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Global Markets Division

Searching α

Tracking Google Trends

Return: 93,84%

Investment Horizon: June 2023 – November 2024

Bauer, Debs, Lőkös, Świętochowska, Mukhamejan, Hohendanner
Vienna, June 25th

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Team Overview

Global Markets



**Laurent
Bauer**

Team Lead

- Storyline
- Equities
- Portfolio



**Zouher
Debs**

**Senior
Associate**

- S&P 500



**Flóra
Lőkös**

Analyst

- Literature Research
- Equities



**Maja
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Fellow Analyst

- Quantitative Analysis



**Zhangir
Mukhamejan**

Fellow Analyst

- Literature Research
- Equities



**Dominik
Hohendanner**

Fellow Analyst

- S&P500
- Equities



MSc. Finance &
Accounting (WU)
– 2nd Semester



BSc. BBE (WU)
– 4th Semester



BSc. BBE (WU)
– 2nd Semester



MSc. Quantitative
Finance (WU) - 2nd
Semester



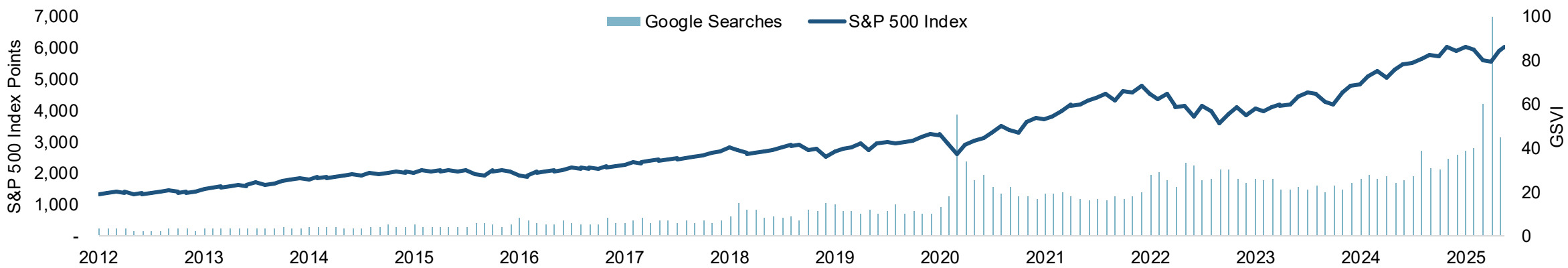
BSc. BBE (WU)
– 2nd Semester



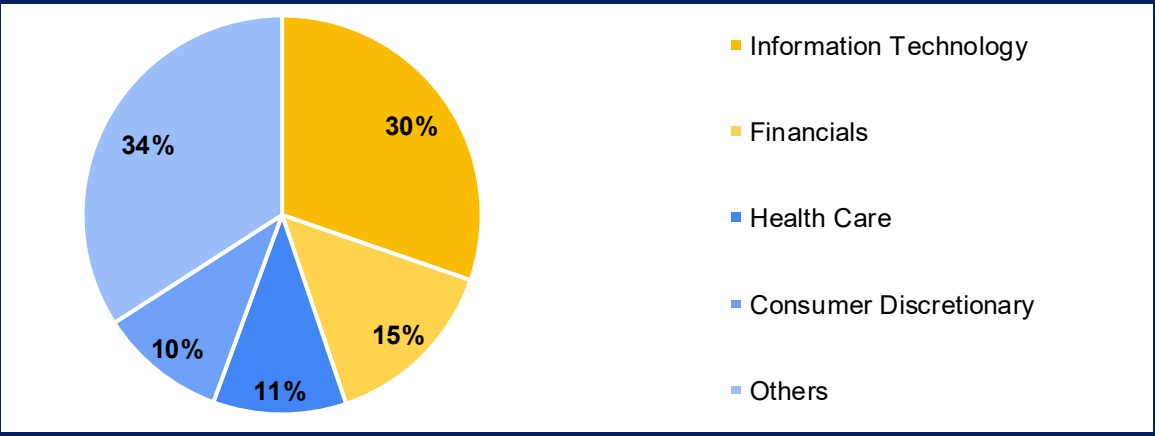
BSc. WiSo (WU)
– 5th Sem.

Overview

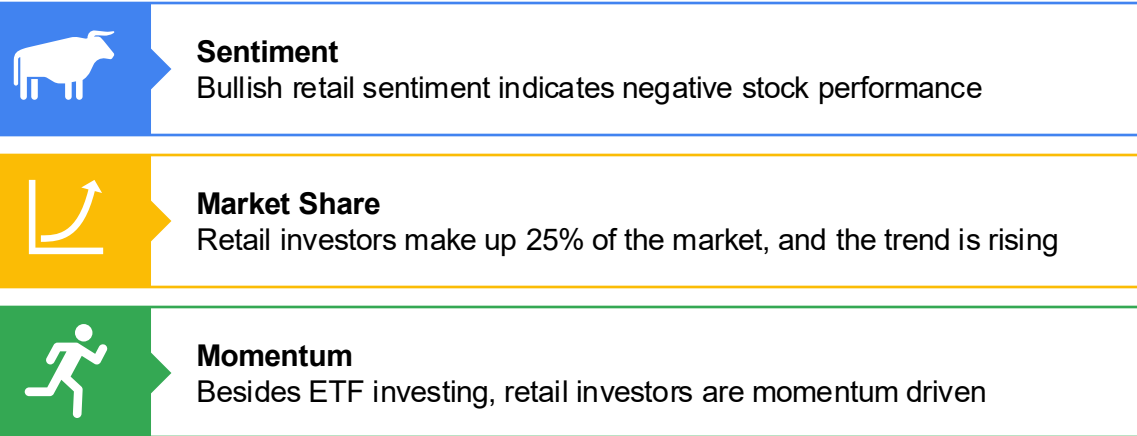
Index and Search Query



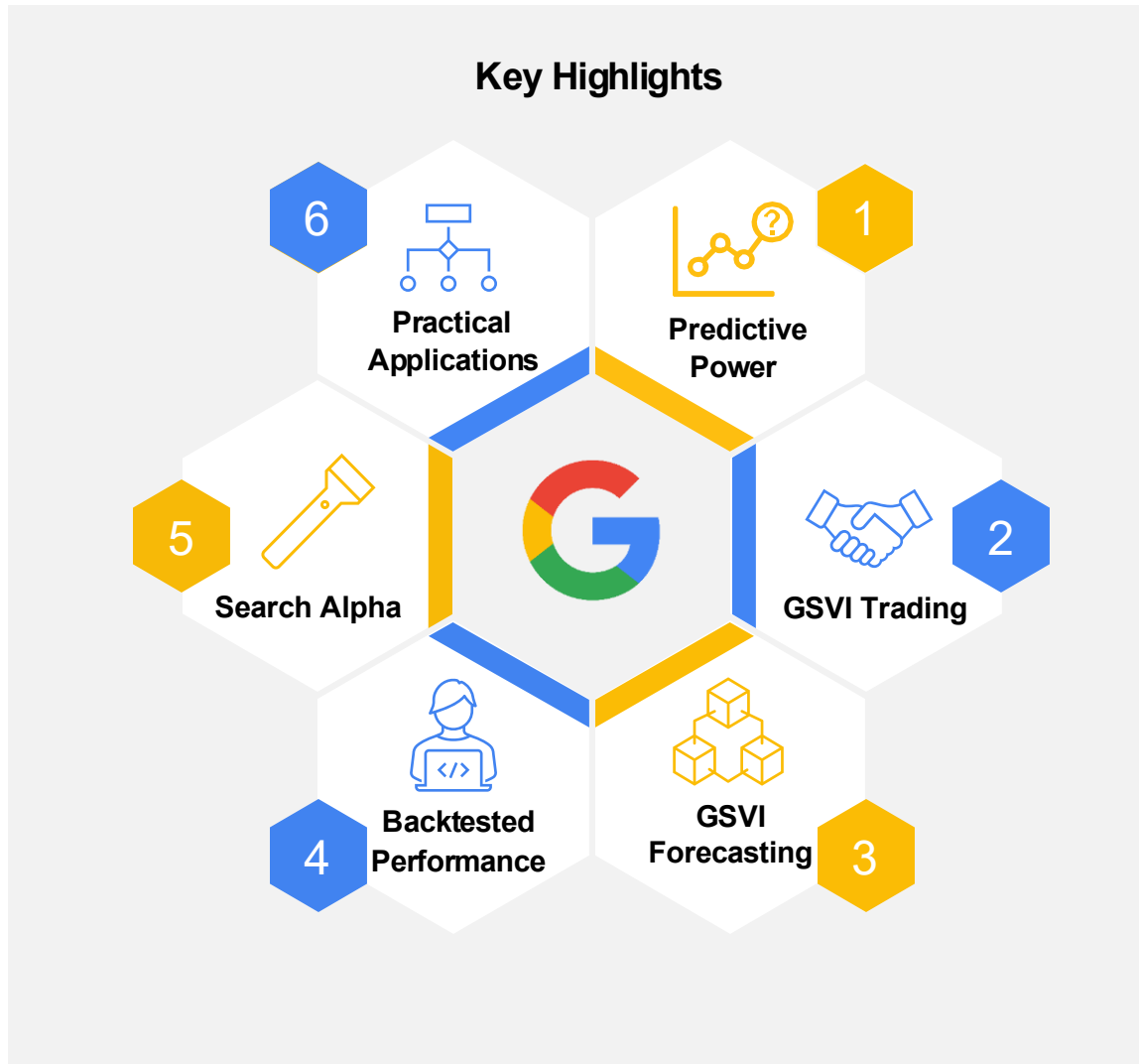
Sectors



Retail Investors

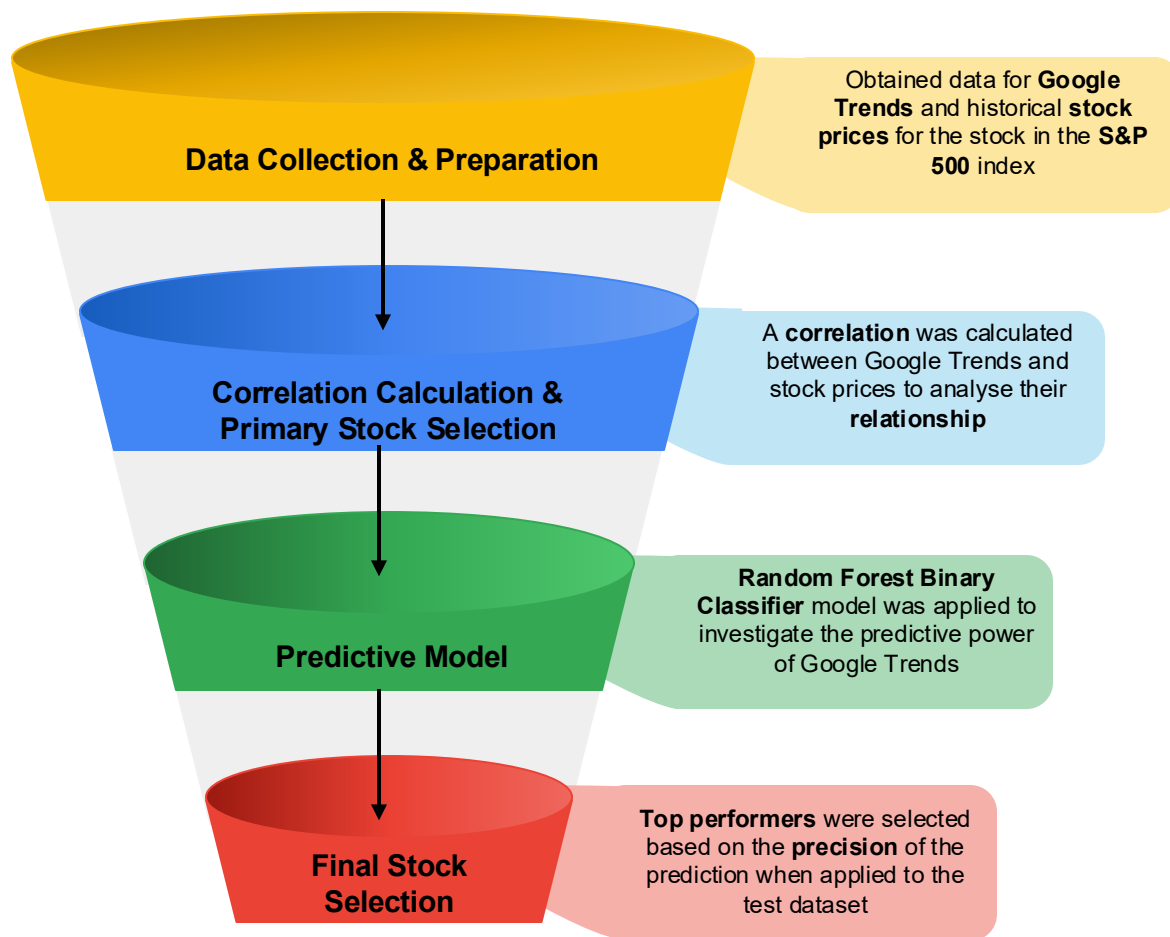


How Effective Is GSVI in Predicting Market Behaviour?

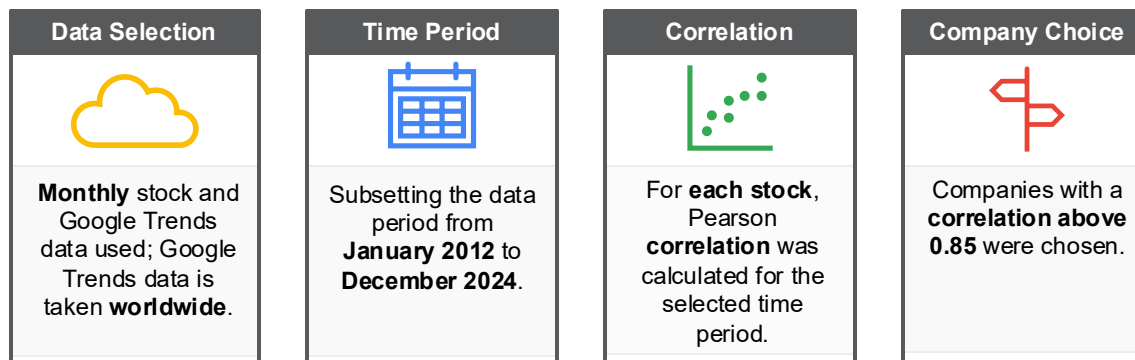


- 1 Predictive Power**
Studies show that GSVI reliably predicts returns, volatility, and trading volumes when using stock tickers as keywords and weekly data
- 2 GSVI Trading**
Search volume spikes in GSVI often lead to short-term price increases, followed by negative returns as investor attention fades
- 3 GSVI Forecasting**
The optimal strategy combines “buy after the spike” and “short after the peak” trades, enhanced by technical indicators such as RSI and volume
- 4 Backtested Performance**
GSVI-based strategies yield positive returns, correlate with gold, move inversely with bonds, and often price in seasonal patterns like Amazon’s Christmas spikes.
- 5 Search Alpha**
GSVI signals capture shifts in investor attention and market psychology, offering exploitable timing advantages for short-term trading strategies
- 6 Practical Applications**
GSVI helps traders anticipate short-term returns, volatility, and reversals with actionable signals across markets

Model Setup

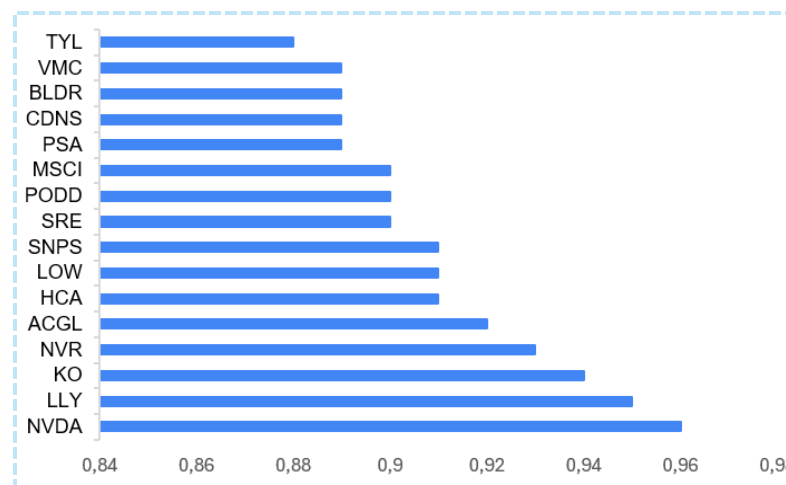


Data Preparation & Correlation Calculation



The **Google Trends Score** is measured as search interest relative to the highest point of search frequencies for the selected region and timeframe. A value of 100 is interpreted as the maximum popularity, and 0 indicates that there was no or little interest.

Primary Stock Selection

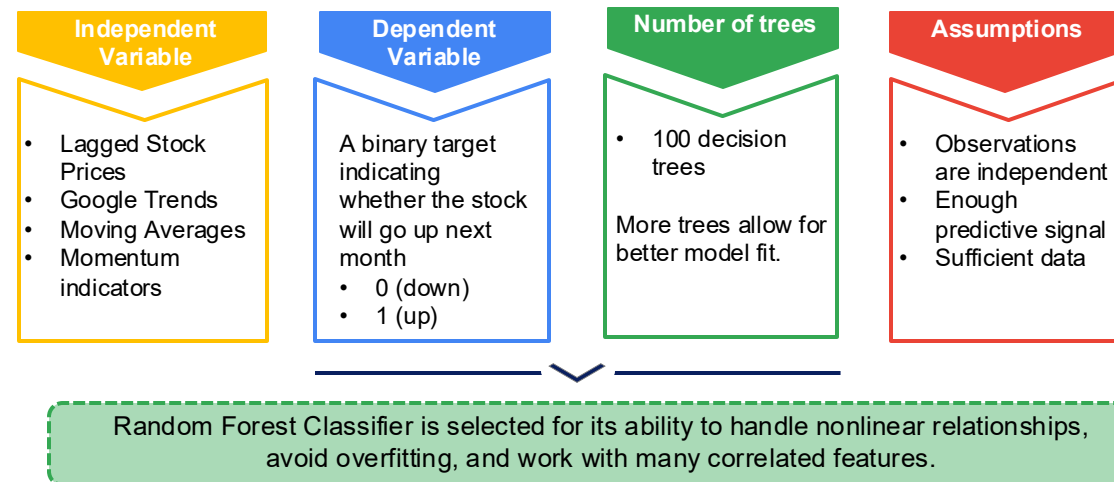


15 stocks with $r > 0.85$ were obtained, with significance at the 5% level.

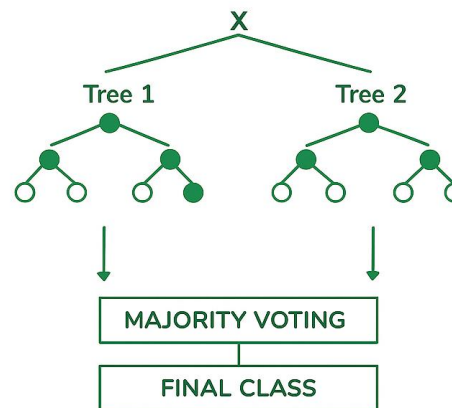
LOW is excluded from further analysis due to its association with other objects.

Random Forest Binary Classifier

Model Specifications



Random Forest

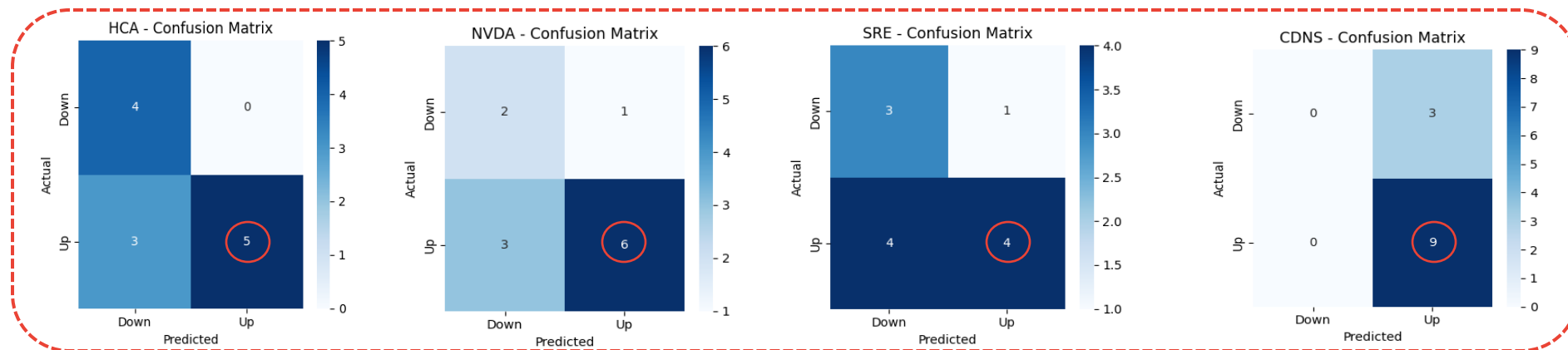


- The model builds **100 trees**, each is trained on a random subset of the data, **sampled using bootstrapping**
- Each tree **splits** the dataset based on the **features**, and at **each node**, only a random subset of features is considered
- Each tree** makes a **prediction**; it outputs either 0 or 1 for a given data point
- Takes **votes** across all trees, and the most common **outcome** becomes the final prediction

Final Stock Selection

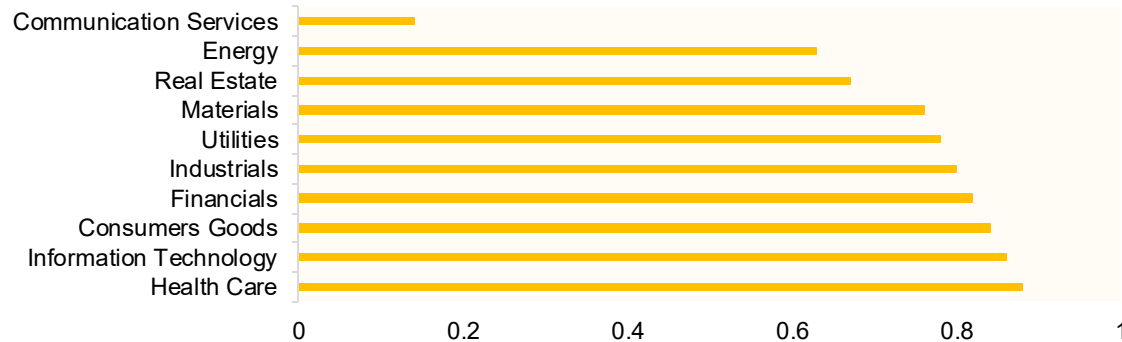
Training data **2012- 2023**

Only stocks with a **precision above 75%** were selected, meaning the model correctly identified an upward movement **more than 75% of the time** when the stock went up



Further Model Information

Correlation by Industries



In the **initial stock** selection, **4 out of 15** companies belonged to the **Information Technology** sector and **3 to Health Care**. In the **final stock** selection, **2 out of 4** companies are from Information Technology, with the remaining two representing Utilities and Health Care, respectively.

Limitations



Data

Restricted download of data points by one IP address

Only 155 observations

Only based on the ticker



Model

Overfitting risk

Market behaviour is non-stationary

Google Searches reflect news coverage or public curiosity, not actual investor behaviour

Interest by Region

HCA	NVDA	SRE	CDNS
1. US	1. Israel	1. Mexico	1. Israel
2. Denmark	2. Hong Kong	2. Sri Lanka	2. Pakistan
3. UK	3. Taiwan	3. Cambodia	3. Taiwan
4. Ireland	4. US	4. Brazil	4. China
5. Singapore	5. Singapore	5. US	5. India



While most Google Trend searches likely come from **individuals interested in finance** or investing, some may stem from **general public interest** in the company or occur **incidentally** during unrelated stock searches.

Further Research

1

Wider data search for Google Trends, include **more keywords**, like the name of the company, and **investigate the effect** for each.

2

Include more **alternative data sources**, social media sentiment from Twitter, Reddit, or Wikipedia page.

3

Include **macroeconomic indicators**, such as inflation, interest rates, VIX etc.

The Model Showed a Precision of 100% for HCA

Overview



HCA Healthcare is operating >180 hospitals and ~2,400 treatment centers. With a network within 20 US states and the UK, HCA Healthcare is a crucial provider in the healthcare sector.

P/E
16,38

MCAP
\$90B

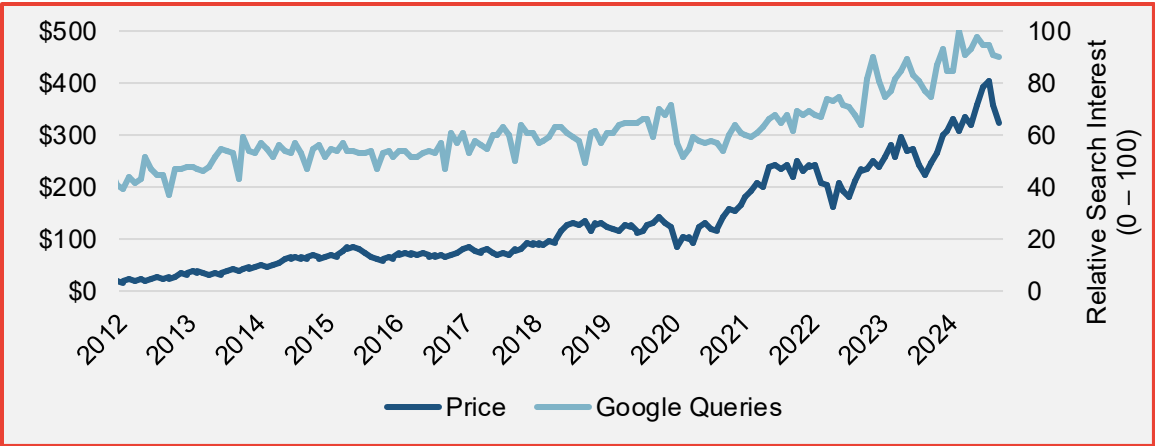
EPS
\$21,96

S&P since
2015

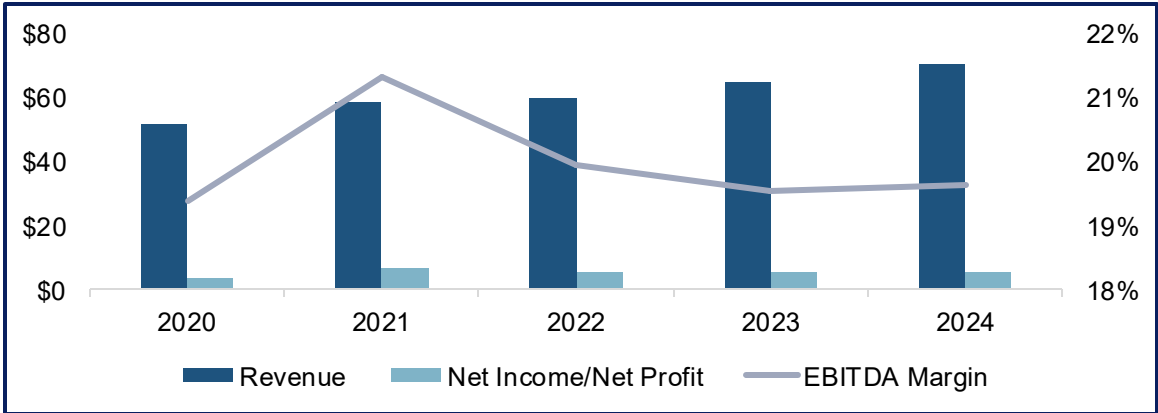
FC = Forecast AC = Actual	FC Up	FC Down
AC Up	5	3
AC Down	0	4

Precision = 100%; Accuracy = 75%

Stock Chart and Google Queries



Financial Analysis (in B)



Drivers / Risks

Spending

CMS expects hospital expenditures in the US to grow 6,1% p.a. until 2031, up to \$2,3T

Investments

Target market share of 29% in 2030 by optimizing outreach with investments of \$5B

Demand


Increasing occurrence of chronic diseases and mental health issues increase demand for healthcare

Innovation


Implementation of AI increases efficiencies and decreases costs of labor and misdiagnoses

NVDA Shows the Highest Correlation of 96%

Overview




nvidia.




Sector:
Information
Technology


Global leader in AI and accelerated computing, built on its full-stack platform, combining industry-leading GPUs, proprietary software (CUDA), and a vast developer ecosystem.




P/E
46,21



MCAP
\$3,5T



EPS
\$1,3

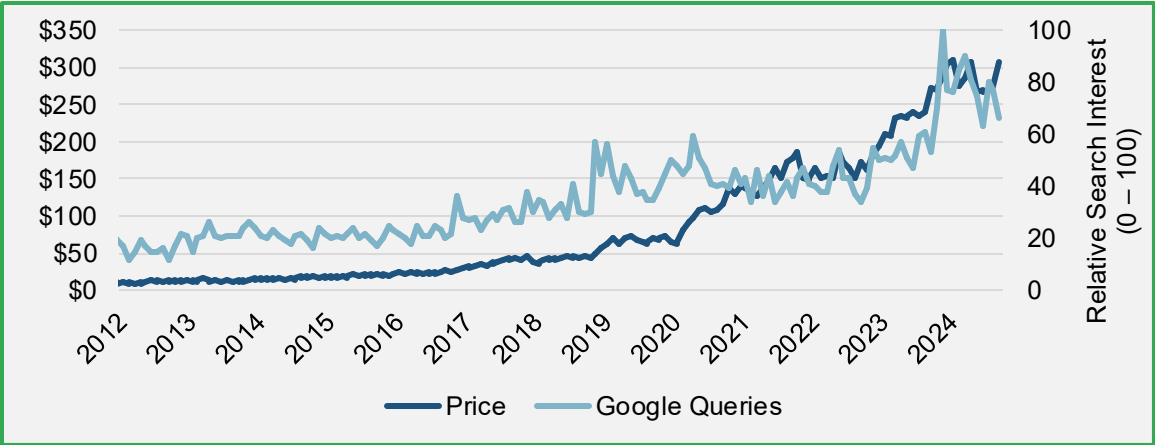


S&P since 2017

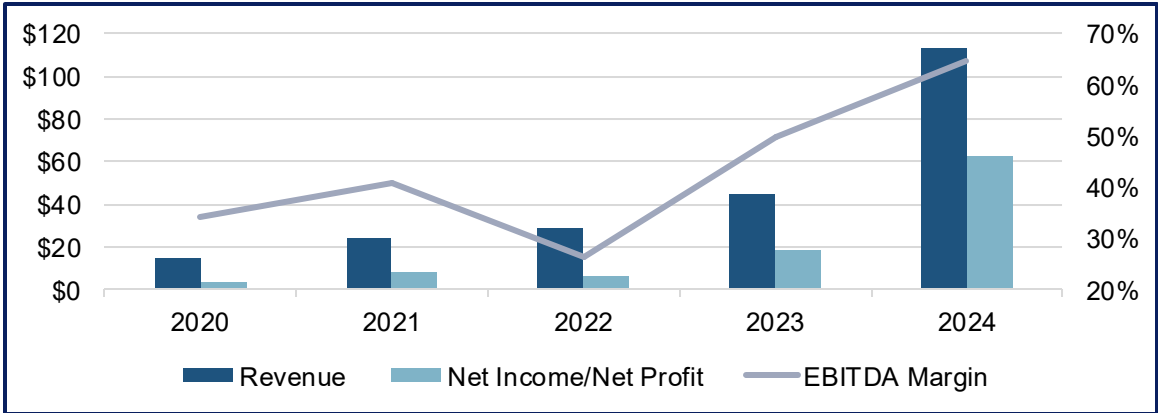
FC = Forecast AC = Actual	FC Up	FC Down
AC Up	6	3
AC Down	1	2

Precision = 85,71%; Accuracy = 66,67%


Stock Chart and Google Queries



Financial Analysis (in B)




Drivers / Risks




AI Boom

AI factories & generative AI driving GPU & platform demand




3D Expansion

Growth in Omniverse, Physical AI, and Sovereign AI markets



Platform Moat

Durable advantage through CUDA, AI software, and broad platform use





External Risks

Export controls, manufacturing dependency, competition from AMD/Intel


Precision of the Model for SRE Is at 80% with 4 Correct Forecasts

Overview




Sector:
Utilities


Sempra is a leading North American energy infrastructure company headquartered in California. It operates regulated utilities (SDG&E, SoCalGas, and Oncor).




P/E
14,71



MCAP
\$48B



EPS
\$4,65

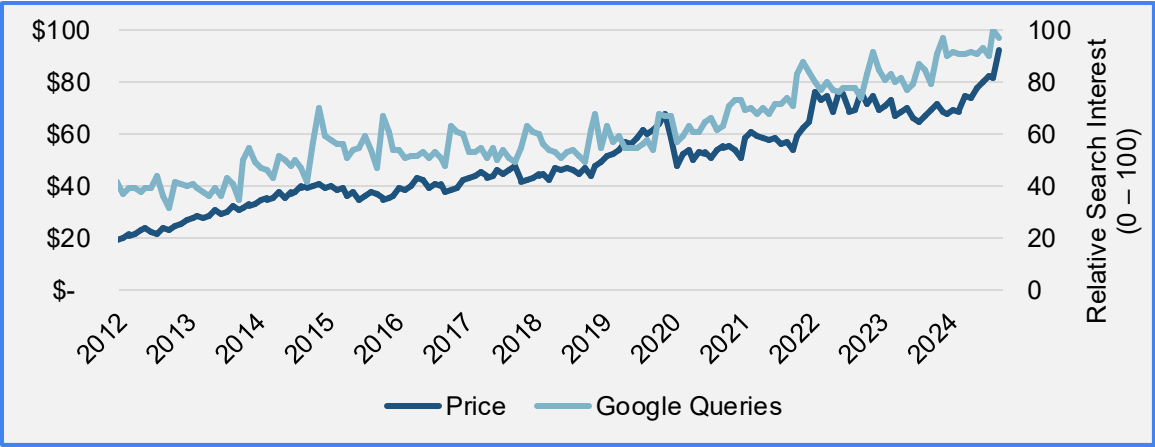


S&P since
2017

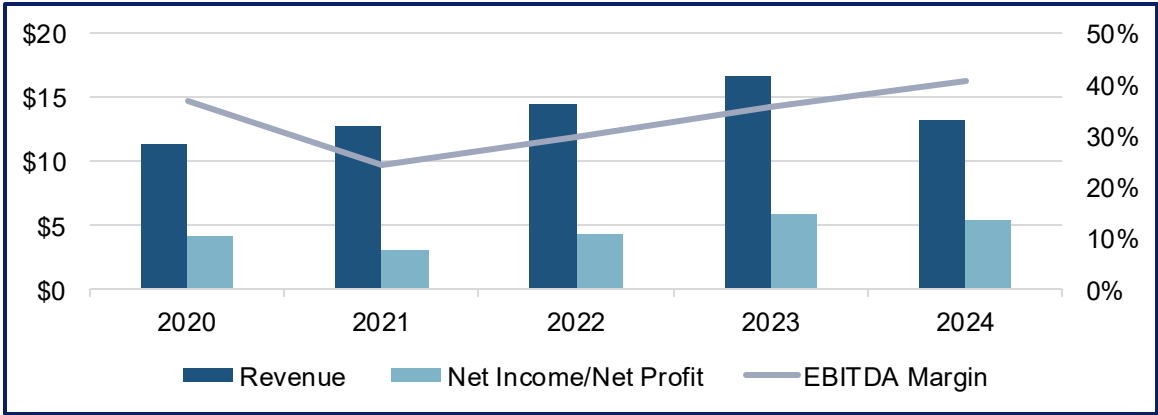
FC = Forecast AC = Actual	FC Up	FC Down
AC Up	4	4
AC Down	1	3

Precision = 80%; Accuracy = 58,33%


Stock Chart and Google Queries



Financial Analysis (in B)




Drivers / Risks




Utility Expansion

\$56 billion capex plan (2024–2028) to grow regulated rate base in CA & TX




LNG Infrastructure

Long-term contracted export terminals driving hard-currency cash flows



Energy Transition

Investments in renewable energy fuels and grid modernization toward net-zero



External Risks

Regulatory risk, project overruns, market volatility, and rate sensitivity

Cadence Design Systems

CDNS shows both lasting returns and revenue growth

Overview

cadence[®]



Leading technology company specializing in software and hardware tools for designing and verifying complex electronic systems used across multiple industries.

P/E
66,8

MCAP
\$82,87B

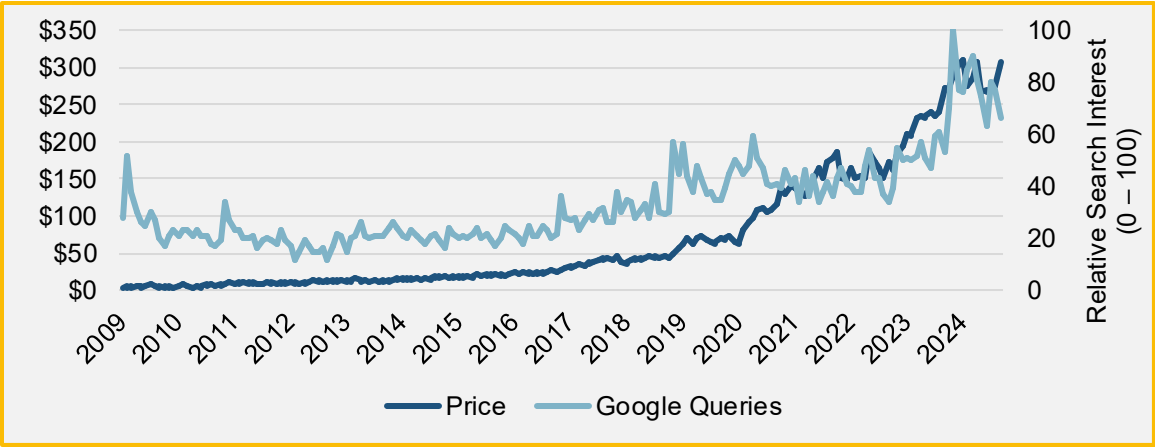
EPS
4,55

S&P since 2017

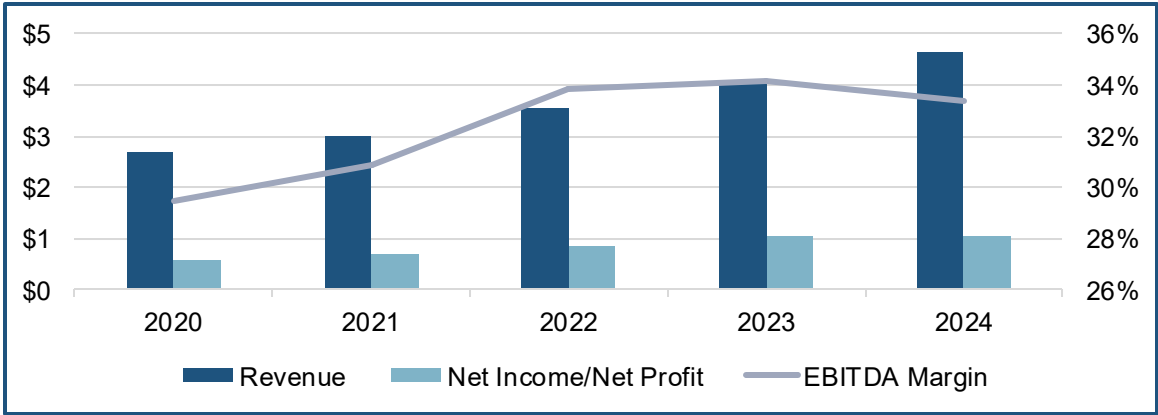
FC = Forecast AC = Actual	FC Up	FC Down
AC Up	9	0
AC Down	3	0

Precision = 75%; Accuracy = 75%

Stock Chart and Google Queries



Financial Analysis (in B)



Drivers / Risks

AI-Powered Tools

Cadence's AI tools are a major differentiator and unlock efficiency in complex chip design

Platform Strength

Strong competitive position due to integrated software, hardware, and IP

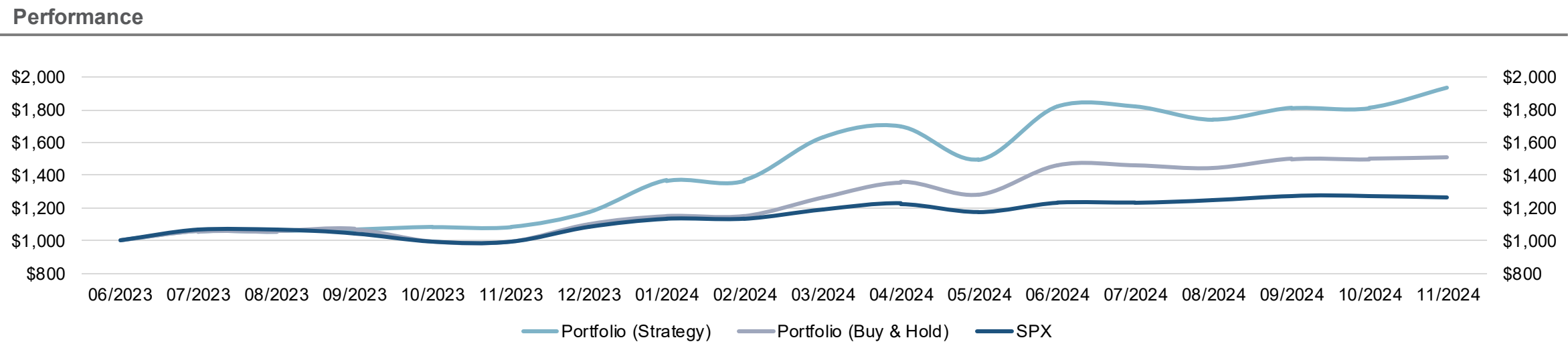
China Exposure

Significant revenue comes from China, subject to U.S. export controls and regulatory shifts


Client Dependency

Revenue depends on a few large semiconductor clients and sectors


Our Strategy Outperformed Both the S&P 500 and a Buy & Hold Strategy of the Same Stocks




Trades



Trading Days
Due to date issues, we were only trading **12 months from beginning of June 2023 until End of October 2024**, always holding for 1 month




Allocation
Each months, we would **equally reallocate** all assets amongst all **indicated stocks**



Long Only
Only long positions were chosen in the quantitative strategy and in months without trading, assets were kept steady


Summary

Performance




The quantitative strategy (**93,84%**) outperformed the buy and hold strategy of the same stocks (**50,99%**) and the S&P 500 (**26,22%**)

Monthly Comparison



8 out of 12 months, the **quantitative portfolio** outperformed the buy and hold strategy

Single Stocks



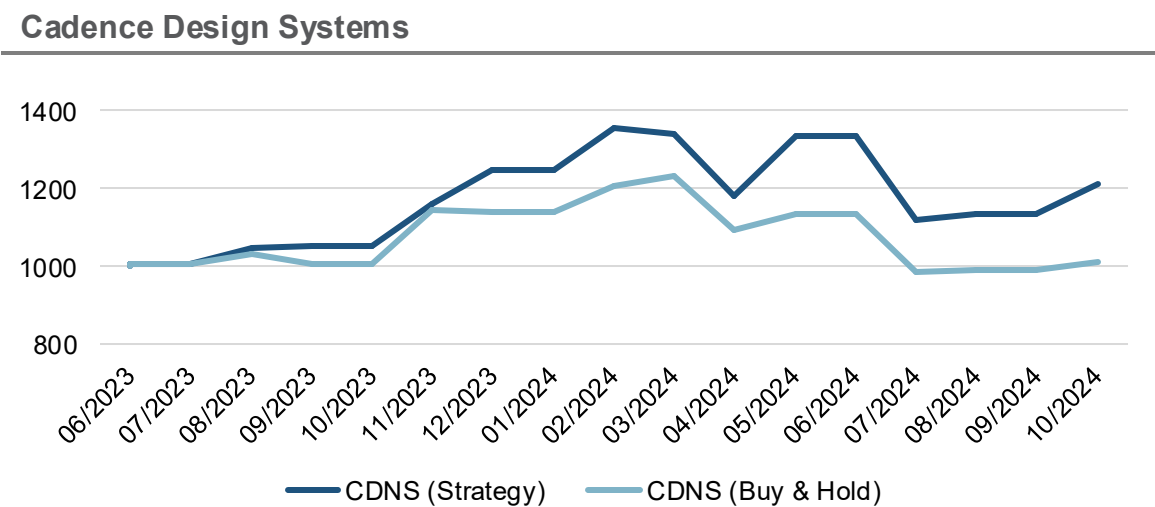
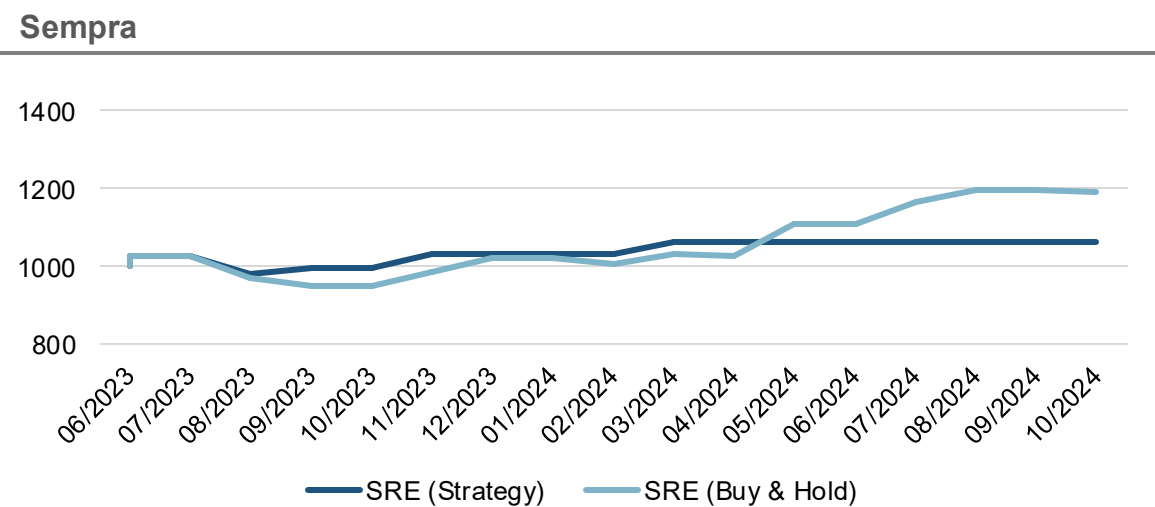
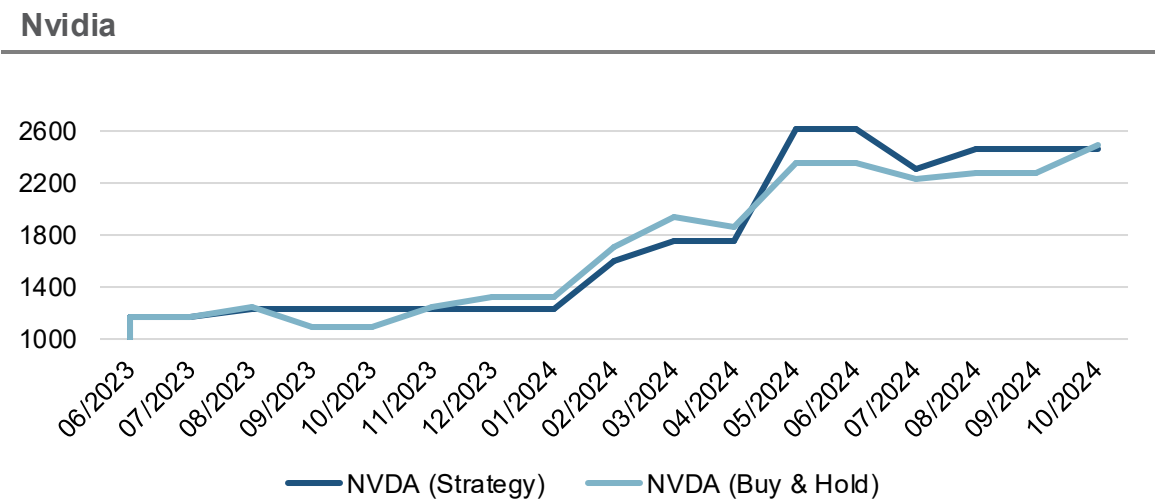
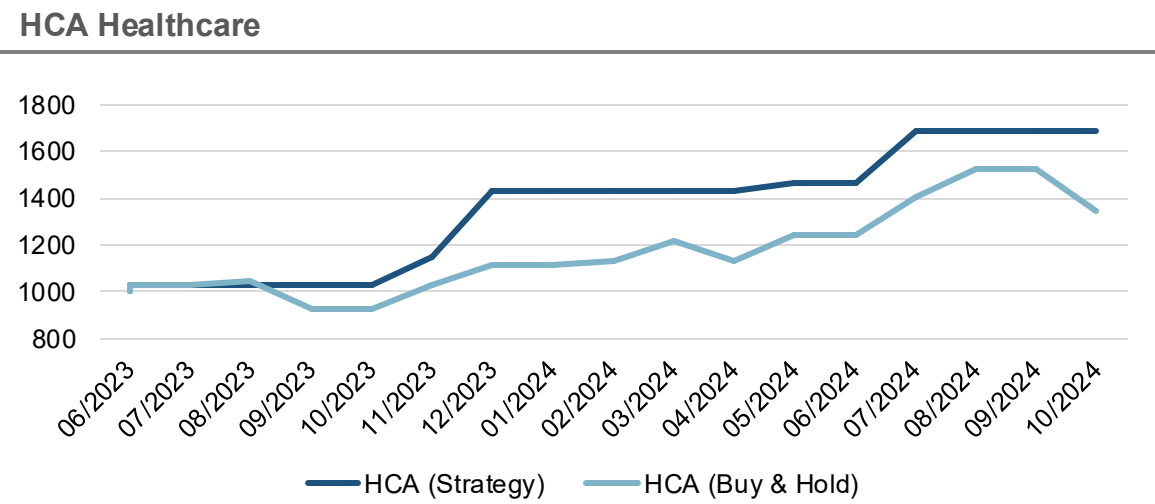
Looking at the single stocks, **2 out of 4 stocks** outperformed when using the quantitative approach when held on its own

A low-angle, upward-looking photograph of several modern skyscrapers. The buildings are constructed with dark, grid-like facades and glass windows. The perspective creates a sense of height and scale, with the buildings converging towards the top of the frame. The sky is a clear, pale blue. The overall color palette is dominated by blues and greys, giving it a professional and architectural feel.

Appendix

Portfolio II

The Quantitative Approach Outperformed in 2 Out Of 4 Times



Sources

Source Name	Link	Date of Retrieval	Used for
Financial Innovation	Link	22.05.2025	Slide 4
Io-fund	Link	10.06.2025	Slide 3
Cui, Wei & Gao, 2025	Link	10.06.2025	Slide 3
JPMorgan Chase & Co	Link	10.06.2025	Slide 3
HCA Healthcare	Link	13.06.2025	Slide 8
Nvidia Corporation	Link	13.06.2025	Slide 9
Sempra	Link	13.06.2025	Slide 10
Cadence Design Systems	Link	13.06.2025	Slide 11

Code available upon request.

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