlines for sentiment analysis

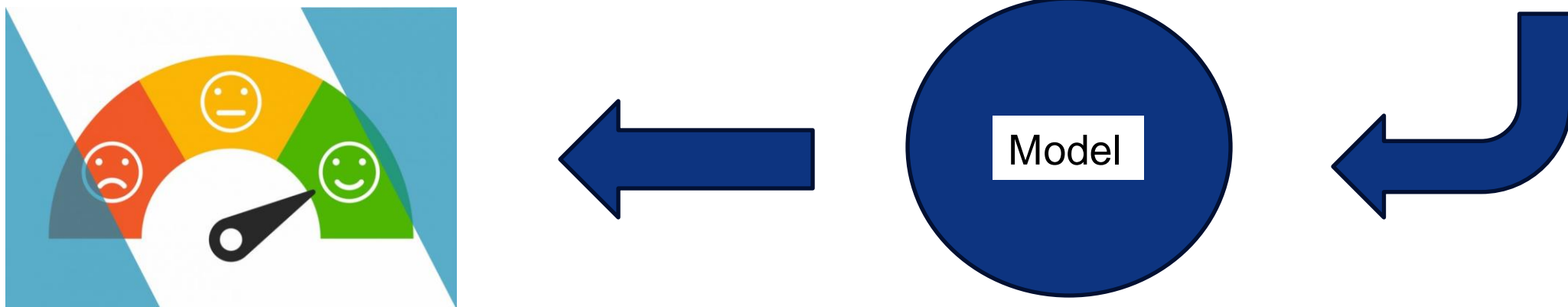


Sentiment analysis

- News headlines act as data
- Sentiment models can score the headline (Positive or Negative)
- The market sentiment score for a stock can be calculated
- Decide on scoring method
- Include other input sources

Nvidia is on its way to becoming the first \$2-trillion chipmaker

The AI chipmaker's stock soared to a record high after earnings and then continued climbing

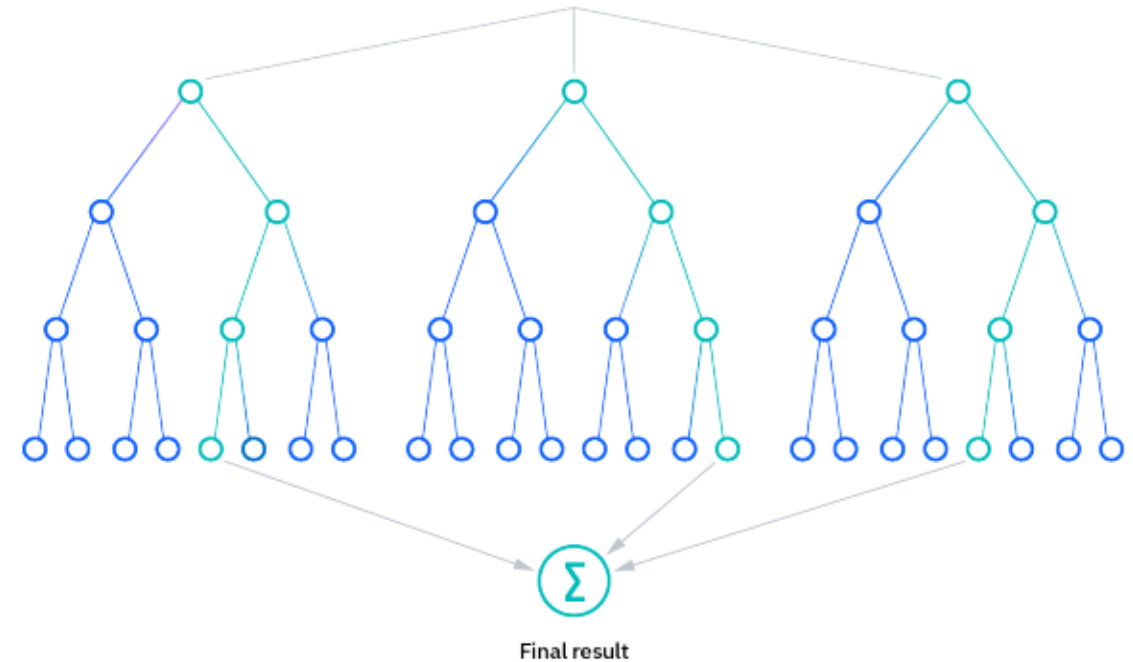


Random Forest Classifier



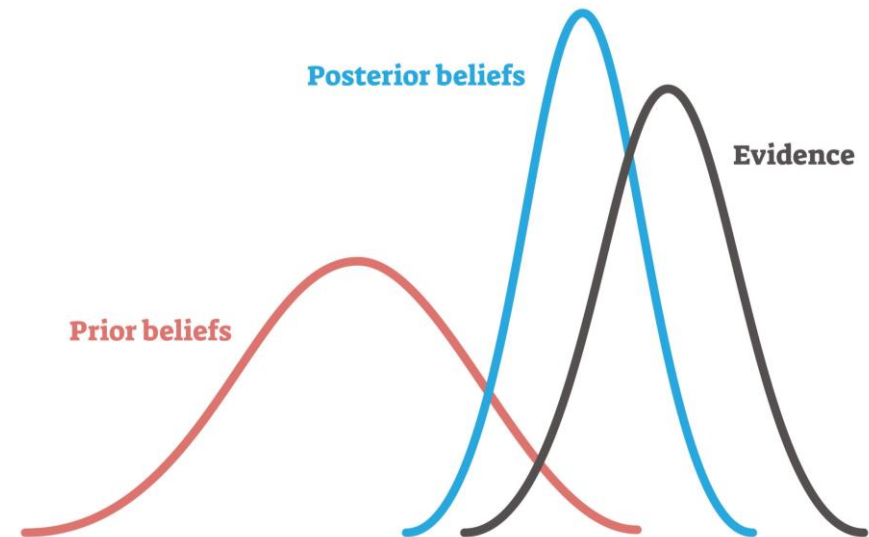
Machine Learning for Stock Return

- Model to identify a high performer stock based on its current fundamentals
- Random Forest Classifier trained on this data
- Produces a Random Forest Score for a stock, indicating the probability that it is a high performer



Investigating turning points

- Logistic regression with time series data
- Prior beliefs (expectations)
- Hamiltonian Monte Carlo
- NUTS (No-U-Turn Sampler) algorithm
- Burn-in period equal to 0.25 or 0.5 number of iterations for each chain





Sustainability

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The Team



- Yves Baljet
- MSc Sustainable Finance
- Senior Analyst



- Hannes Steinhoff
- BSc International Business
- Junior Analyst

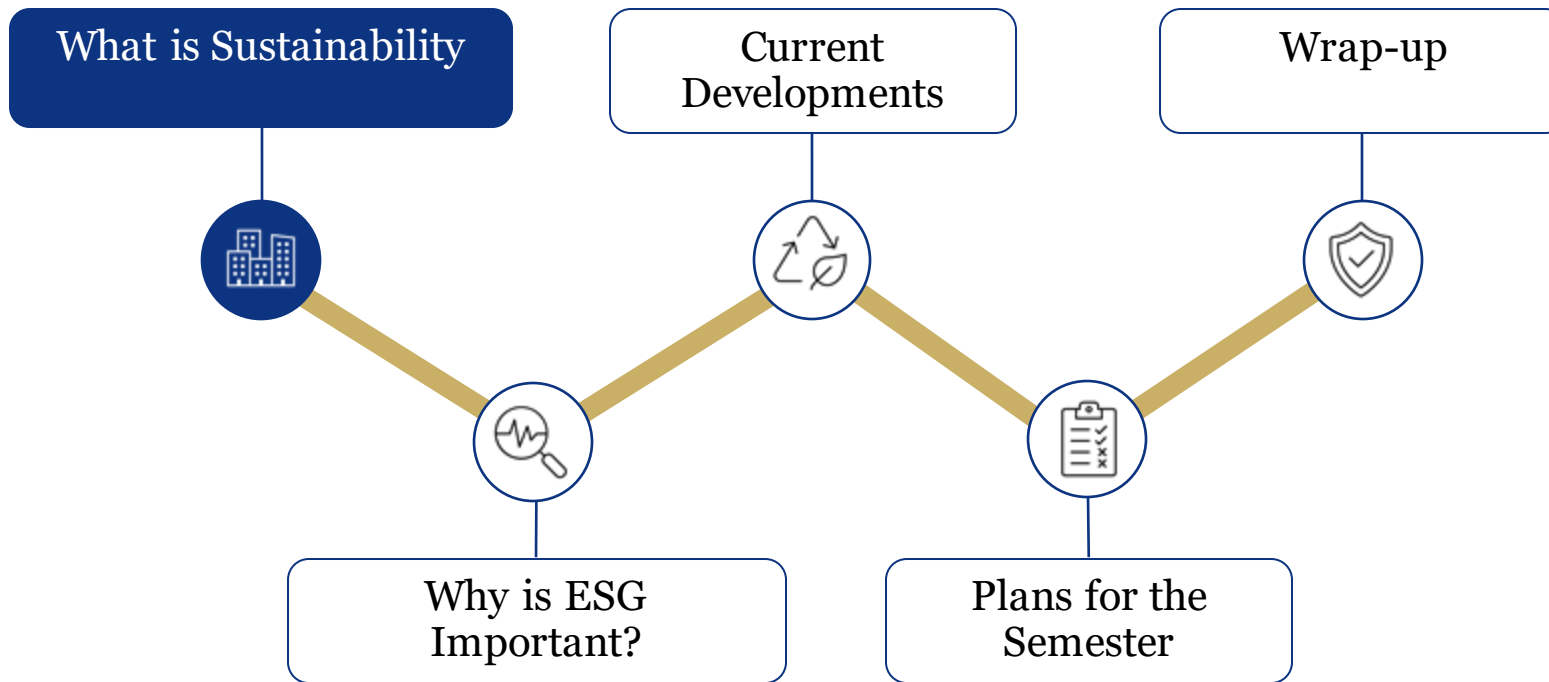


- Vadim Baliakin
- BSc Business Engineering
- Junior Analyst



- Matthias Sciollintano
- MSc Corporate Finance
- Junior Analyst





What is Sustainability



What are the ESG implications for Sigma

Definition and Objectives

- Balancing economic, environmental, and social needs without compromising future generations.
- Preserve natural resources and maintain ecological balance.
- Key to identifying risks and opportunities affecting long-term returns.
- Integrates ethical, environmental, and social considerations into investment decisions.

Materiality

- Identifies ESG issues most likely to impact financial performance.
- Helps investors focus on critical sustainability factors.
- Ensures investments align with long-term value creation.

ESG

- **Environmental:** Climate change, resource depletion, waste management, and pollution.
- **Social:** Labor practices, human rights, community impact, and customer satisfaction.
- **Governance:** Board diversity, executive pay, ethics, and transparency.
- Help identify potential risks and opportunities.

Positive Vs. Negative Screening



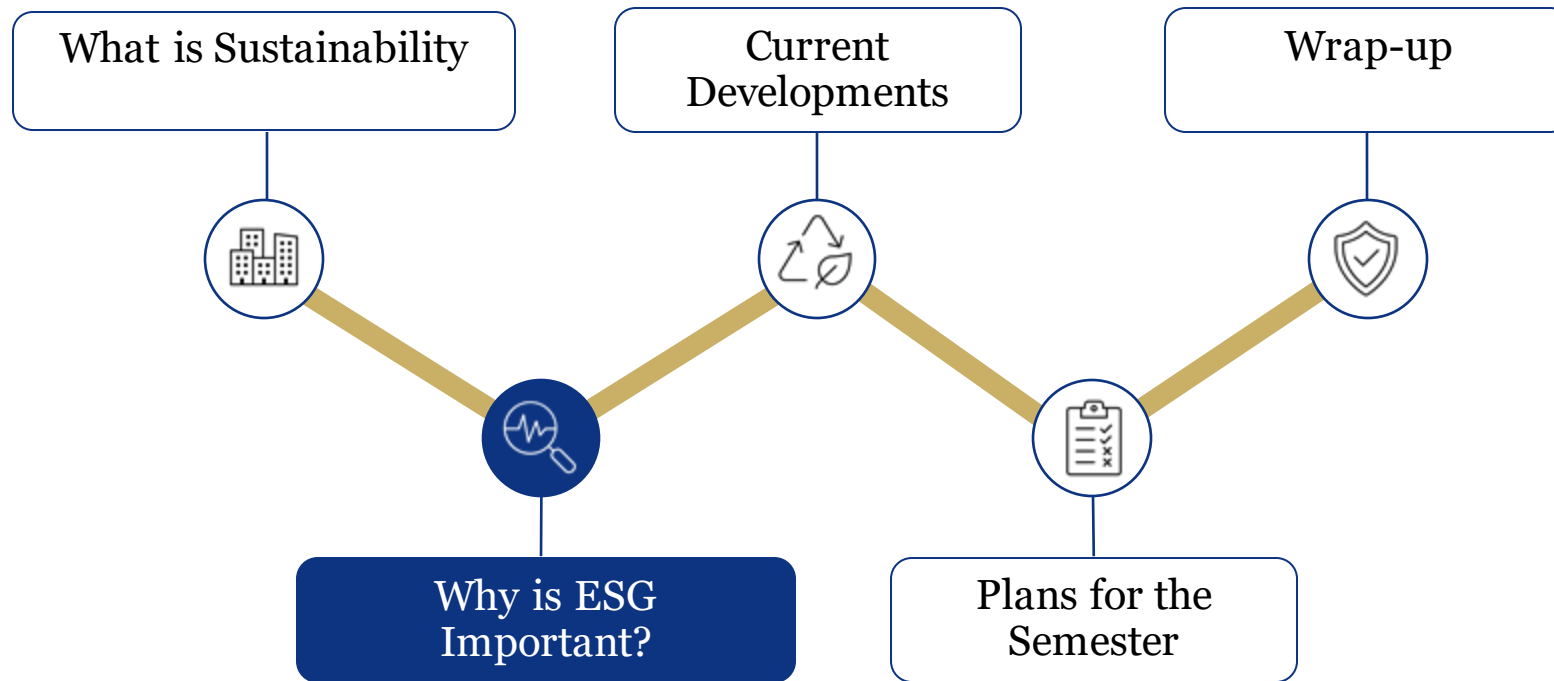
What are ESG implications for Sigma

Screening Objectives

- Filters investments based on ESG criteria.
- Includes firms with strong ESG practices or sectors
- Excludes companies or sectors with negative impacts on society or environment (e.g., fossil fuels, tobacco).
- Shapes investment choices, aligning with ethical and sustainability goals.
- Enhances long-term returns by avoiding companies with high ESG risks.

Implications for Sigma

- Aligns fund with future-oriented, responsible investment strategies.
- **Positive Screening:** Leads to investments in innovative and sustainable industries, potentially increasing long-term returns.
- **Negative Screening:** Mitigates risks by avoiding investments in controversial sectors or companies with poor ESG performances.
- Builds the fund's reputation as an ethical and socially responsible investor.



Risks & Opportunities of ESG investing



Risks

ESG risks are social, environmental, and governance factors that have an impact on the financial success and management of a company.

E

- Climate change
- Biodiversity
- Fresh water
- Pollution, waste management
- Hazardous materials

S

- Human rights
- Labour rights and working conditions
- Community relations

G

- Corruption
- Board composition
- Compensation to senior management

Risks & Opportunities of ESG investing



Opportunities

ESG opportunities are benefits which a company gains in case of caring about its ESG risks.

Financial and Operational Benefits

- Reduced Operational Costs
- Improved Financial Performance
- Access to Capital
- Risk Mitigation
- Regulatory Compliance

Strategic and Stakeholder Benefits

- Enhanced Reputation
- Innovation and Market Opportunities
- Employee Engagement and Retention

Example of ESG influence.

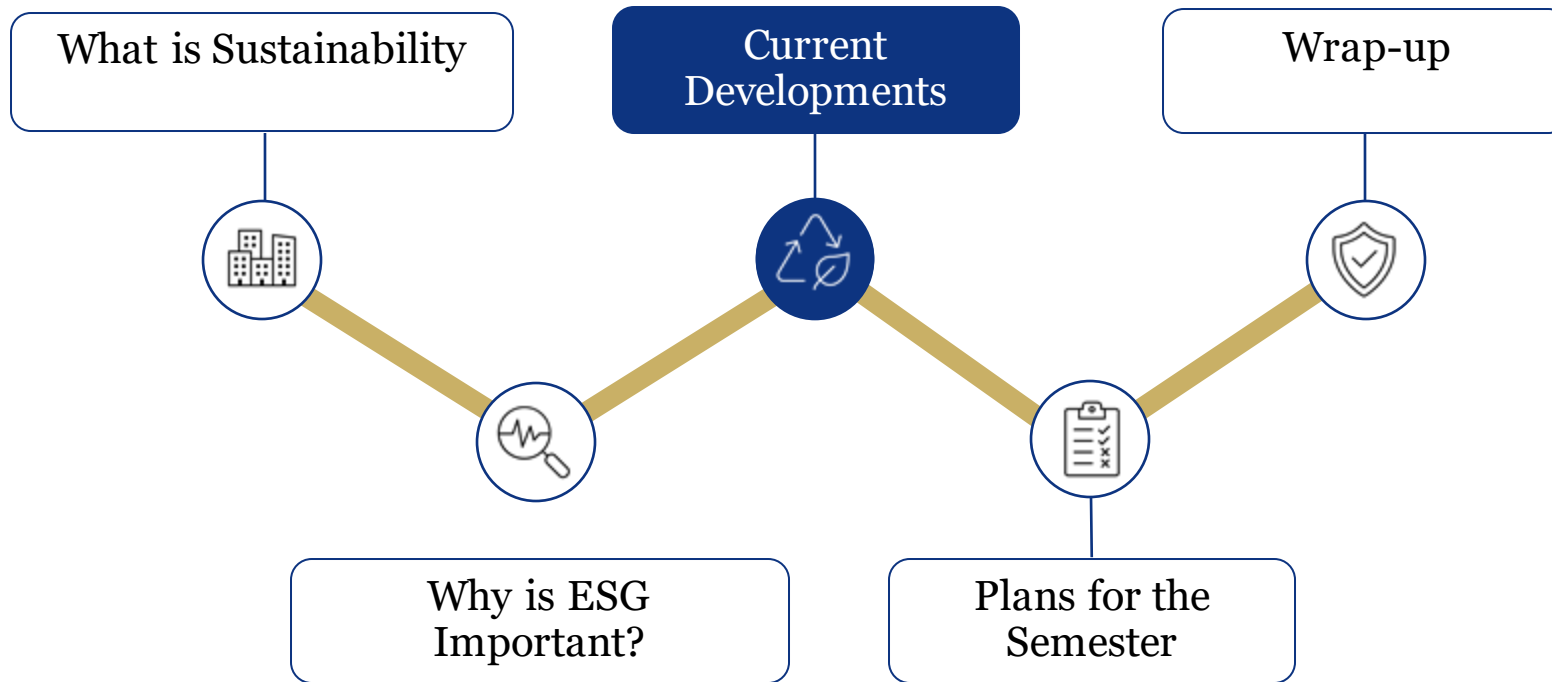


Bayer Monsanto case

Case Description

An ESG risk example from Bayer AG's situation is the extensive litigation surrounding Roundup, alleging its link to cancer. This represents environmental risks due to product safety concerns, social risks impacting public health and affected communities, and governance risks related to legal management and shareholder value protection.



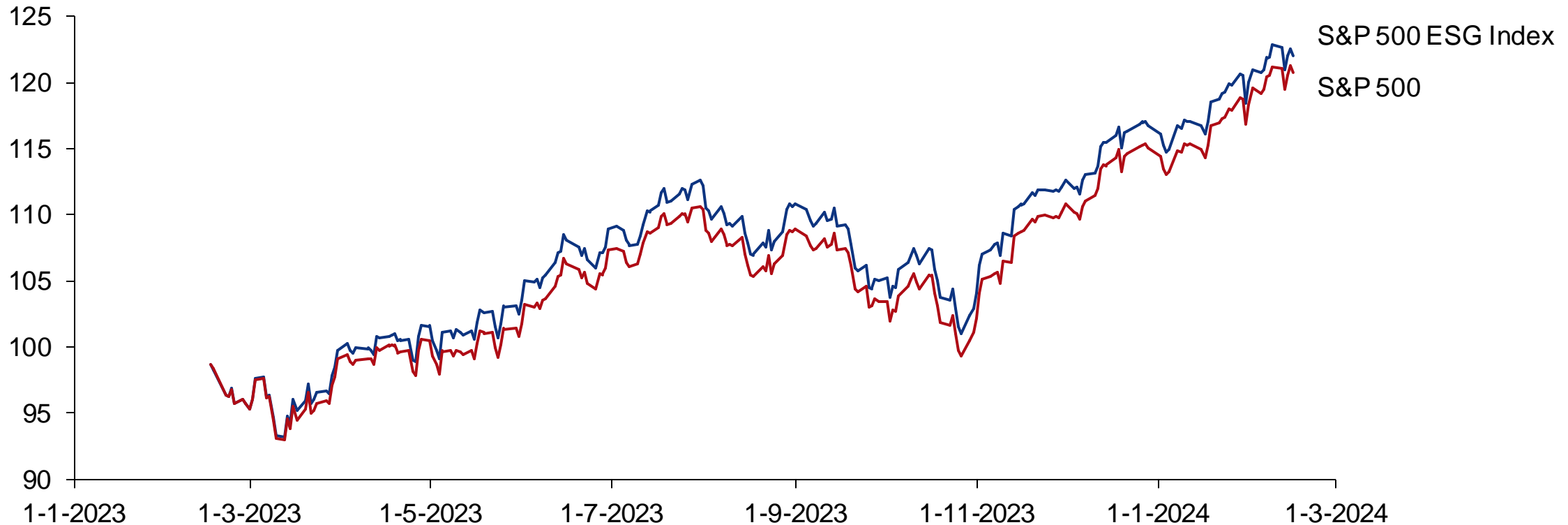


Current Developments in ESG investing



“Green is Good: Wall-Street’s new mantra” ~ Financial Times (2021)

S&P ESG Index outperforming S&P500



Source: Bloomberg

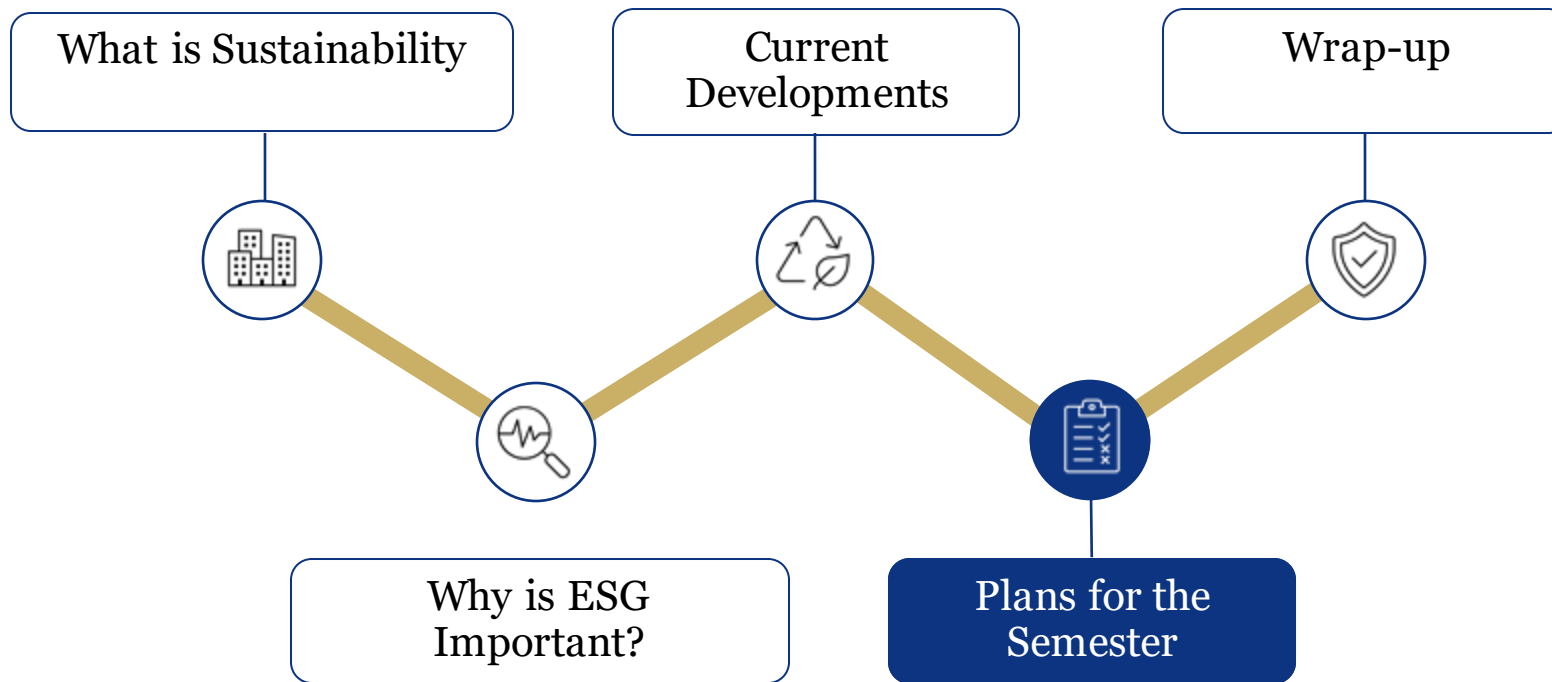
What is happening in 2024

CSRD, Greenwashing, Climate Risks and Supply-Chain Adaptation



Most important topics for this year:

- **ESG backlash**
- **Wait-and-see approach** regarding regulation
- Corporate Sustainability Reporting Directive (**CSRD**) 2024, expanding regulation to more (private) companies
- Increased regulatory action and legislation against **greenwashing**
- **(Physical) Climate Risks** increasingly relevant
- Focus on adaptation and resilience planning
- **Supply-chain adaptation** and integration, measuring Scope 1/2/3 emissions across the supply chain
- Challenges and opportunities related to A.I.



Plan for the semester



How do we integrate sustainability into Sigma

Current Approach

- Complex ESG Engine
- Manual input
- Combining several agency ESG ratings with own estimates
- Numbers, numbers, numbers....
- No useful qualitative information for analysts and Sigma's investors
- Pitches not interesting to listen to

New Approach

Quantitative

- Create new ESG Engine from scratch
- Code from FactSet: automatic and instant monitoring
- Analyze ESG rating of Sigma's Portfolio
- Benchmark investment pitches

Qualitative

- Tell the story behind the numbers
- Provide useful company-specific information regarding scandals, risk, opportunities etc.
- Making pitches meaningful

Example



How would the sustainability look like in practice?

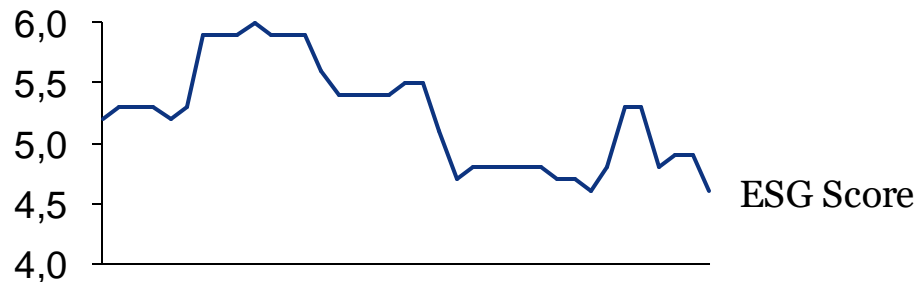
Quantitative

Top 5 ESG Risk Exposures



MSCI ESG Rating

AA (Leader)



Qualitative

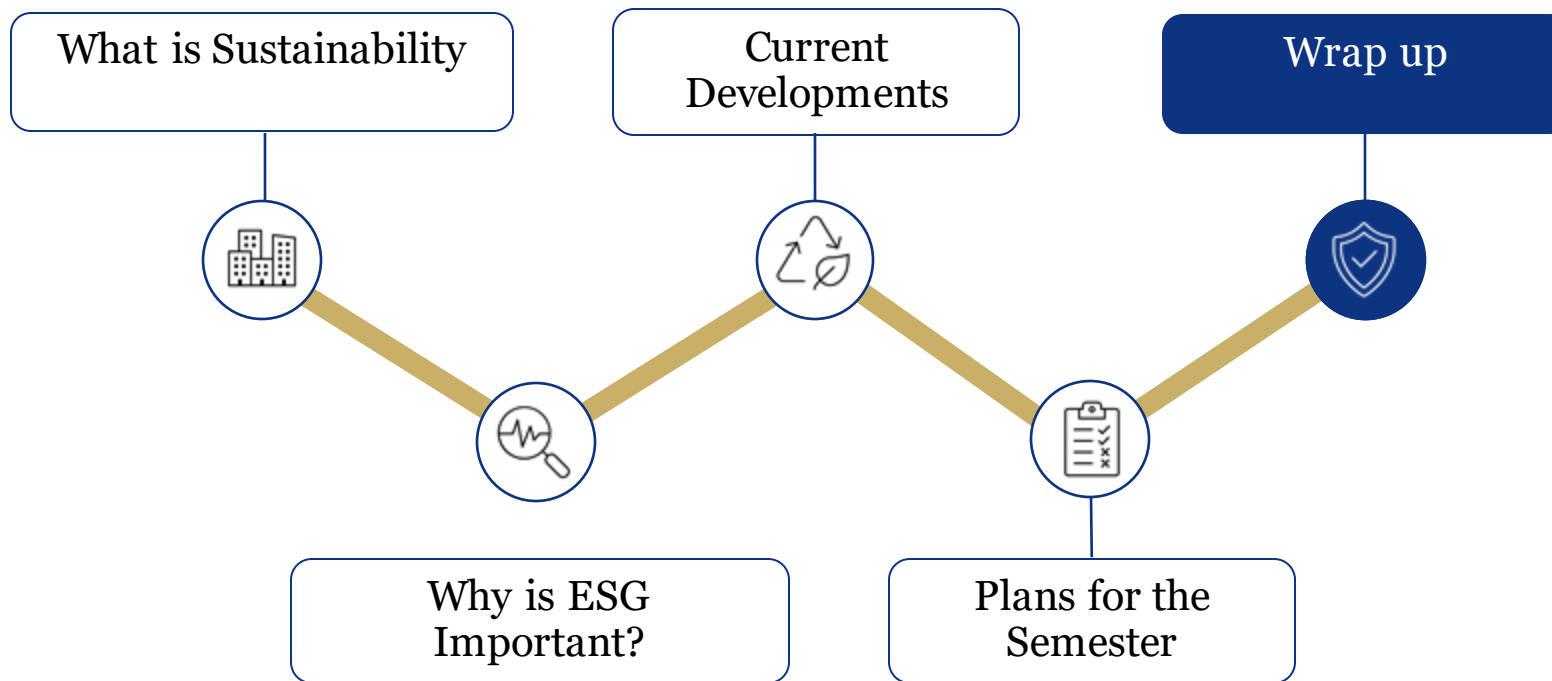
Lufthansa: Planetary protection posturing

An advertising campaign for Lufthansa was banned in the United Kingdom for making misleading claims about the German airline's efforts to protect the planet. Britain's Advertising Standards Authority (ASA) said there were no commercially viable technologies in the aviation industry which would substantiate Lufthansa's claim that it was protecting the world's future.

In its defence, Lufthansa – which has pledged to be carbon neutral by 2050 and half its emissions by 2030 – said the tagline was "open to interpretation" and argued that consumers would not see it as an "absolute promise" to protect the planet or that its planes did not cause harm. The ASA said brands in high carbon emitting sectors shouldn't make claims that give consumers a false impression about plans they can't substantiate.

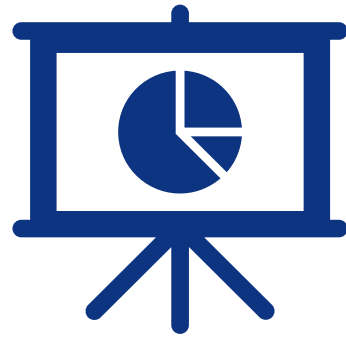


Source: Eco-Business



We need your input!





Fund Administration

Σigma
Investments



**Operations
&
Investor Relations**

Restructuring

New Portfolio Dashboard and ESG Engine



Portfolio Dashboard

- Total clean up
 - ❖ FactSet and Bing integration
 - ❖ Metrics sheet
 - ❖ Budget Plan
- + Report integration**

ESG Engine

- Mix of hardcoded and manual inputs
- ❖ Inefficient
 - ❖ Unintelligible
- Revamp engine

Global Fund Approach



Reporting

Monthly fund and macro report for communication



Content

- I. Introduction
- II. Fund Developments
- III. Portfolio Deep Dive
- IV. Macro Update
- V. Appendix → ESG, Risk & TA

Visuals

- ❖ Fund performance
- ❖ Risk Report
- ❖ Portfolio characteristics
- ❖ TA analysis

Medium

- ❖ Website
- ❖ Email
- ❖ LinkedIn

MARCH 2024

INTRODUCTION

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book.

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DEVELOPMENTS

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YTD

TABLE of characteristics

Portfolio characteristics (Count of positions und Return)

Table buying price, selling price, pitch price

PAGE 2

MARCH 2024

DEEP-DIVE

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MACRO-UPDATE

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KEY-NEWS

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PAGE 3

Voting



Overhaul voting system to increase investment attractiveness within the fund

Current System

- ❖ €500 Minimum Buy-in
- ❖ 1 vote per share capped at 3 votes
- ❖ No payout Restrictions

Objective



- I. Boost the appeal of investing for students
- II. Establish an efficient voting system to secure higher voter participation

Marginal Approach

- ❖ Allows students to invest in increments of €100.
- ❖ Each €100 investment grants one vote, up to a maximum of 15 votes.
- ❖ < €300 invested capital
→ 18 month holding period

Tier System

- Tier I**
€500 - 2 Votes
No minimum holding period
- Tier II**
€250 - 1 Vote
Minimum holding period: 1 year
- Tier III**
€100 - no voting rights
Minimum holding period: 2 years

Open Discussion



Do they address the problem? Are they feasible? What are the risks? And what are the alternatives?

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Attendance and Feedback!



Attendance



Feedback

