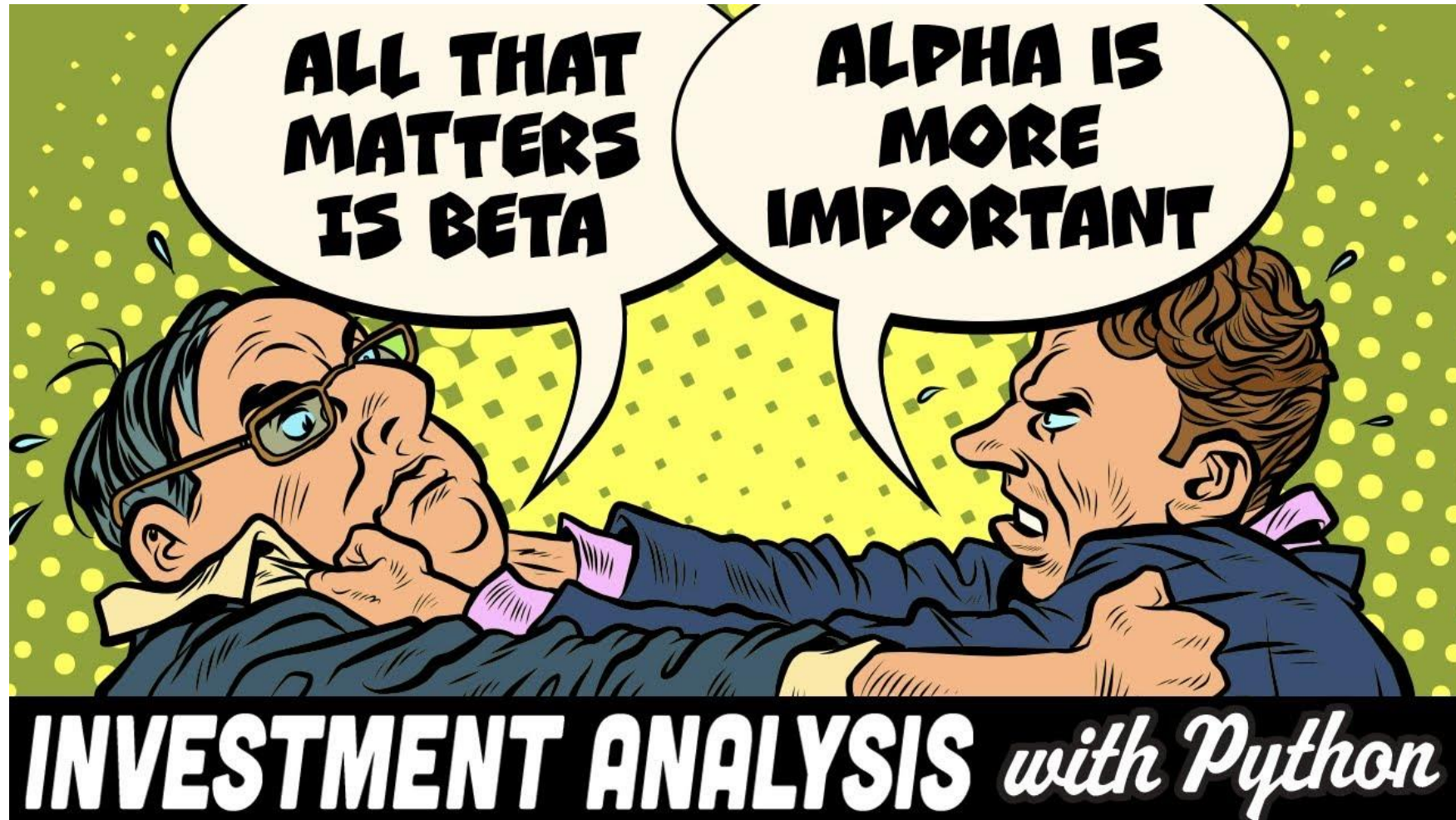


Investments



Investment
Fund Pitch

LVMH
MOËT HENNESSY • LOUIS VUITTON

L'ORÉAL
PARIS



Here's how rising global interest rates could impact your life

ECONOMY

Inflation rises 7% over the past year, highest since 1982



$$S_t = \frac{div_{t+1}}{(1+r)^1} + \frac{div_{t+2}}{(1+r)^2} + \dots + \frac{div_{t+n-1}}{(1+r)^{n-1}} + \frac{div_{t+n}}{(1+r)^n}$$



High for High div. stocks, low
For low div. growth stocks



Little effect of increase in r



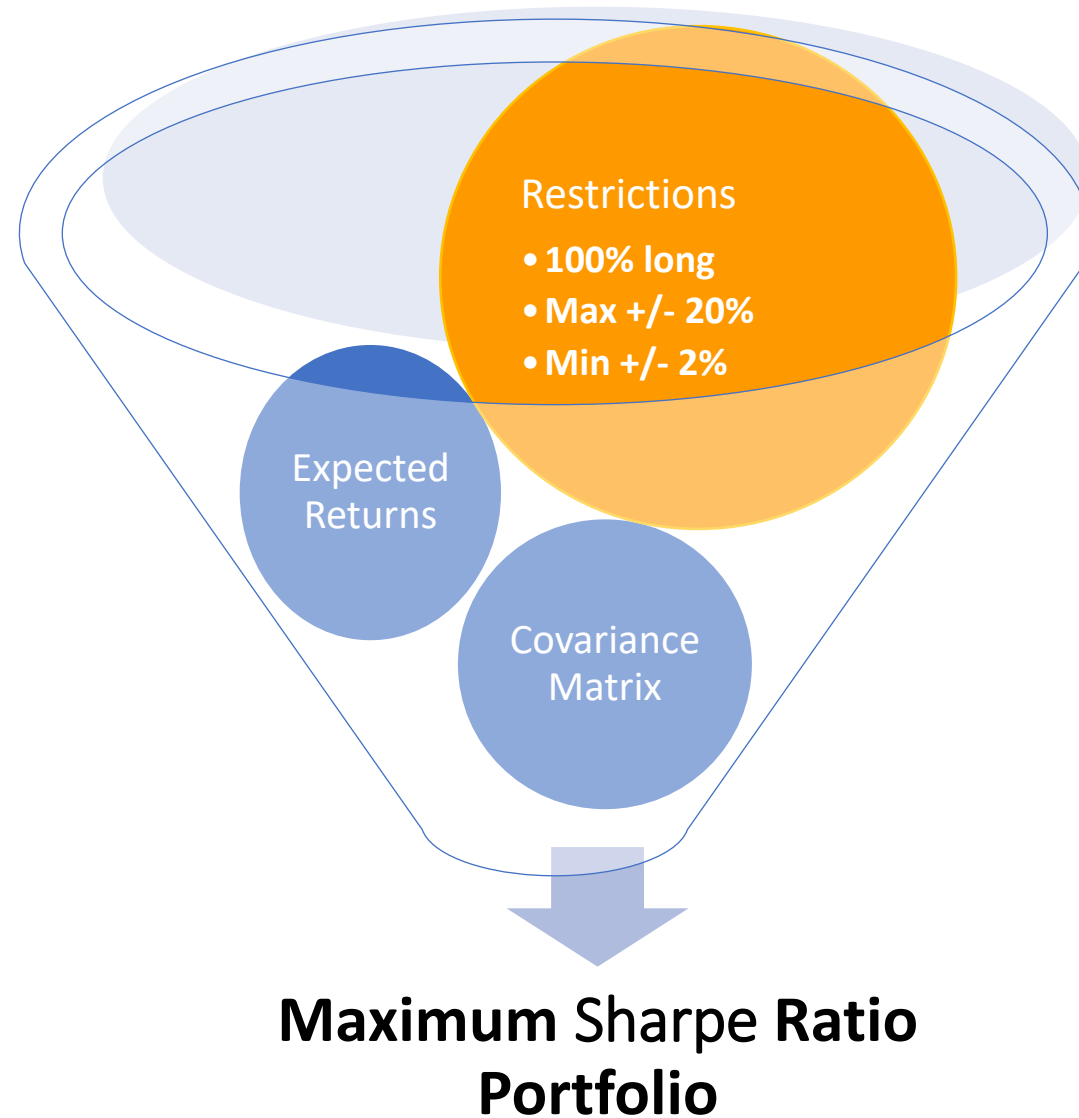
High for low div. growth stocks

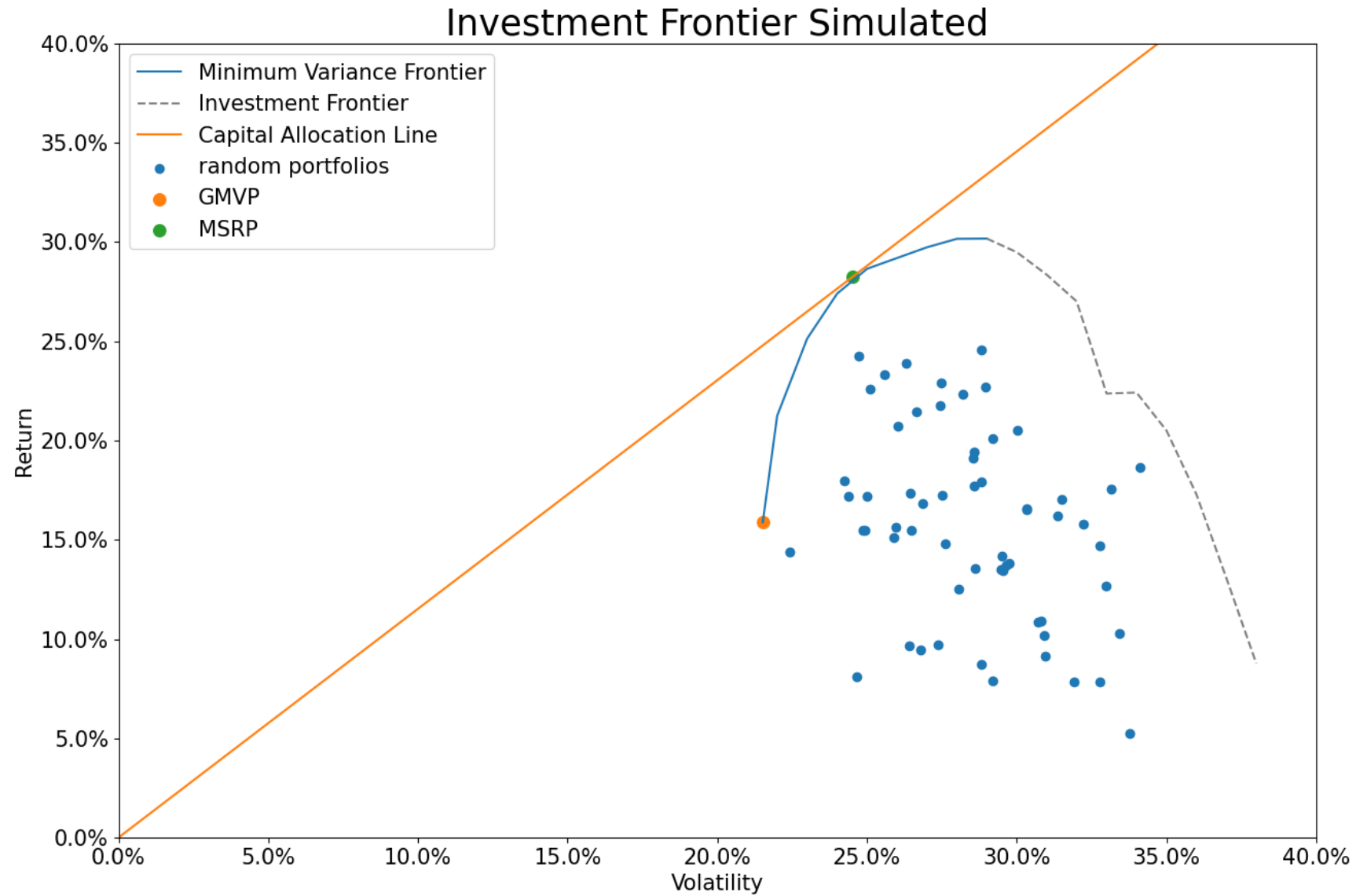


Strong effect of increase in r

So, why did we choose this strategy?

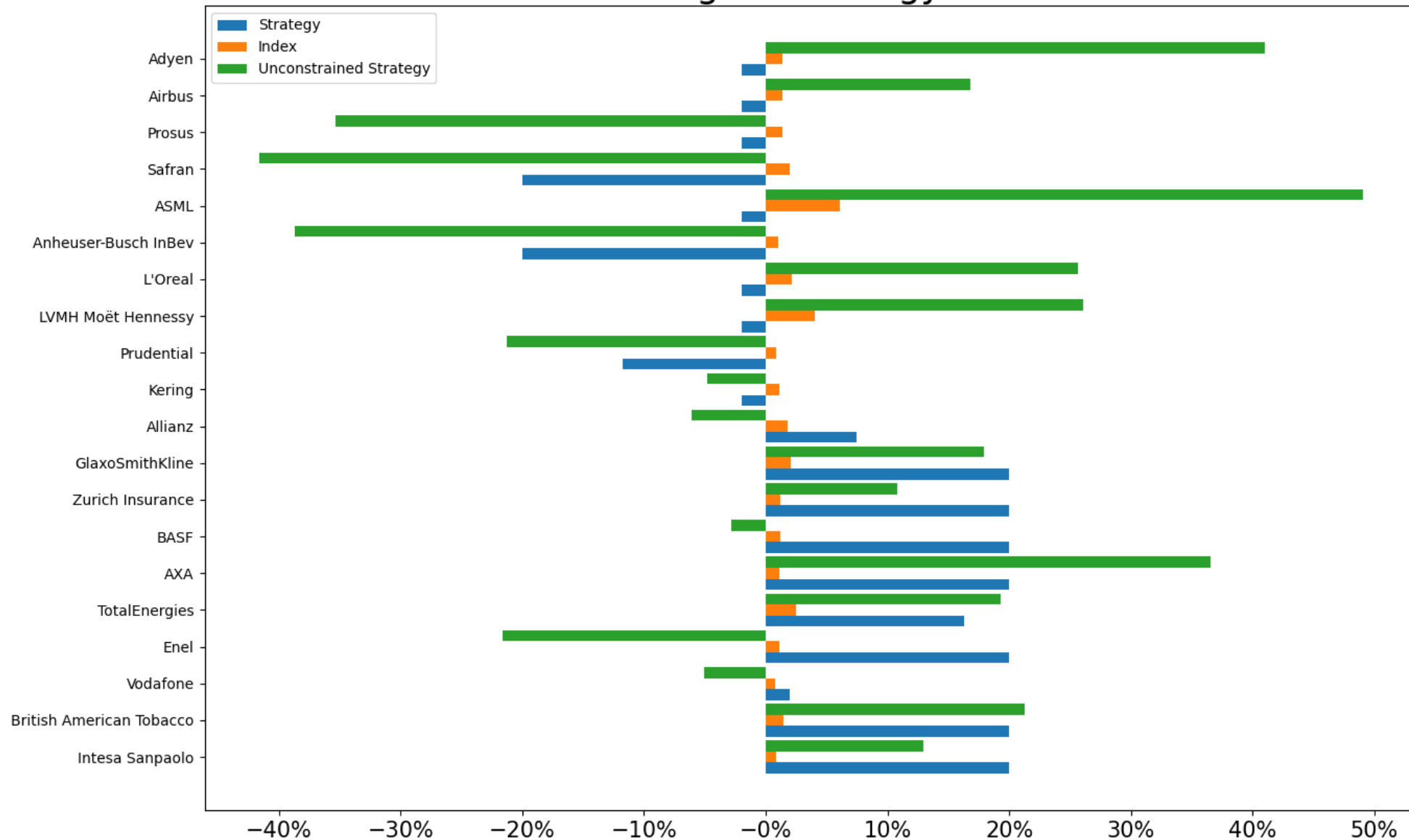
Implementation and restrictions





	Name	Currency	Country	Sector	Yield	Forward_PE	Trailing_PE	PB_Ratio	index_weights	weights	weights_unconst
ISP.MI	Intesa Sanpaolo	EUR	Italy	Financial Services	9.50%	9.02	10.66	0.59	0.87%	20.00%	12.94%
BATS.L	British American Tobacco	GBp	United Kingdom	Consumer Defensive	8.04%	9.78	11.77	1.18	1.44%	20.00%	21.29%
VOD.L	Vodafone	GBp	United Kingdom	Communication Services	8.01%	12.76	19.48	0.72	0.80%	2.00%	-5.08%
ENEL.MI	Enel	EUR	Italy	Utilities	7.90%	11.00	19.15	2.03	1.14%	20.00%	-21.62%
TTE.PA	TotalEnergies	EUR	France	Energy	6.06%	4.85	8.25	1.20	2.46%	16.28%	19.26%
CS.PA	AXA	EUR	France	Financial Services	5.80%	7.71	7.76	0.74	1.13%	20.00%	36.56%
BAS.DE	BASF	EUR	Germany	Basic Materials	5.73%	8.57	8.87	1.08	1.19%	20.00%	-2.82%
ZURN.SW	Zurich Insurance	CHF	Switzerland	Financial Services	5.25%	12.35	13.03	1.77	1.22%	20.00%	10.83%
GSK.L	GlaxoSmithKline	GBp	United Kingdom	Healthcare	5.06%	14.41	17.54	5.56	2.02%	20.00%	17.89%
ALV.DE	Allianz	EUR	Germany	Financial Services	4.87%	8.92	17.82	1.14	1.77%	7.46%	-6.13%
KER.PA	Kering	EUR	France	Consumer Cyclical	1.16%	14.62	18.24	4.28	1.08%	-2.00%	-4.82%
PRU.L	Prudential	GBp	United Kingdom	Financial Services	1.03%	9.60	15.03	2.02	0.87%	-11.74%	-21.31%
MOH.F	LVMH Moët Hennessy	EUR	France	Consumer Cyclical	0.97%	21.19	23.97	6.11	4.01%	-2.00%	26.05%
LOR.F	L'Oreal	EUR	France	Consumer Defensive	0.96%	29.50	37.36	6.97	2.12%	-2.00%	25.67%
ABI.BR	Anheuser-Busch InBev	EUR	Belgium	Consumer Defensive	0.95%	17.48	24.75	1.43	0.99%	-20.00%	-38.70%
ASML.AS	ASML	EUR	Netherlands	Technology	0.47%	30.49	38.90	22.88	6.12%	-2.00%	49.08%
SAF.PA	Safran	EUR	France	Industrials	0.40%	26.11	958.80	3.19	2.00%	-20.00%	-41.57%
PRX.AS	Prosus	EUR	Netherlands	Communication Services	0.19%	8.18	3.79	2.76	1.34%	-2.00%	-35.36%
AIR.PA	Airbus	EUR	Netherlands	Industrials	0.00%	20.70	16.58	7.74	1.37%	-2.00%	16.84%
ADYEN.AS	Adyen	EUR	Netherlands	Technology	0.00%	72.46	94.70	24.80	1.36%	-2.00%	40.99%

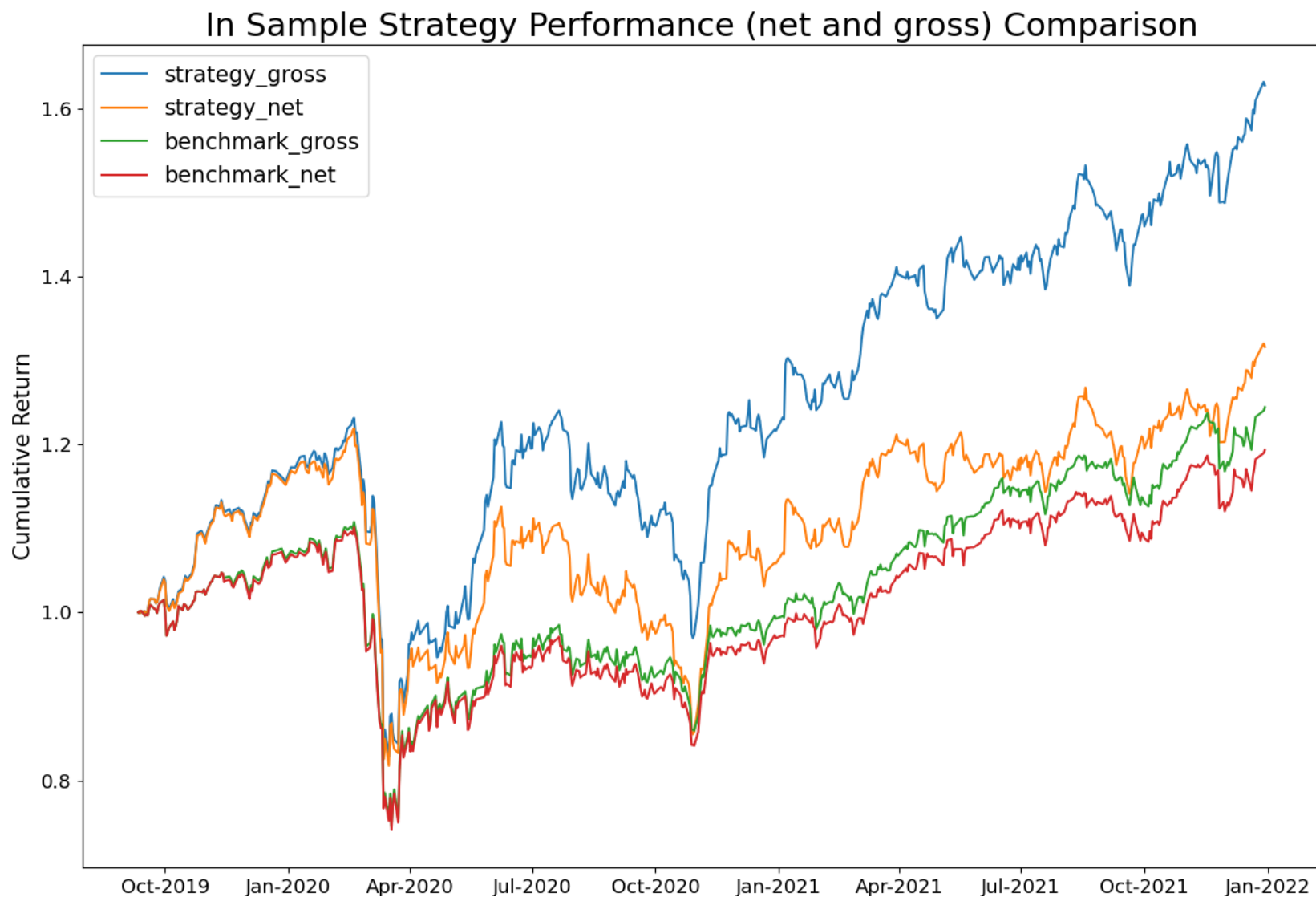
Stock Weights Strategy vs Index



Portfolio Characteristics

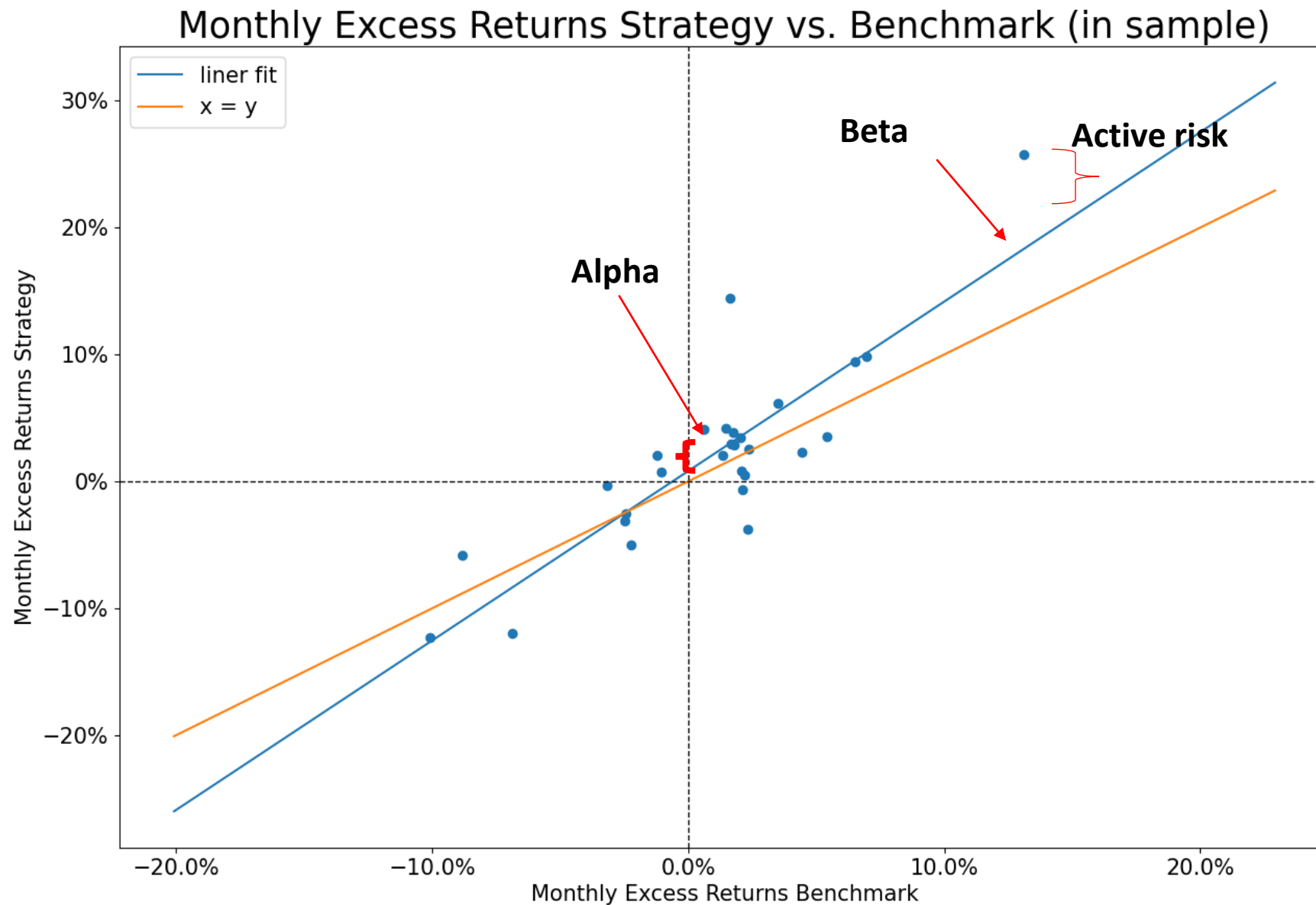
	Portfolio Short	Portfolio Long	Index
Yield	0.71%	6.61%	2.79%
Price_Book	4.06	1.74	6.36
Trailing_PE	34.52	12.56	22.02
Forward_PE	20.59	9.82	18.19

Backtesting Performance





Market Risk & Active Risks

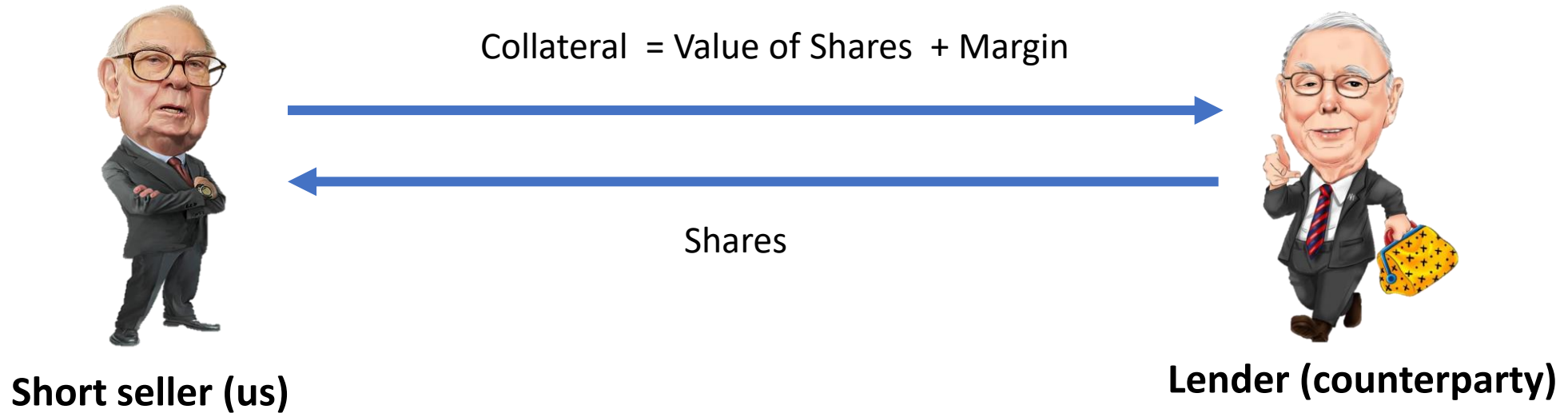


Characteristics & main Risks

- Risks from going short -> especially in high volatility high valued stocks
- Considering margin requirements
- Risk of short squeeze
- Interest rate risk
- Idiosyncratic risk
- Model Risk

	Benchmark	Strategy
Avg. Yearly Return	11.92%	24.59%
Avg. Yearly Sharp Ratio	0.57	1.03
Max. Drawdown	-32.72%	-32.74%
Alpha (monthly Returns)	0%	0.82%
Beta (monthly Returns)	1	1.34
Avg. Ann. Vol	20.81%	23.89%
5d 1% Hist. VAR	8.73%	7.21%

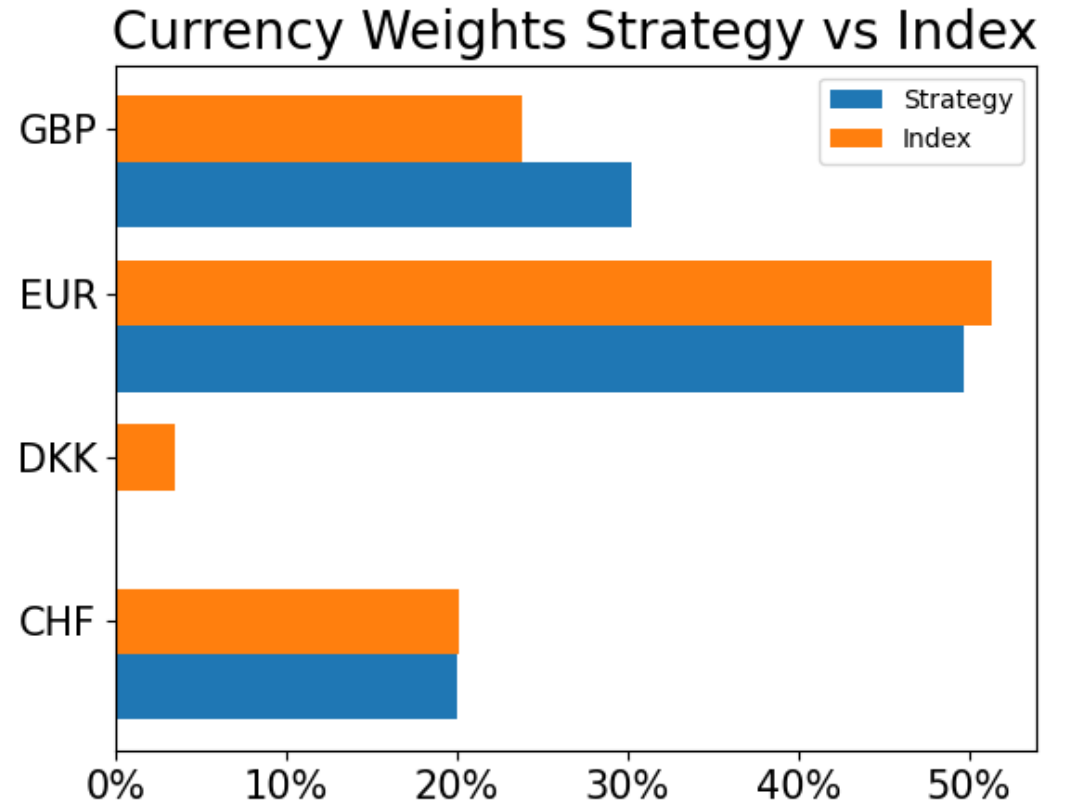
Counterparty Risk



Default of Counterparty:
→ Margin is lost due to one sided overcollateralization
In OTC Markets

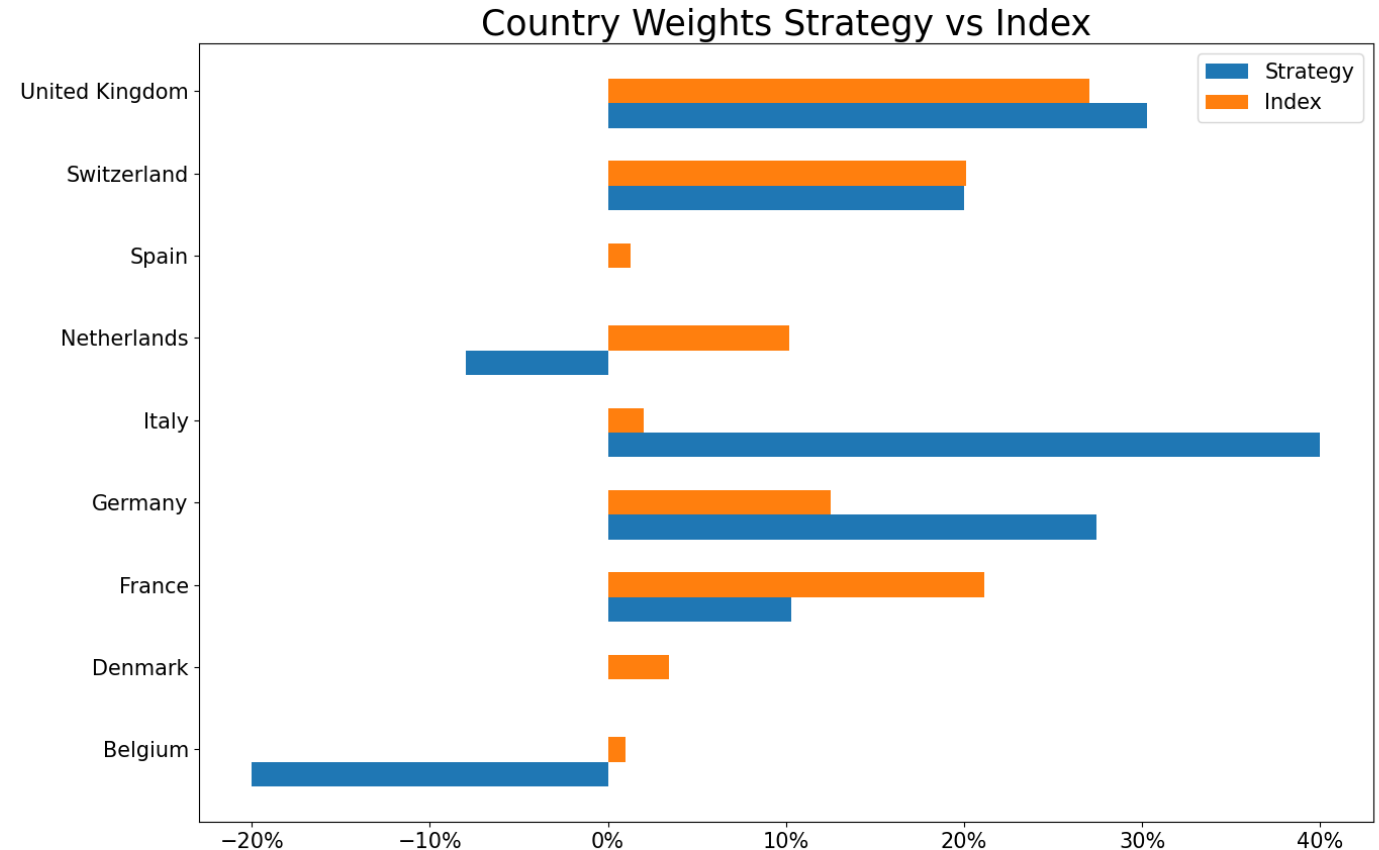
FX Risks

- Our FX Risk closely matches our Benchmark
- We only have slightly higher weights in the GBP compared to the Benchmark
- And no Danish crown risk



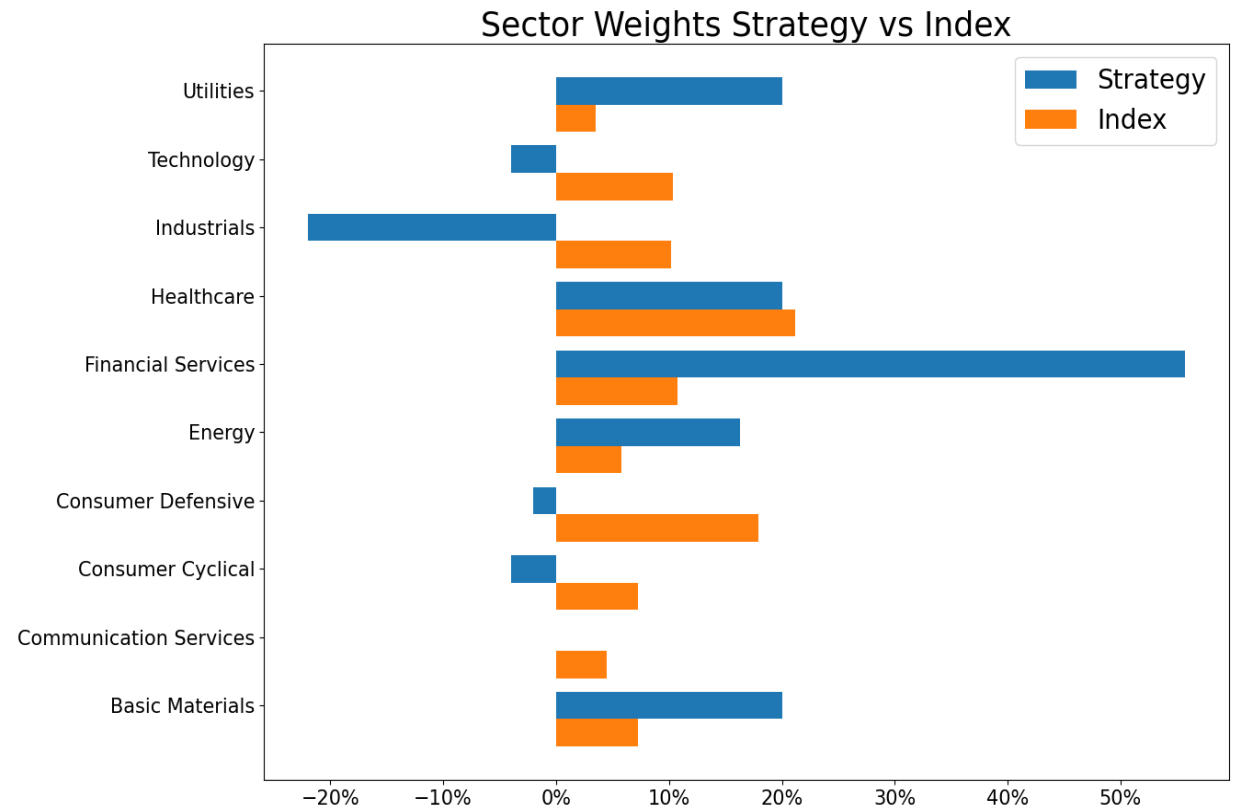
Concentration Risks (Countries)

- In contrast our country concentration risks is very different
- We have significant higher concentration in Italy as well as Germany
- Whereas a negative position in the Netherlands and Belgium



Concentration Risks (Sectors)

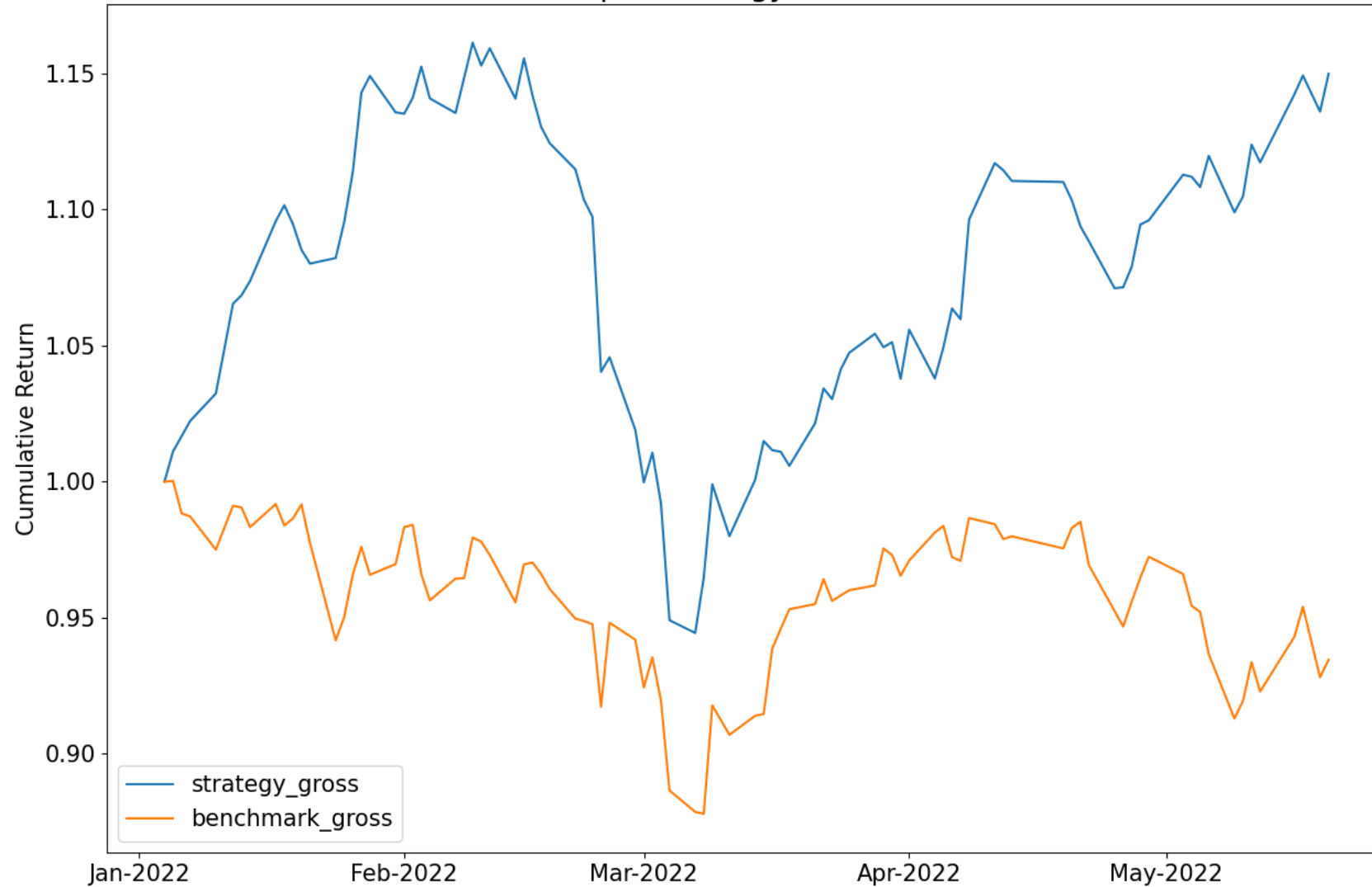
- Similarly Sector risk deviates from the Benchmark
- We have a negative position in Industrials and high above Benchmark position in Financials
- Idiosyncratic risk due to heavy weights in Financial Services



Out of Sample Performance



Out of Sample Strategy Performance (TR)



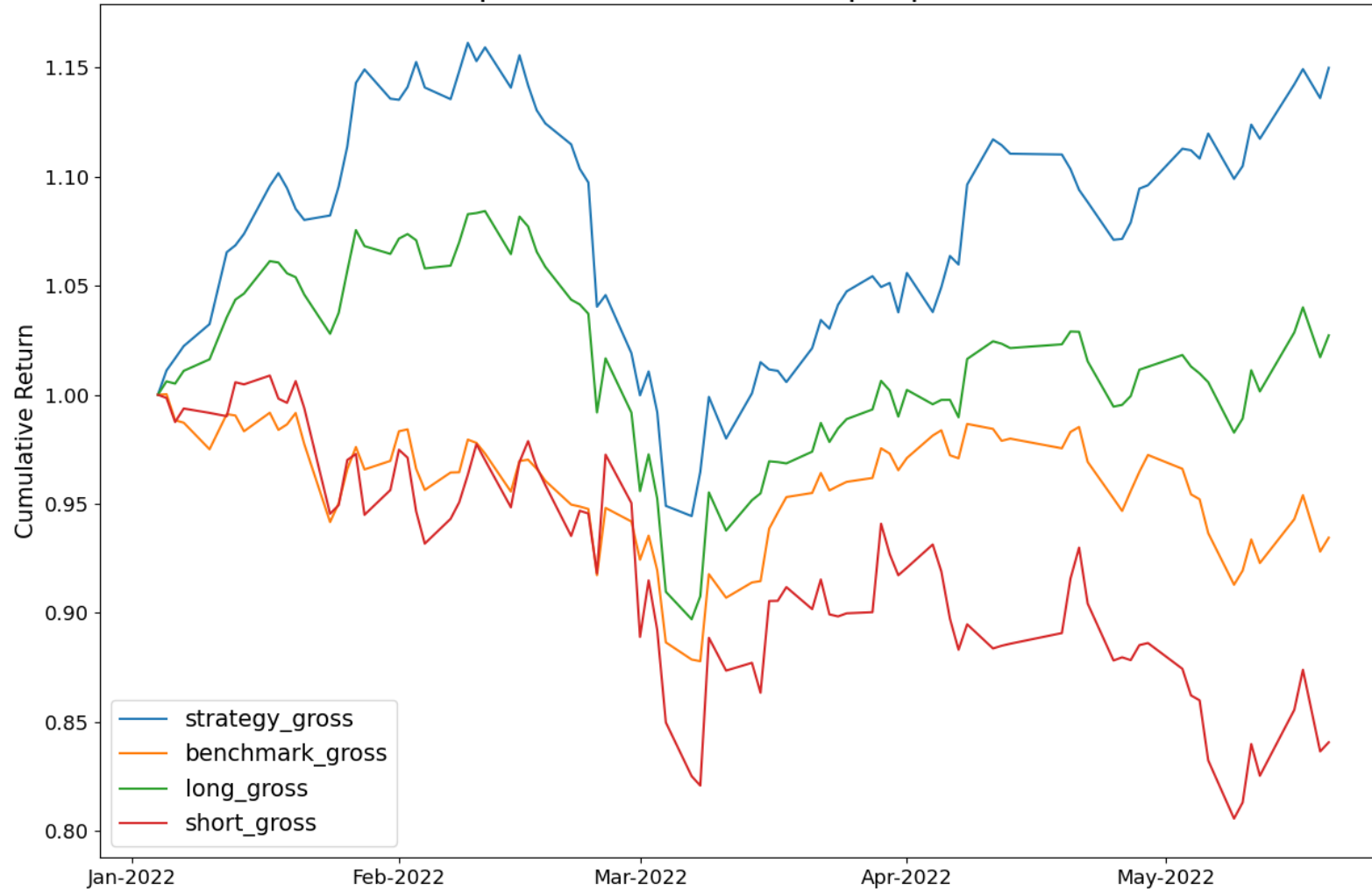
- Significant out of Sample outperformance against Benchmark
- Only slightly higher Volatility, 5d VAR, max Drawdown
- Significant Alpha and Superior Sharpe Ratio

	Benchmark	Strategy
Return YTD	-6.55%	14.99%
Avg. Yearly Sharp Ratio	-0.76	1.79
Max. Drawdown	-12.24%	-18.68%
Alpha (weekly Returns)	0%	1.06%
Beta (weekly Returns)	1	0.92
Avg. Ann. Vol	21.78%	23.17%
5d 1% Hist. VAR	5.00%	8.53%

What factors were responsible for the Outperformance?



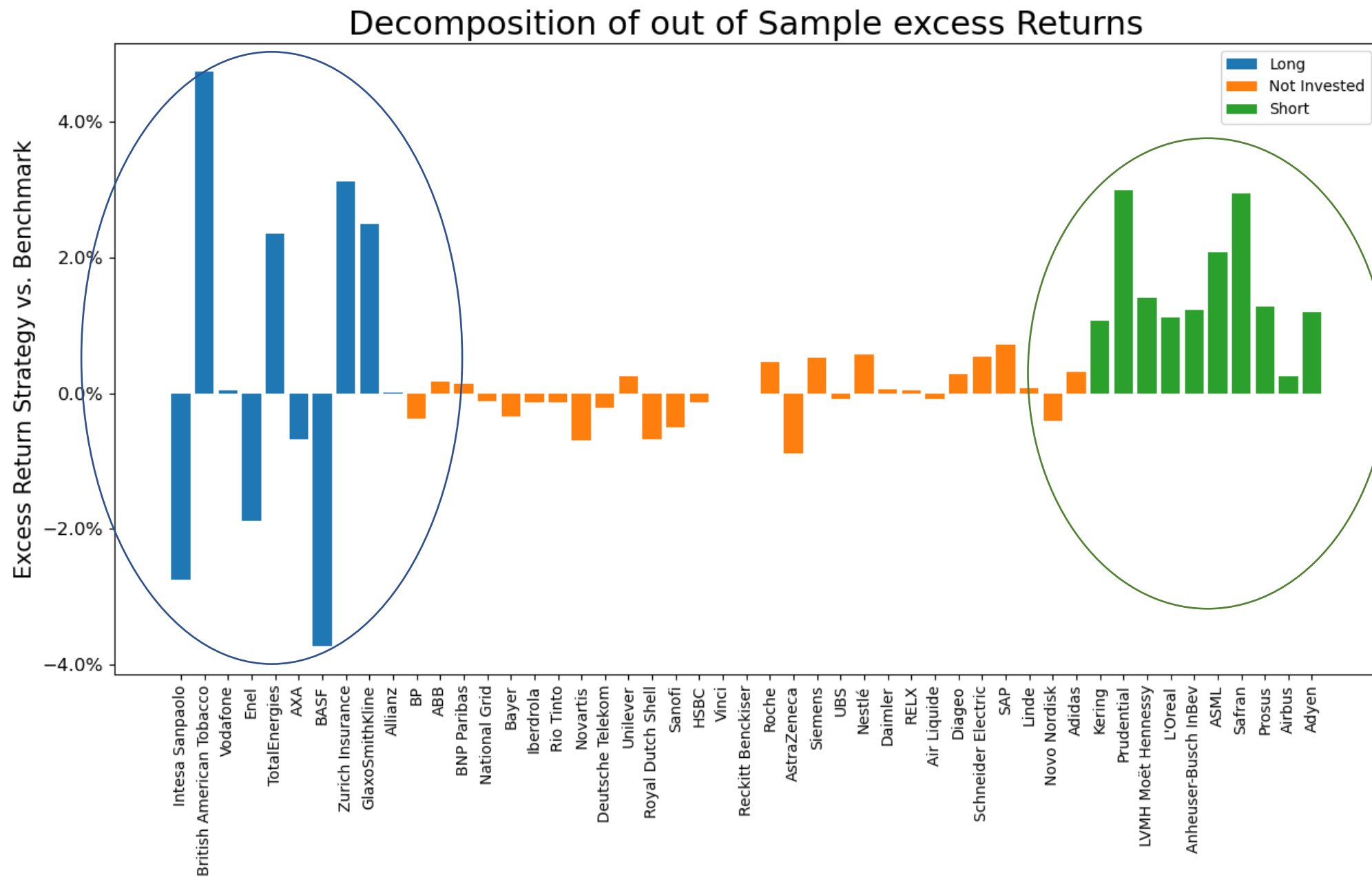
Decomposition of out of sample performance



- Stocks in long Portfolio overperformed against Benchmark
 - Stocks in short Portfolio underperformed against Benchmark
- Outperformance from **both long and short portfolios**

Highest Dividend Yield

lowest Dividend Yield



Summary

Investment Strategy aims to take advantage of

- 1.) Supposedly better performance of high dividend yield stocks (dogs of the Dow in US)
 - 2.) Expected correlation breakdown between highly valued (low dividend) and low valued (high dividend) stocks whereby high yield stocks outperform low yield stocks
- requires to continuously monitor outlook and can require rebalancing if assumptions change!
Rebalancing frequency / change of strategy should not be too frequent

Results:

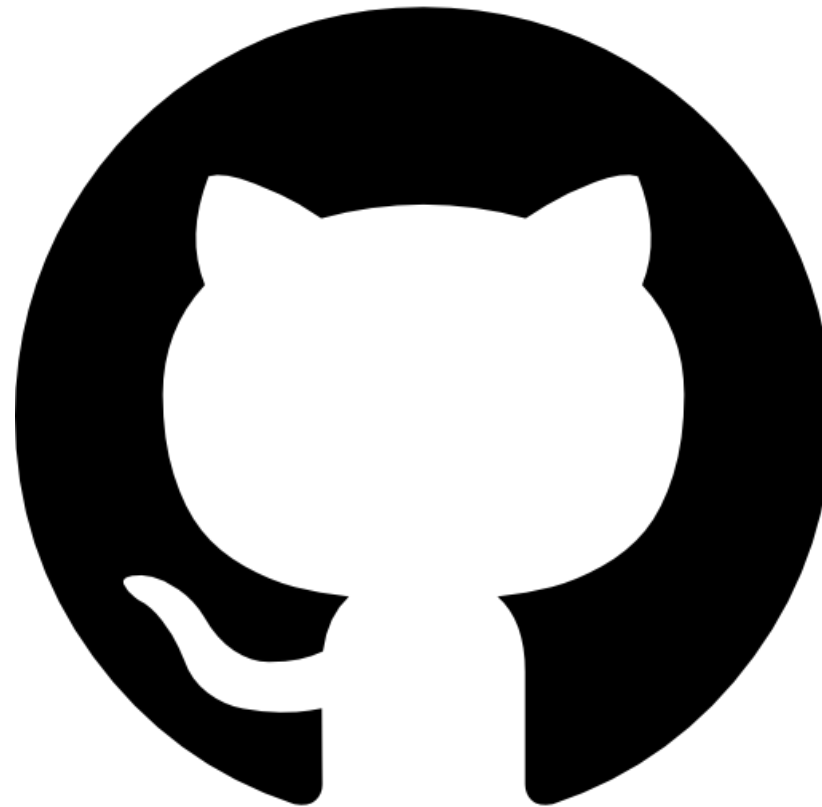
- Both of our assumptions were correct (1&2)
 - Implementing restrictions in our quantitative optimization was necessary.
- Otherwise, the optimizer would have favored those stocks which have performed extremely well in the past.

Risks:

- Better performance comes with higher risks such as:
- Liquidity risks from very large single name positions
 - Counterparty risks and higher potential losses from short selling
 - Higher risks from high concentration in some industries and countries

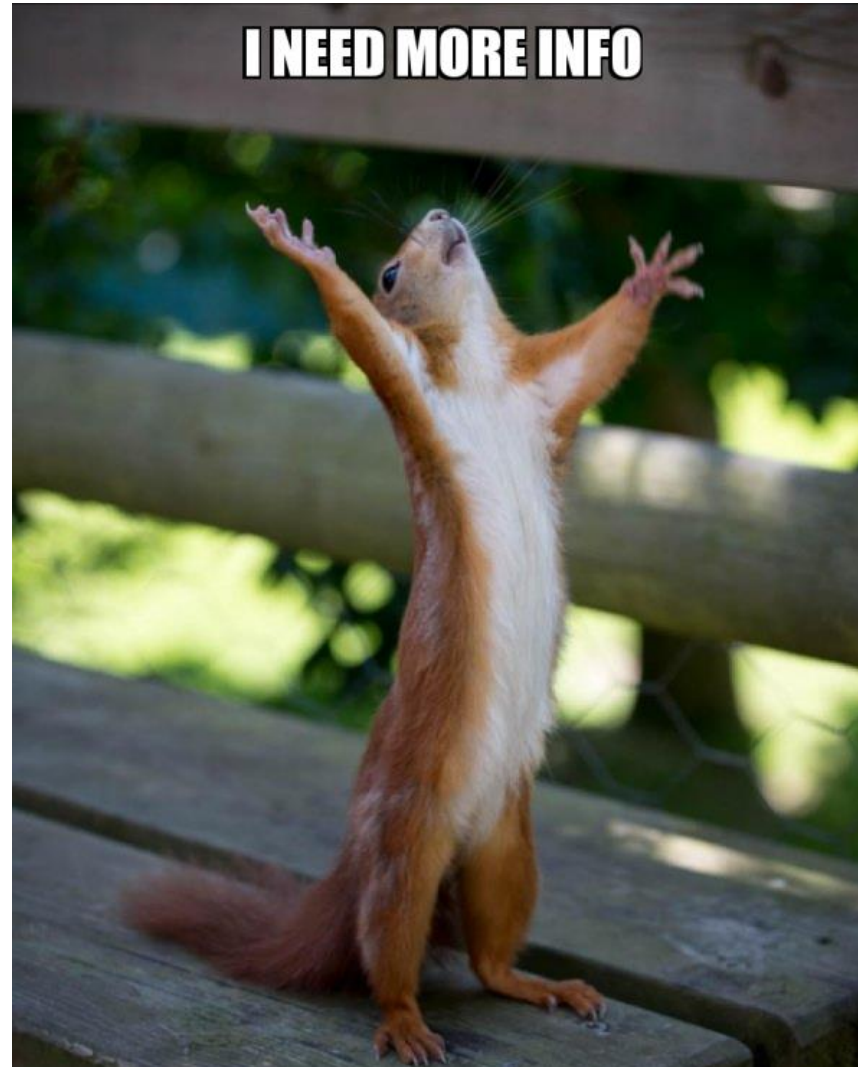


Source Code:



https://github.com/svensglinz/Investments_Project

Additional Slides



Excess Return Contribution of Individual Stocks

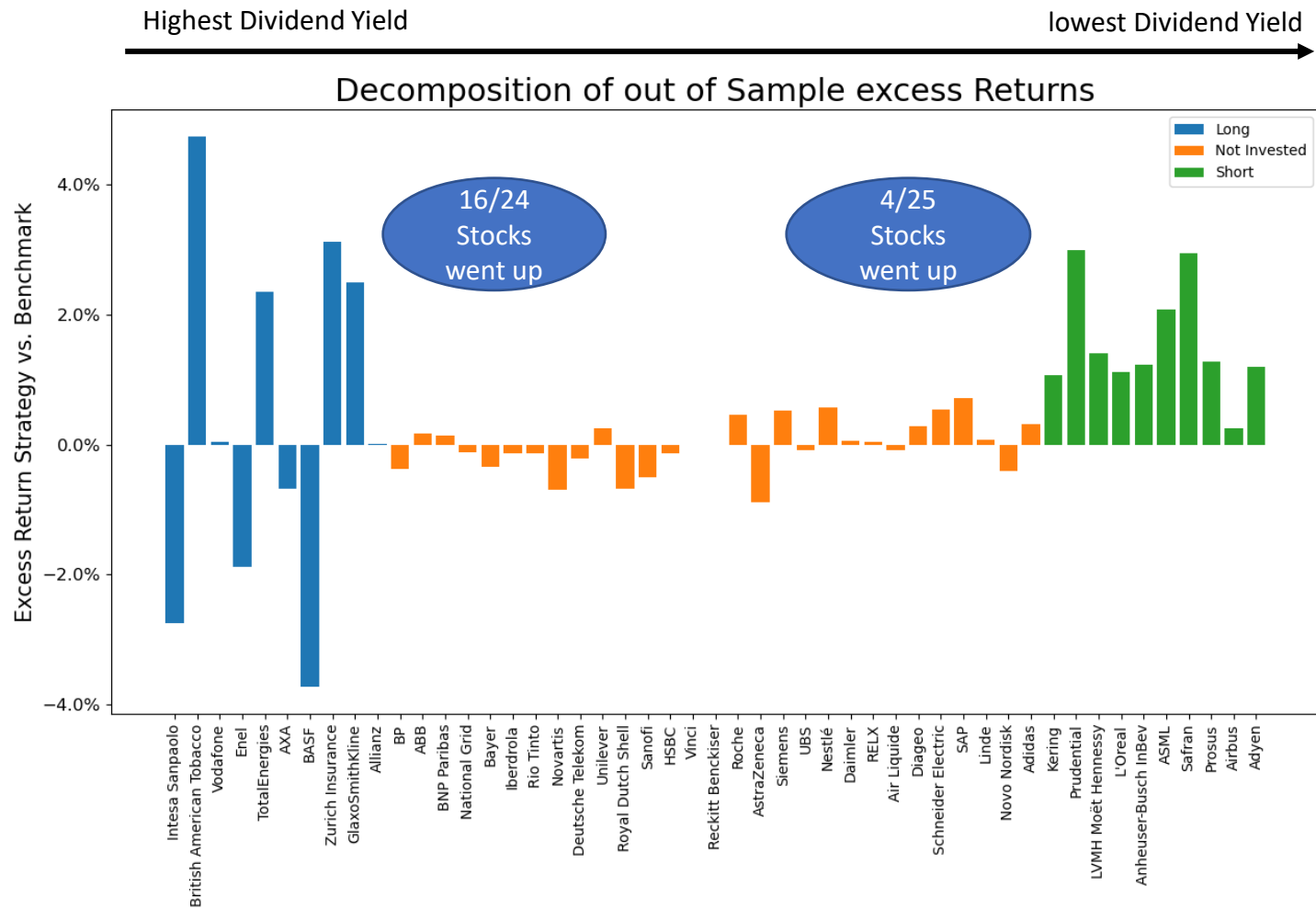
$i = \text{stocks in Benchmark}$ 1.) $\sum_{\forall i} r_i * w_{\text{benchmark},i} = r_{\text{benchmark}}$ 2.) $\sum_{\forall i} r_i * w_{\text{strategy},i} = r_{\text{strategy}}$



$$\underbrace{r_{\text{strategy}} - r_{\text{benchmark}}}_{\text{Excess Return}} = \sum_{\forall i} \underbrace{(w_{\text{strategy},i} - w_{\text{benchmark},i})}_{\text{Weight Difference}} * r_i$$



Next slide

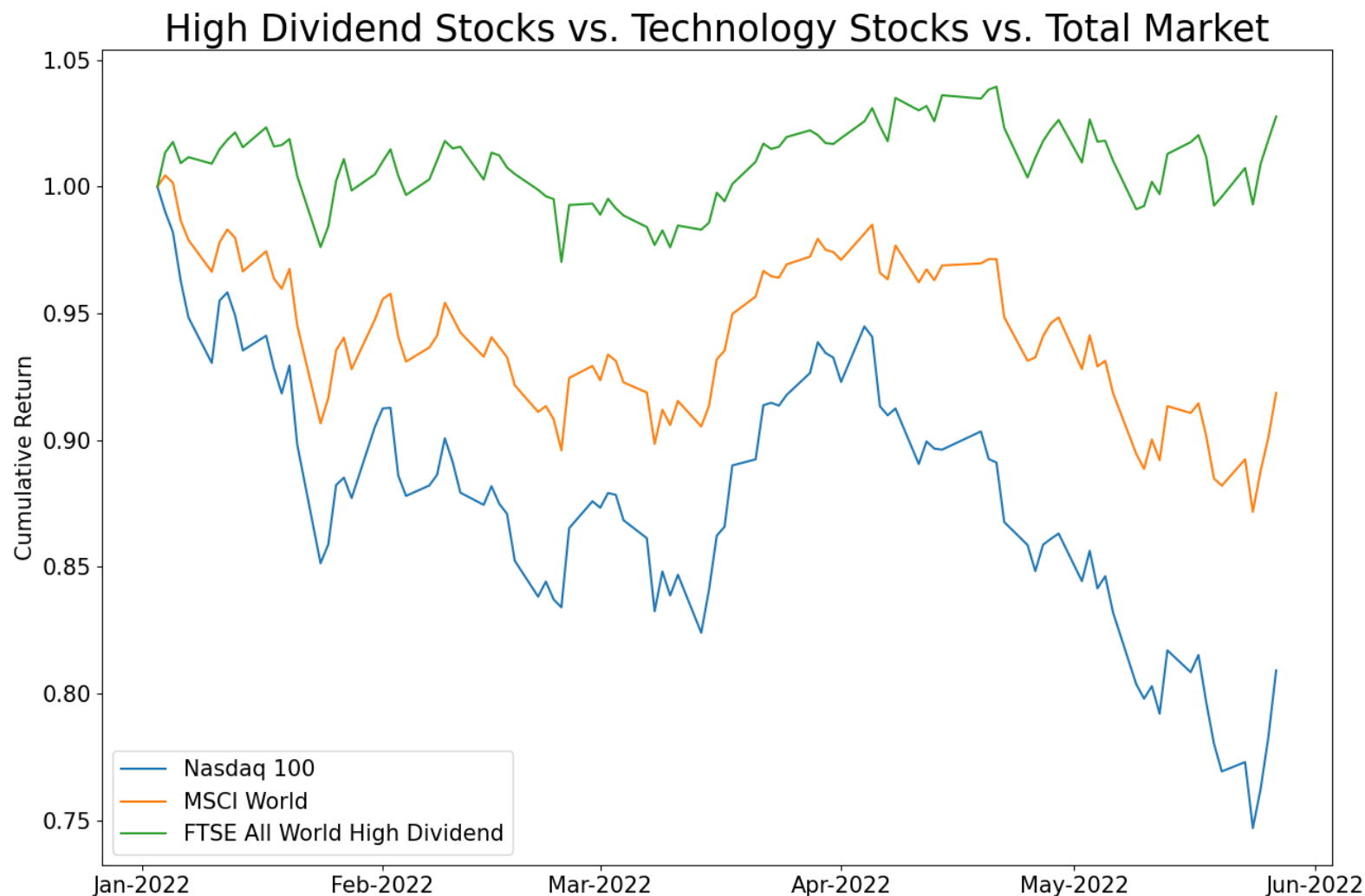


Interesting:

most of the index constituents in the upper half (sorted by dividend yield) increased in value → Negative excess return from stocks that we did not invest in → We “lost out” on their good performance whereas the Benchmark profited by investing in them

Most of the index constituents in the lower half (sorted by dividend yield) decreased in value → Positive excess return from stocks that we did not invest in → We outperformed the benchmark since we were “lucky enough” not to invest in stocks that decreased in value

Was our trend guess correct?



Outperformance of High Dividend vs. Low Dividend Stocks (as approximated by Nasdaq 100) in out of sample period is not only observable in our Benchmark but also Worldwide

Relative Correlation out of Sample / In Sample

All stocks showed a positive correlation in in-sample period!

High Yield stocks

Low Yield stocks

High yield stocks

Low yield stocks

	ISP.MI	BATS.L	VOD.L	ENEL.MI	TTE.PA	CS.PA	BAS.DE	ZURN.SW	GSK.L	ALV.DE	KER.PA	PRU.L	MOH.F	LOR.F	ABI.BR	ASML.AS	SAF.PA	PRX.AS	AIR.PA	ADYEN.AS
ISP.MI	1	1.09434	0.86979	1.18178	0.71859	1.25026	1.2564	0.81664	1.41523	1.12812	1.35595	1.13775	1.27227	1.40983	1.14282	1.6029	1.32702	2.28192	1.31825	1.98197
BATS.L	1.09434	1	0.93748	0.85521	1.07533	0.74386	0.88812	0.7913	1.0657	0.91688	1.03331	0.90116	1.28179	0.43244	1.06234	1.1171	0.86599	0.96592	1.04118	1.52812
VOD.L	0.86979	0.93748	1	0.78248	0.53328	0.78974	0.70127	0.72744	0.91808	0.69041	0.72707	0.57835	0.8177	0.86944	0.69598	0.88108	0.74868	0.32186	0.6843	1.23149
ENEL.MI	1.18178	0.85521	0.78248	1	0.64664	0.9524	1.09783	0.73963	1.00843	0.945	1.23223	1.23912	1.38472	1.01022	0.99816	1.10427	1.43851	1.08927	1.43802	1.39183
TTE.PA	0.71859	1.07533	0.53328	0.64664	1	0.69416	0.69841	0.65361	1.14495	0.71628	0.71387	0.68073	0.73875	0.5545	0.54983	0.84364	0.71067	0.85867	0.96756	2.43048
CS.PA	1.25026	0.74386	0.78974	0.9524	0.69416	1	1.19588	0.88558	1.15276	0.98261	0.97406	0.83073	0.94118	0.97033	0.84529	1.1968	1.10931	1.17508	1.21608	1.79918
BAS.DE	1.2564	0.88812	0.70127	1.09783	0.69841	1.19588	1	0.85038	0.97096	1.00134	1.17424	1.0441	1.25216	1.32982	1.01938	1.19452	1.32948	1.92797	1.27444	3.49828
ZURN.SW	0.81664	0.7913	0.72744	0.73963	0.65361	0.88558	0.85038	1	1.19906	0.81023	0.67734	0.6905	0.70248	0.8918	0.76301	0.87401	0.78297	0.81544	0.90728	1.19294
GSK.L	1.41523	1.0657	0.91808	1.00843	1.14495	1.15276	0.97096	1.19906	1	1.18314	1.28078	1.1182	1.05147	0.73304	1.1938	0.99342	0.91297	0.52062	1.31385	1.21176
ALV.DE	1.12812	0.91688	0.69041	0.945	0.71628	0.98261	1.00134	0.81023	1.18314	1	0.97351	0.8768	0.95869	1.13512	0.96577	1.20354	0.98535	1.47282	1.1885	1.78653
KER.PA	1.35595	1.03331	0.72707	1.23223	0.71387	0.97406	1.17424	0.67734	1.28078	0.97351	1	1.15613	0.99707	1.39286	1.10828	1.40753	1.12814	1.65601	1.16906	2.09985
PRU.L	1.13775	0.90116	0.57835	1.23912	0.68073	0.83073	1.0441	0.6905	1.1182	0.8768	1.15613	1	1.16644	1.21191	1.05387	1.435	1.09419	1.33345	1.06351	2.14287
MOH.F	1.27227	1.28179	0.8177	1.38472	0.73875	0.94118	1.25216	0.70248	1.05147	0.95869	0.99707	1.16644	1	1.15379	1.11104	1.14037	1.20817	1.32337	1.2415	1.80448
LOR.F	1.40983	0.43244	0.86944	1.01022	0.5545	0.97033	1.32982	0.8918	0.73304	1.13512	1.39286	1.21191	1.15379	1	1.13015	1.5279	1.39094	1.41793	1.64623	1.86339
ABI.BR	1.14282	1.06234	0.69598	0.99816	0.54983	0.84529	1.01938	0.76301	1.1938	0.96577	1.10828	1.05387	1.11104	1.13015	1	1.37164	1.08352	1.23446	1.06705	2.55456
ASML.AS	1.6029	1.1171	0.88108	1.10427	0.84364	1.1968	1.19452	0.87401	0.99342	1.20354	1.40753	1.435	1.14037	1.5279	1.37164	1	1.47084	1.21405	1.48537	1.28873
SAF.PA	1.32702	0.86599	0.74868	1.43851	0.71067	1.10931	1.32948	0.78297	0.91297	0.98535	1.12814	1.09419	1.20817	1.39094	1.08352	1.47084	1	1.80015	1.03576	2.26992
PRX.AS	2.28192	0.96592	0.32186	1.08927	0.85867	1.17508	1.92797	0.81544	0.52062	1.47282	1.65601	1.33345	1.32337	1.41793	1.23446	1.21405	1.80015	1	1.90437	1.17773
AIR.PA	1.31825	1.04118	0.6843	1.43802	0.96756	1.21608	1.27444	0.90728	1.31385	1.1885	1.16906	1.06351	1.2415	1.64623	1.06705	1.48537	1.03576	1.90437	1	2.00365
ADYEN.AS	1.98197	1.52812	1.23149	1.39183	2.43048	1.79918	3.49828	1.19294	1.21176	1.78653	2.09985	2.14287	1.80448	1.86339	2.55456	1.28873	2.26992	1.17773	2.00365	1

Some stocks fell together with low yield stocks (increase or no change in correlation) whereas other stocks rose or did not fall much (decrease in correlation)

All stocks fell → Increase in correlation



Main Takeaway: Past expected returns and correlations must not necessarily predict future



**Past performance is not
indicative of future results!**

SEC Rule 156

Do your own research, build your opinions and
understand your investment risk.