

ArcticGuardian

AI tool to adapt your Investments for a Climate-Resilient Future



Replicate

Kamal



Objective of ArcticGuardian

1. Provide the ability to protect investor's portfolio from the adverse impacts of climate change by analyzing & quantifying the climate risks that their portfolio is subjected to with Snowflake Arctic
2. Position your portfolio in order to avoid such risk **without necessarily sacrificing returns or taking higher unrewarding risk.** Active Intelligence not just risk.

Users: Retail or professional Investors - broad applicability

Datasets

- **Earning call Transcripts** - Earnings call transcripts are written records of unrehearsed discussions between company executives & analysts during quarterly conference calls, detailing financial results, strategy, Sustainability and outlook. (Mgmt discussions are unrehearsed)
- `S&P 500` constituent weights (Note- when you invest in S&P ETF (largest ETF by AUM in the world) you essentially invest in these constituent weights which might not be optimal for Climate risks)

100 randomly selected stocks from the `S&P 500` index

Enrich the above data with Stock Returns over the last 6 months

| S&P 500 ETF Components | | | | | | |
|---|------------------------------|--------|------------|----------|-------|----------|
| This list shows the holdings of the SPDR S&P 500 ETF Trust (SPY). | | | | | | |
| # | Company | Symbol | Portfolio% | Price | Chg | % Chg |
| 1 | Microsoft Corp | MSFT | 7.02% | ▲ 407.39 | 0.73 | (0.18%) |
| 2 | Apple Inc. | AAPL | 6.18% | ▼ 181.89 | -1.49 | (-0.81%) |
| 3 | Nvidia Corp | NVDA | 5.09% | ▲ 911.87 | 23.98 | (2.70%) |
| 4 | Amazon.com Inc | AMZN | 3.95% | ▼ 185.49 | -0.72 | (-0.39%) |
| 5 | Meta Platforms, Inc. Class A | META | 2.31% | ▲ 455.15 | 3.19 | (0.71%) |

ESG Risk

1. Extracts relevant statements related to Climate Risk using Snowflake Arctic (Replicate)

``The increasing frequency of extreme weather conditions is causing concerns for our supply chain and infrastructure``

``The transition to a low-carbon economy presents both risks and opportunities for our business``

``Health care costs continue to rise due to higher wages and labor shortages in the healthcare sector.``

more examples - UI

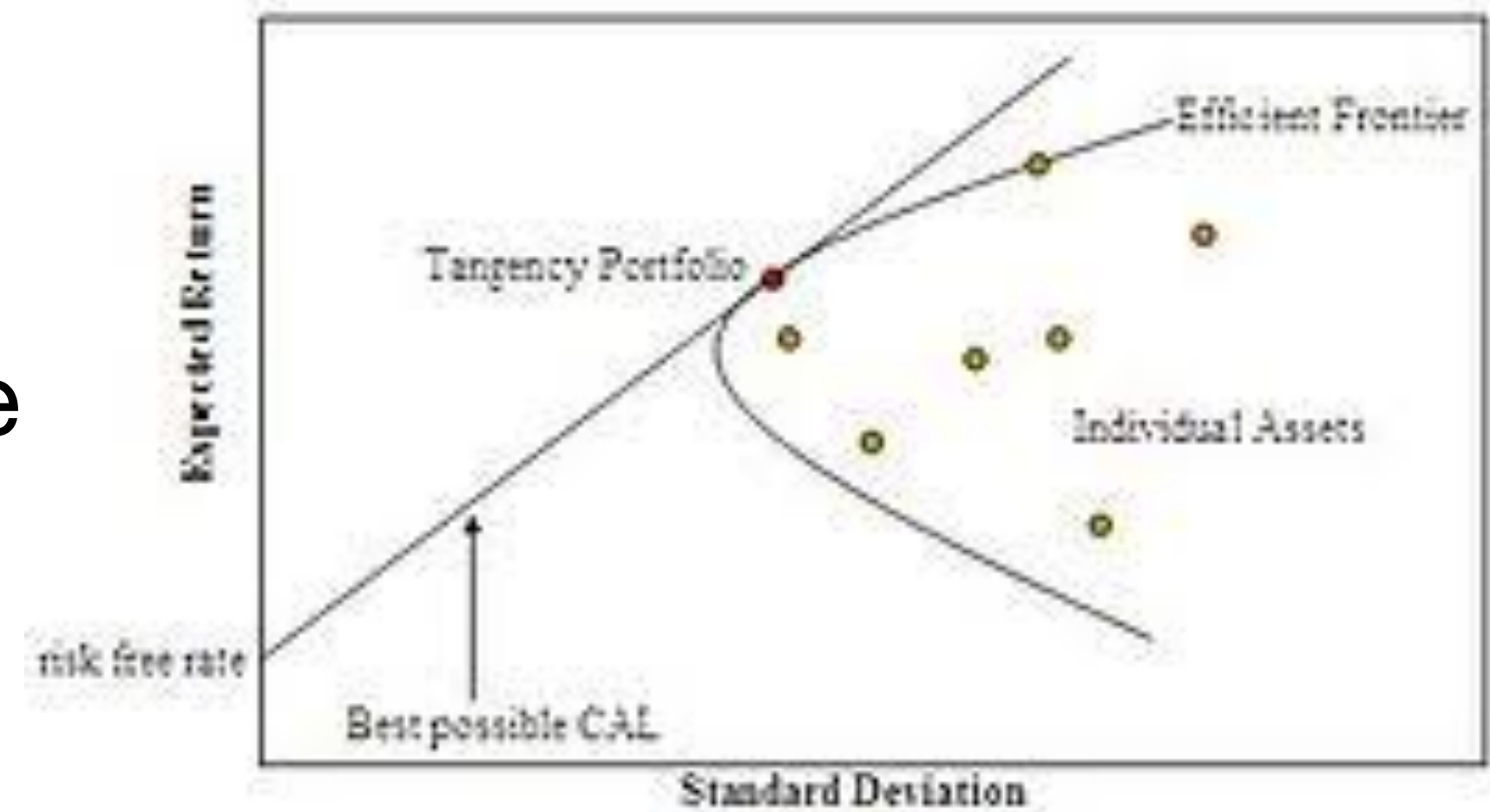
| | climate_risk_count | returns_6m |
|--------------------|--------------------|------------|
| climate_risk_count | 1.000000 | -0.117329 |
| returns_6m | -0.117329 | 1.000000 |

Optimization

Objective -

Increase Returns, Reduce Volatility(Portfolio Risk)- Sharpe

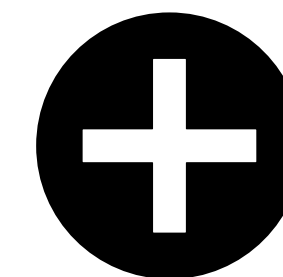
Reduce Climate Risk



Non-linear constrained optimization on Sharpe Ratio and Climate Risk

$$\text{Sharpe Ratio} = \frac{(\text{Expected Return}_{\text{Portfolio}} - \text{Risk-Free Rate})}{\text{Standard Deviation}_{\text{Portfolio}}}$$

Wall Street Prep



Climate Risk
(climate_risk_count)

Modern Portfolio Theory for which Harry Markowitz won Nobel Prize

Dashboard - Demo(Voila) , Databricks(Cloud)

Select the number of stocks(5/10/15/20/100)

MarketCap(if chosen True then you get mega cap stocks like MSFT/ AAPL else its randomly selected)

Choose to use ESG Risk in the optimizer or not - see difference

Climate risk comparison:

Visualise and evaluate if the optimization was successful (like current portfolio risk vs optimal portfolio risk - lowered)

Optimize

| | ticker | Company | returns_6m | sp500_weight_norm | optimised_weight | climate_risk_norm | trade_reco |
|---|--------|--------------------------|------------|-------------------|------------------|-------------------|------------|
| 0 | ALL | The Allstate Corporation | 23.1394 | 34.4828 | 30 | 0.5 | Underweigh |
| 1 | DVN | Devon Energy Corporation | 12.1834 | 24.1379 | 10 | 0.5 | Underweigh |
| 3 | NTAP | Netapp, Inc | 39.2965 | 17.2414 | 40 | 0 | Overweigh |
| 2 | SBAC | Sba Communications Corp | -12.8165 | 17.2414 | 10 | 0.5 | Underweigh |
| 4 | BEN | Franklin Resources, Inc. | 5.524 | 6.8966 | 10 | 0.6 | Overweigh |

Max Stocks

5

Market Cap

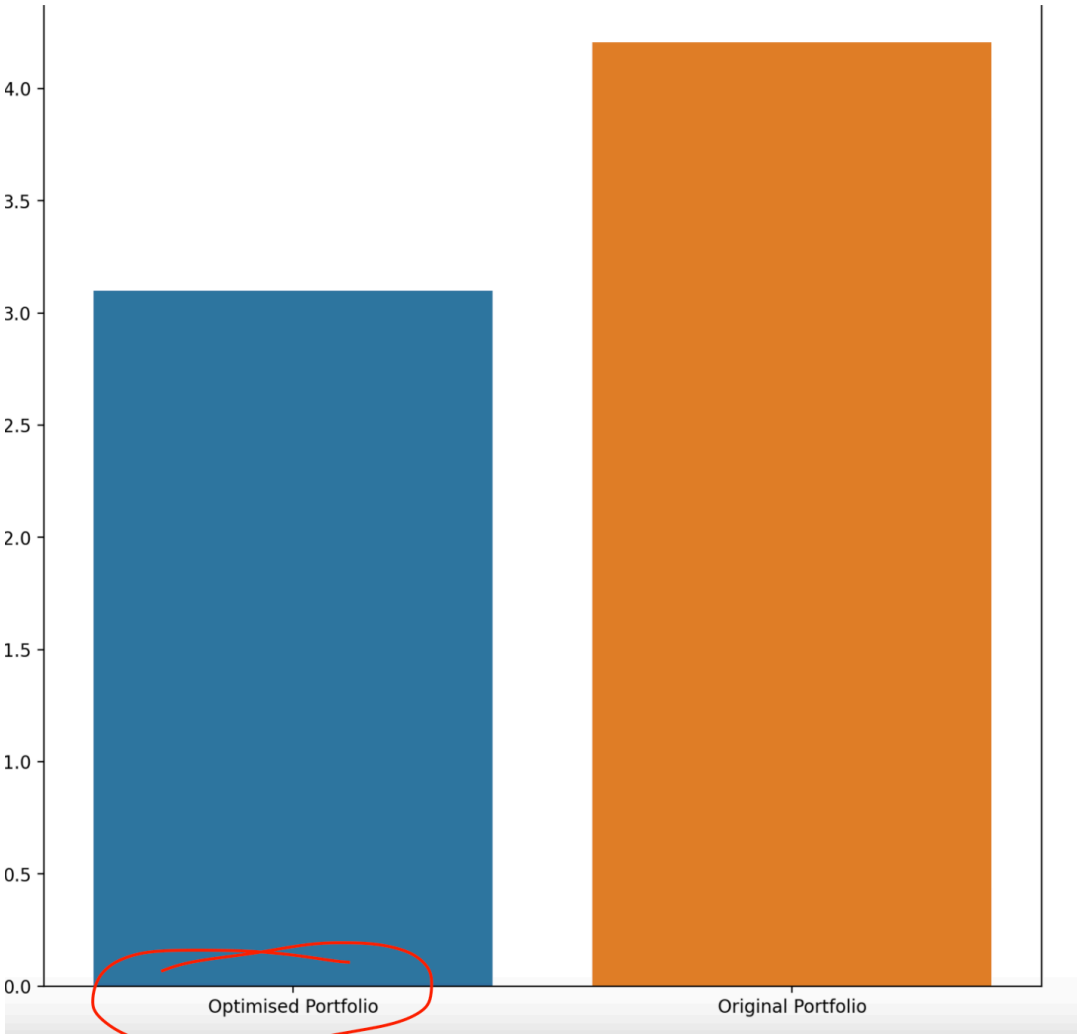
False

ESG Risk

True

Optimize

☐ Show Example Climate Risk Statements



Dashboard

Dataframe:

a) Optimised weights

b) S&P default weights normalised that you're using if you invest in S&P 500 ETF directly.

c) Trade Recommendation - Overweight/Underweight or Buy/Sell more

Max Stocks

5

Market Cap

False

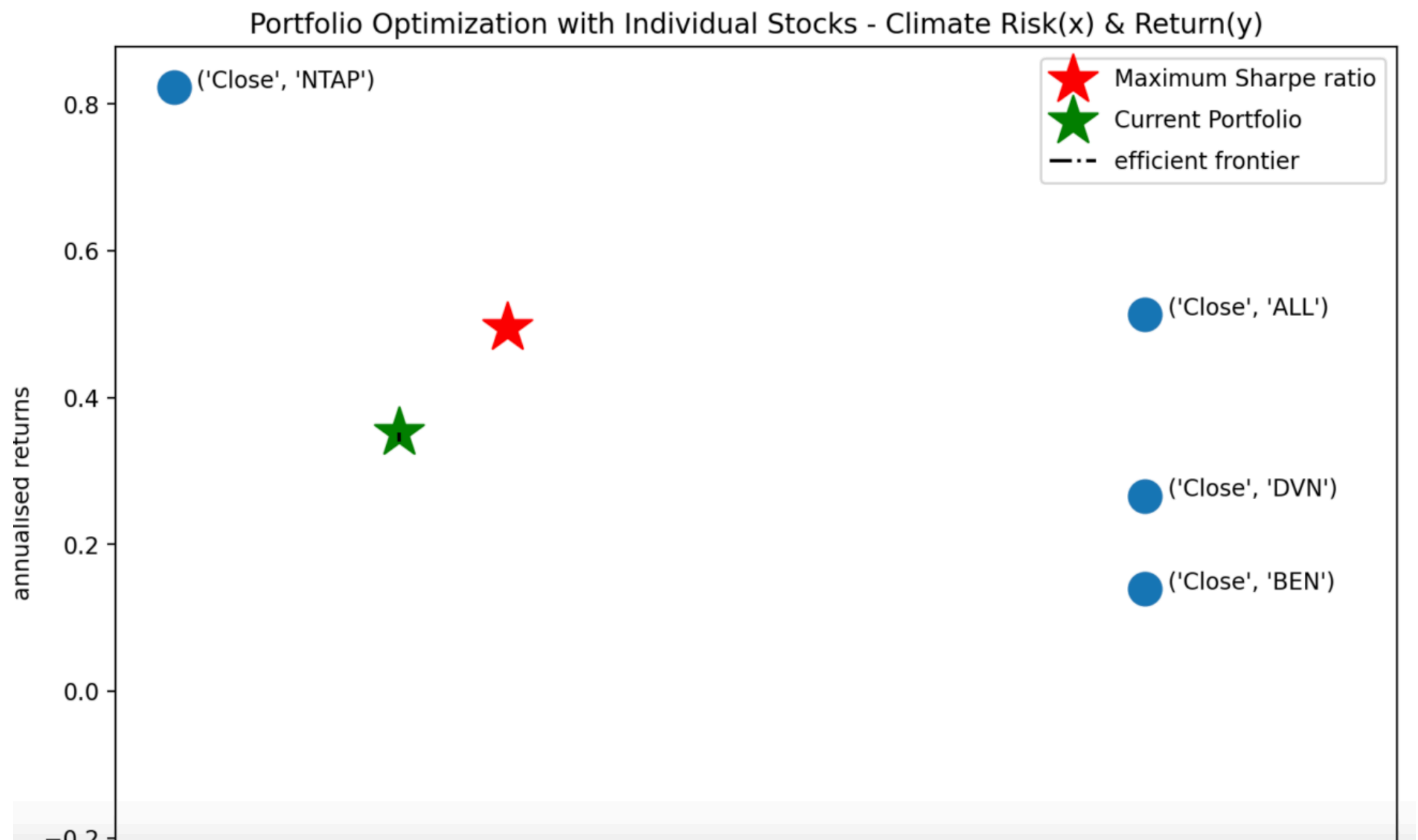
ESG Risk

True

Optimize

| | ticker | Company | returns_6m | sp500_weight_norm | optimised_weight | climate_risk_norm | trade_reco |
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Dashboard



Disclaimer

Demo