



ROBERT H. SMITH  
SCHOOL OF BUSINESS

# **OPTIMIZING PORTFOLIO INSIGHTS: TOOLS FOR MONITORING, ATTRIBUTION, AND RISK CONTROL**

**Project Client: Mayer Fund at the University of Maryland  
Faculty Advisor: Professor George Gao**

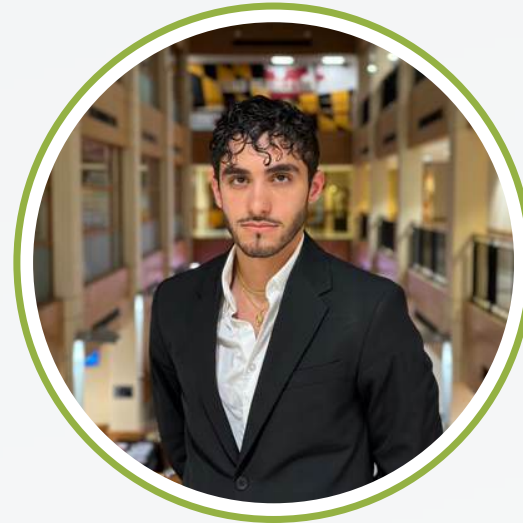
# MEET THE TEAM



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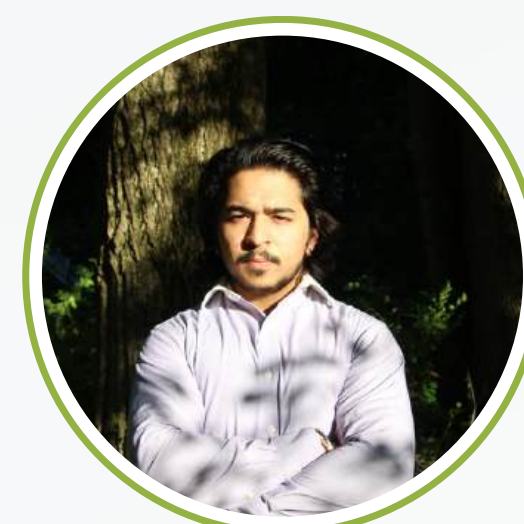
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Qingyue Liu



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# **OBJECTIVES & MOTIVATIONS**

# AGENDA

1

MONITOR MARKET CONDITIONS BY ANALYZING STOCK CORRELATION, RETURN DISPERSION, AND CONCENTRATION TRENDS WITHIN THE S&P 500.

3

ASSESS THE IMPACT OF STOCK CONCENTRATION ON MARKET DYNAMICS THROUGH QUANTITATIVE MEASURES LIKE HHI.

2

EVALUATE SECTOR-SPECIFIC AND OVERALL MARKET PERFORMANCE USING HISTORICAL RETURN DATA AND CORRELATION METRICS.

4

ANALYSYE THE MAYER FUND PORTFOLIO AND ITS PERFORMANCE AGAINST RELAVANT BENCHMARK AND DECODE ITS RISK AND ATTRIBUTION CHARACTERISTICS

# PROJECT SCOPE

## Market Condition Analysis

Pairwise correlations  
Return dispersion, and  
concentration trends  
across the S&P 500 and  
GLCS sectors.

## Sector Performance and Crowding

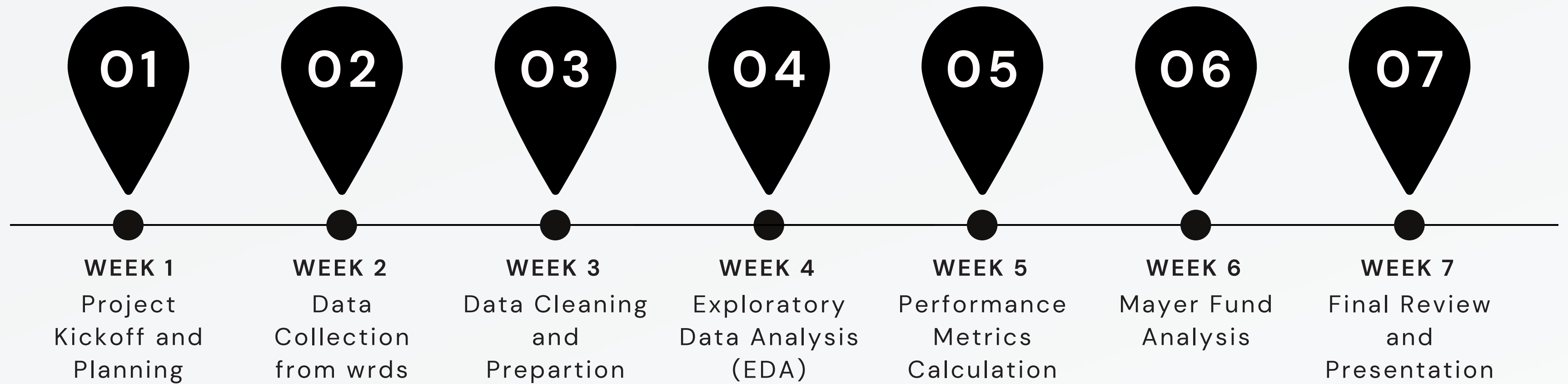
Investigate the relationship  
between sector-specific  
performance and market  
crowding using quantitative  
metrics like Z-scores and  
the HHI.

## Volatility and Concentration Trends

Provide insights into market  
volatility and concentration  
by tracking historical trends  
in stock performance and  
sectoral allocations.



# PROJECT TIMELINE





# DATA SOURCES



- Compustat North America: Provides comprehensive financial data on U.S. public companies.
- Refinitiv/LSEG: Used for advanced analytics, performance attribution, sector analysis, and risk models.

**WRDS**



Mayer Fund Transaction Records:

- Current Holdings
- Recent 4 years of transactions
- Earlier Transaction History

**HISTORICAL  
HOLDINGS DATA**



S&P 500 Index: Benchmark for performance comparison, necessary for calculating cross-sectional dispersion and pairwise correlations.

**MARKET INDICES**



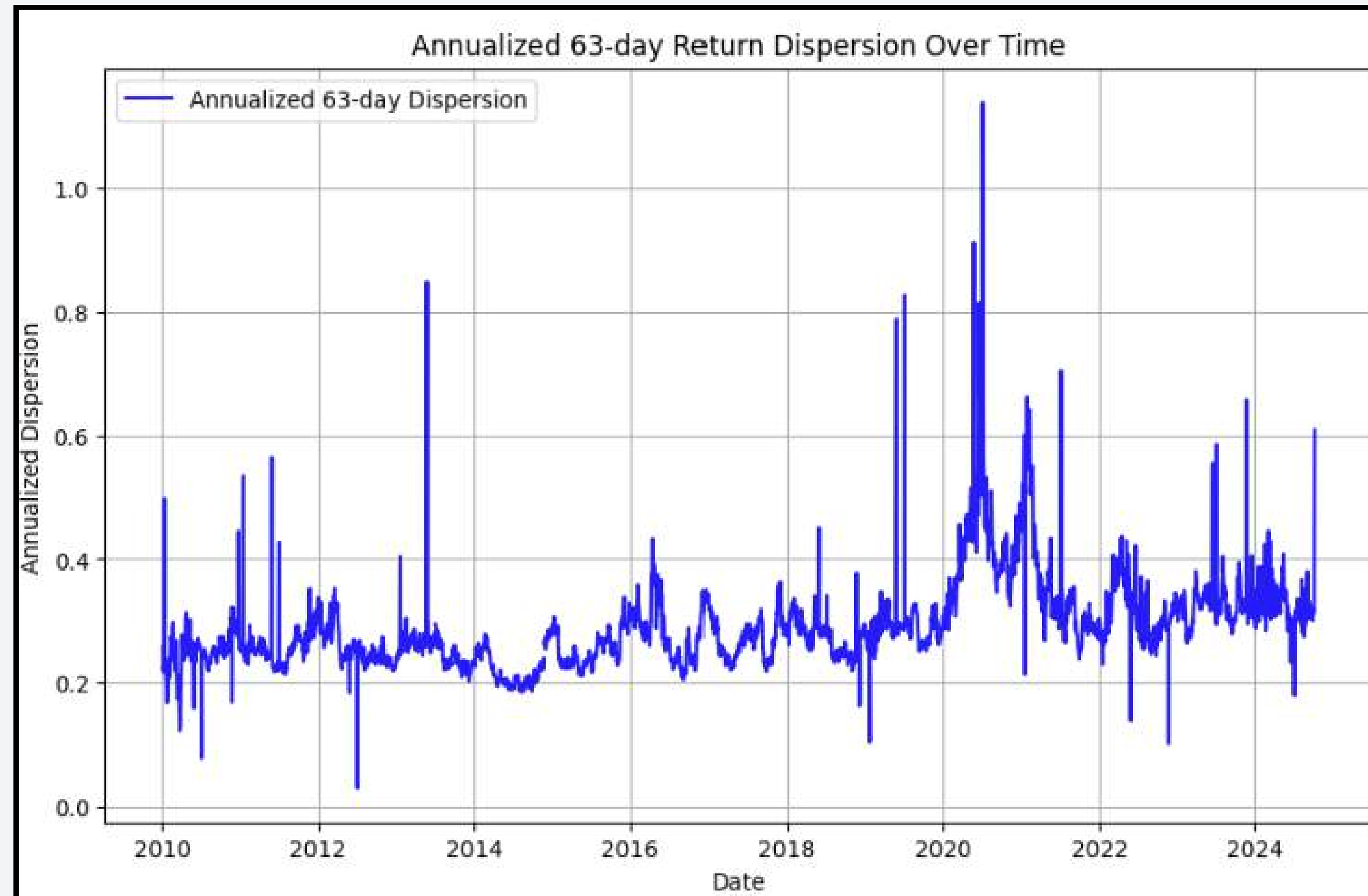
# **MARKET ANALYSIS**

# S&P 500 ANALYSIS

Cross-sectional  
Return Dispersion

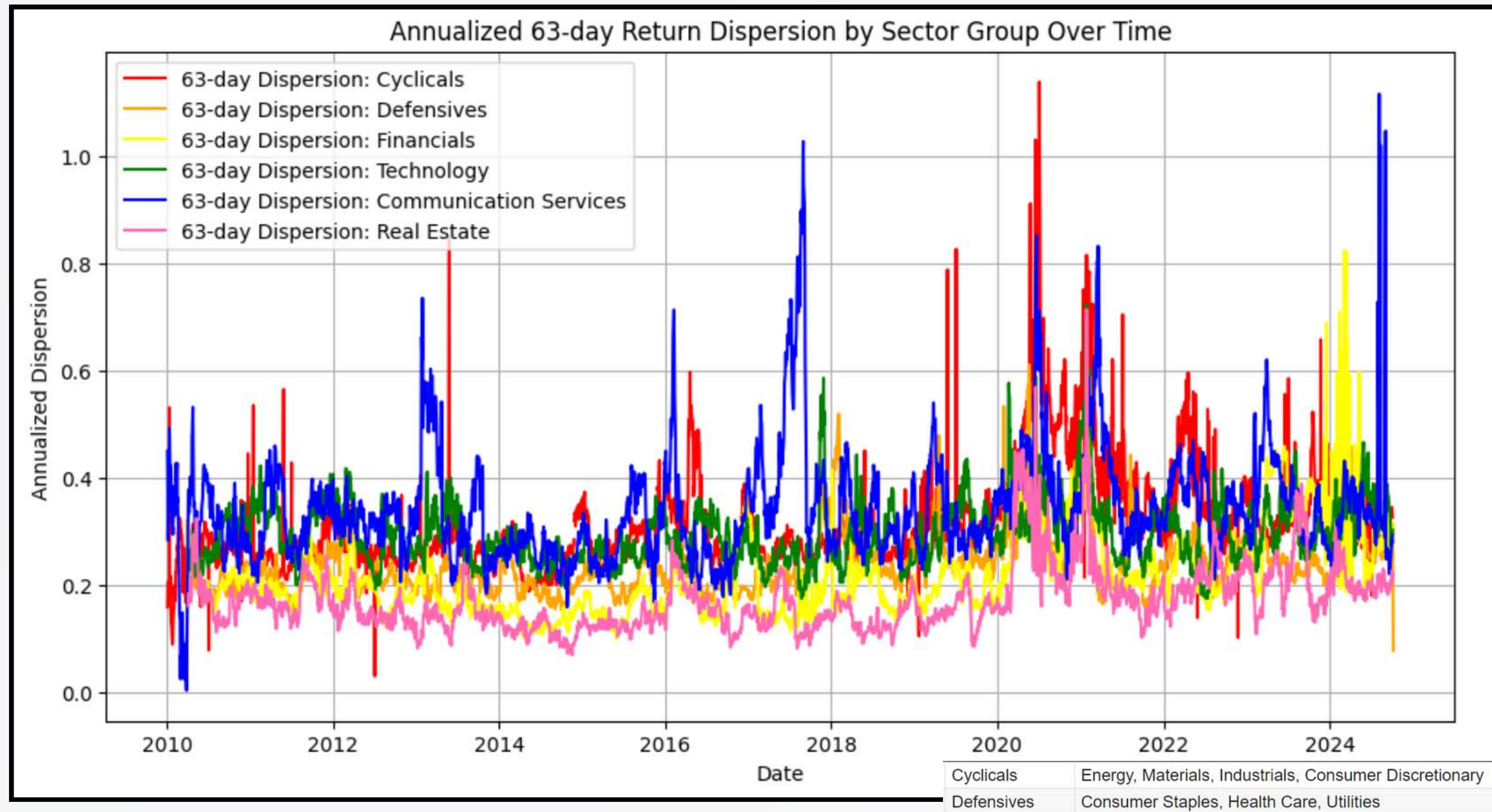
Pairwise Return  
Correlation

Performance and  
Concentration  
Trends

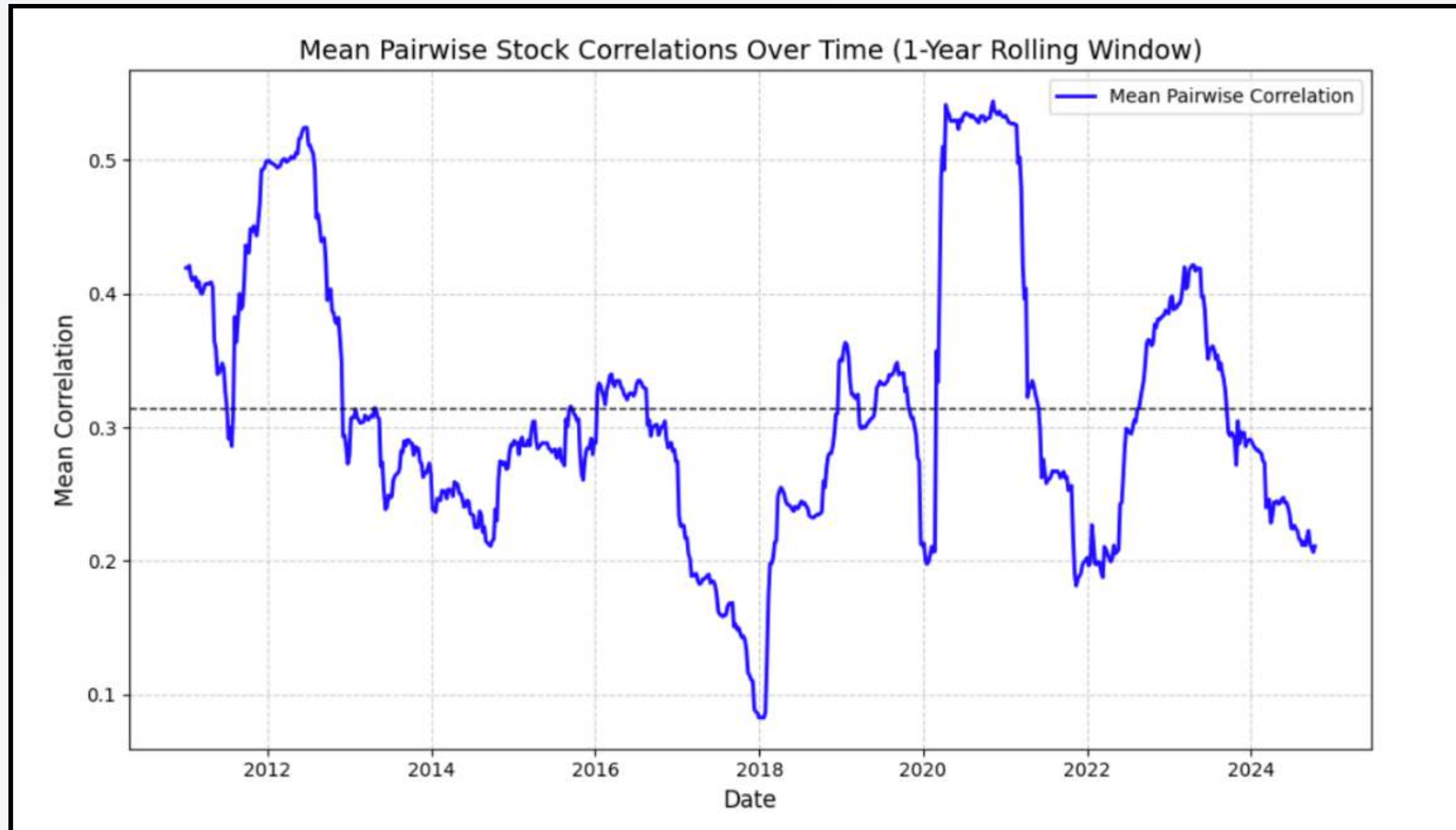


Pre-Pandemic Dispersion **LESS** than post-Pandemic.



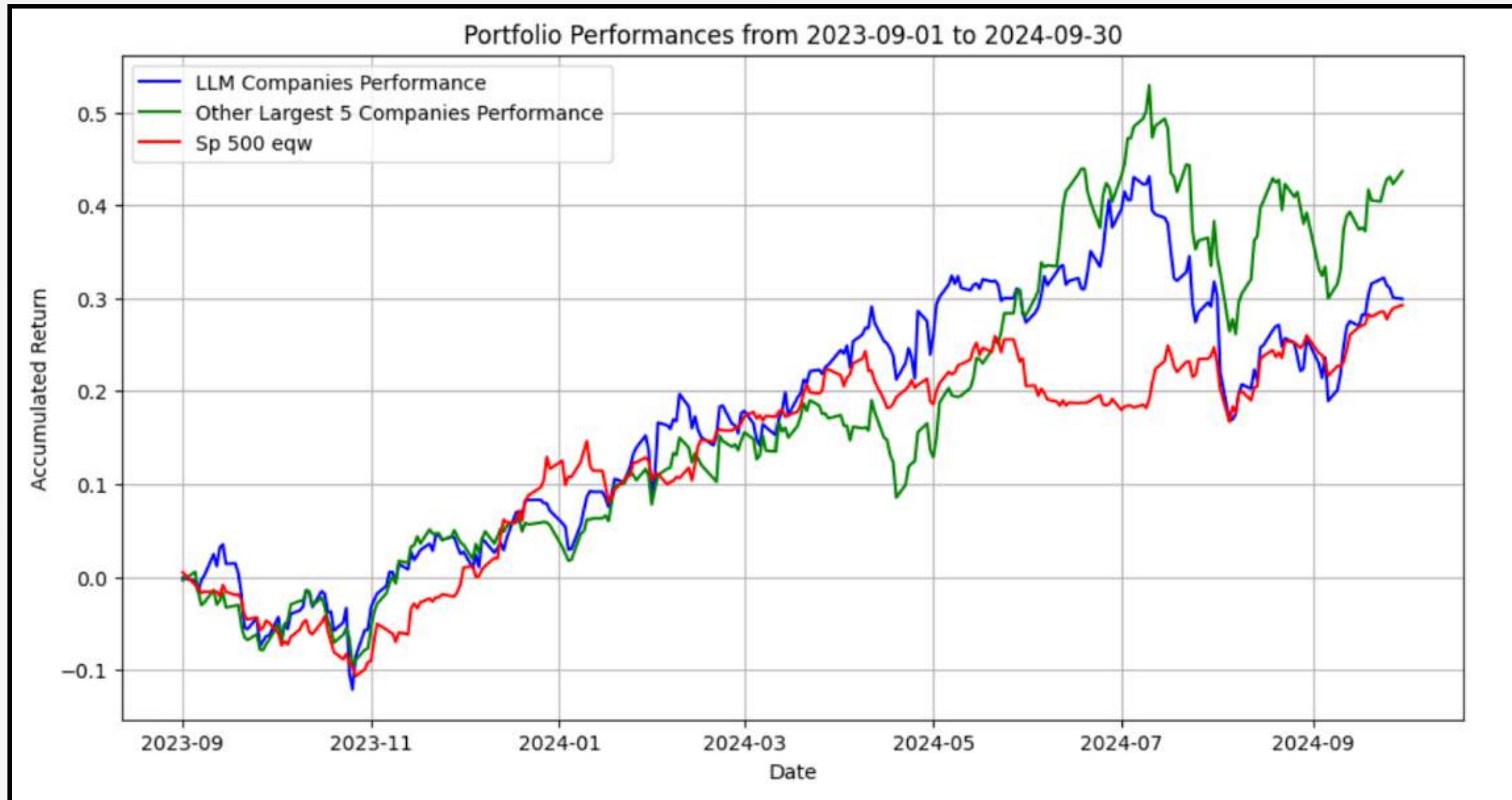


- Dispersion Leaders - Energy, Financial and Communication Services.
- Actively managing position in these sectors can produce profits.

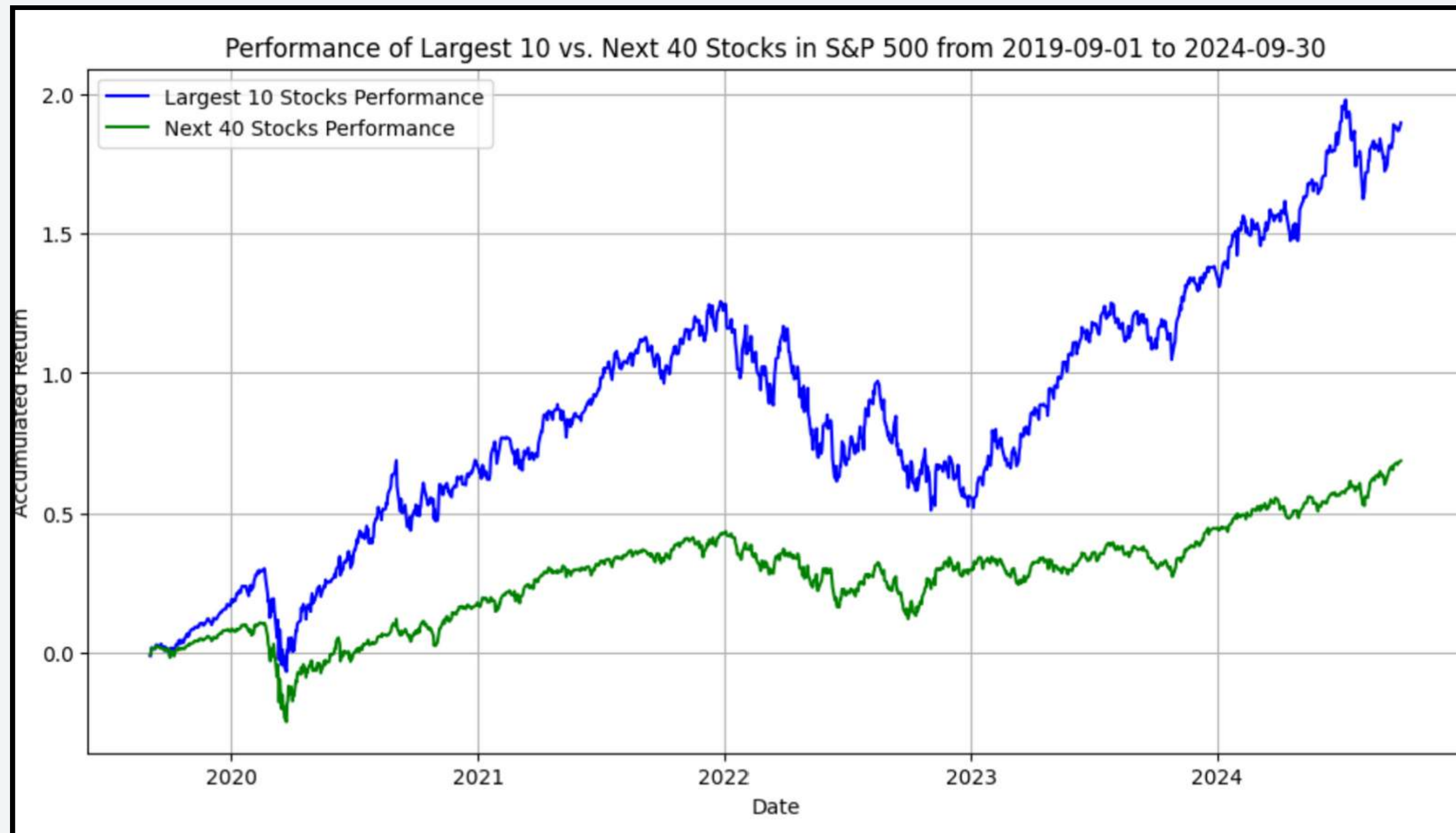


- High correlation usually means government intervention.
- Lower correlation means **less** diversification benefit.



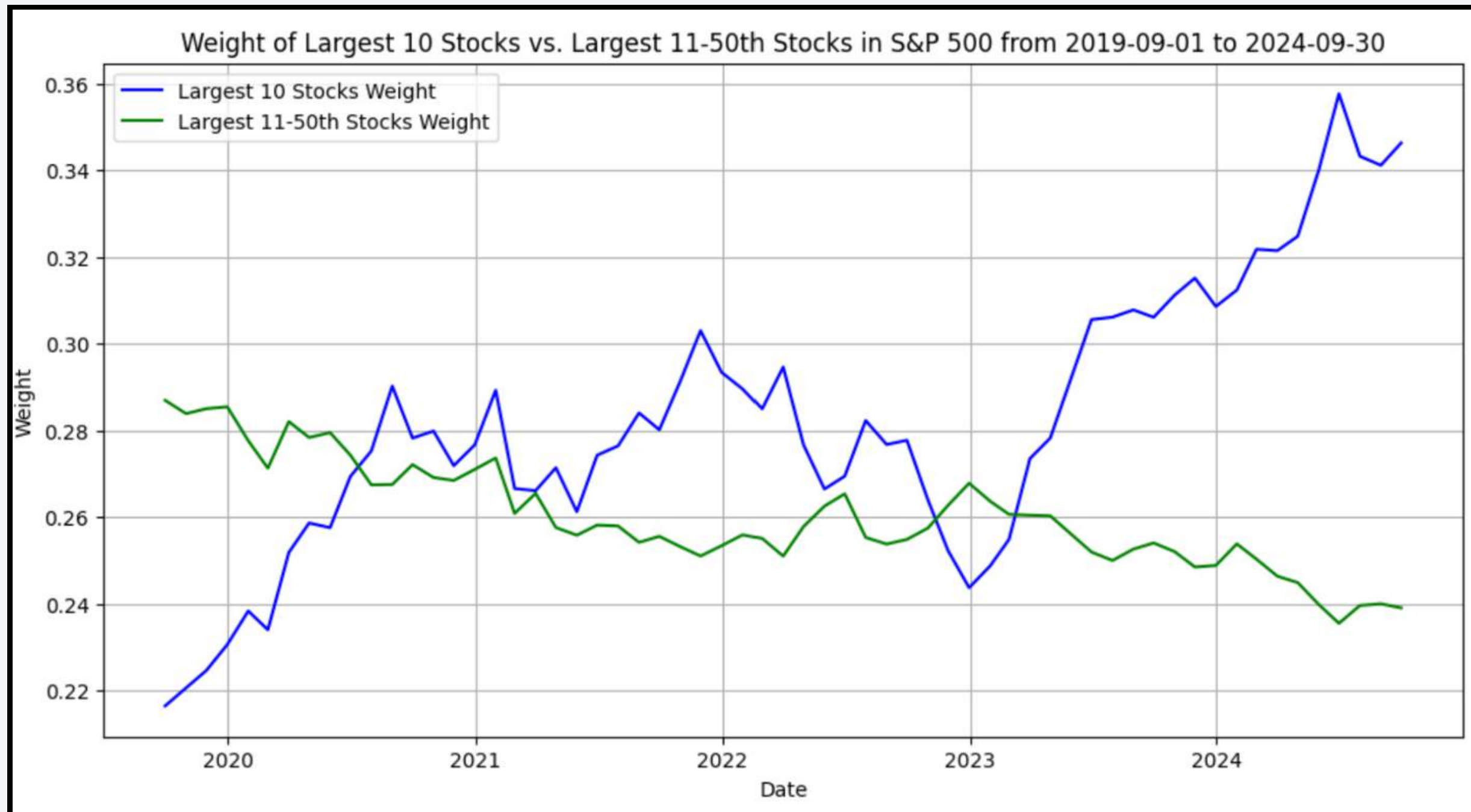


- Opportunity to invest in non LLM stock.



Performance difference of 120% over 5 years.





- Largest 10 stocks weights 35% of SPY
- Largest 11-50 weight 24%
- Increased Risk



# **ANALYSING MAYER FUND PERFORMANCE**

# PORTFOLIO FUND ANALYTICS OVERVIEW

## MAYER FUND

- AUM \$7,991,094
- Equity \$7,551,730

## PORTFOLIO ANALYTICS

- Data as of Sep 16, 2024
- Benchmark Invesco S&P 500 GARP ETF
- Focus equity only

## INVESTMENT POLICY

- Philosophy GARP
- No one stock > 5%
- No one stock < 3 analysts coverage
- Market cap > \$5m
- Sector Allocation similar to S&P 500


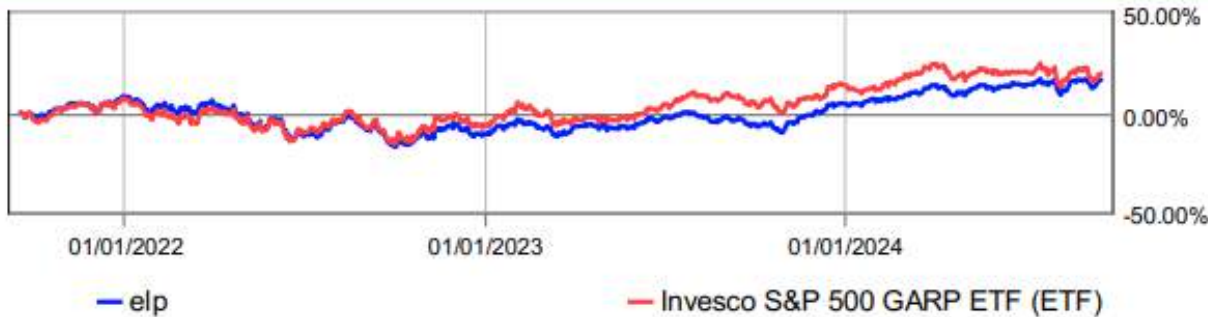
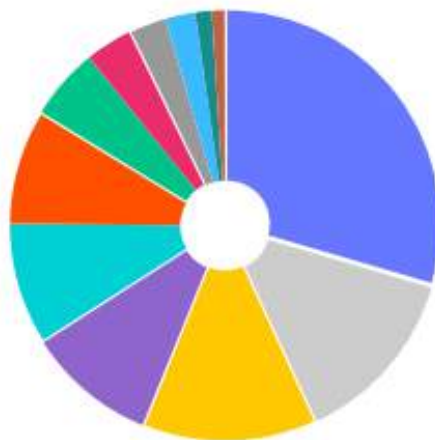
## PROCESS

1. Backfill transactions data with current holding.
2. Combined all positions and price data for each month till 2015.
3. Using LSEG Portfolio Analytics function and risk model to run analysis(YTD, 3YR, 5YR).

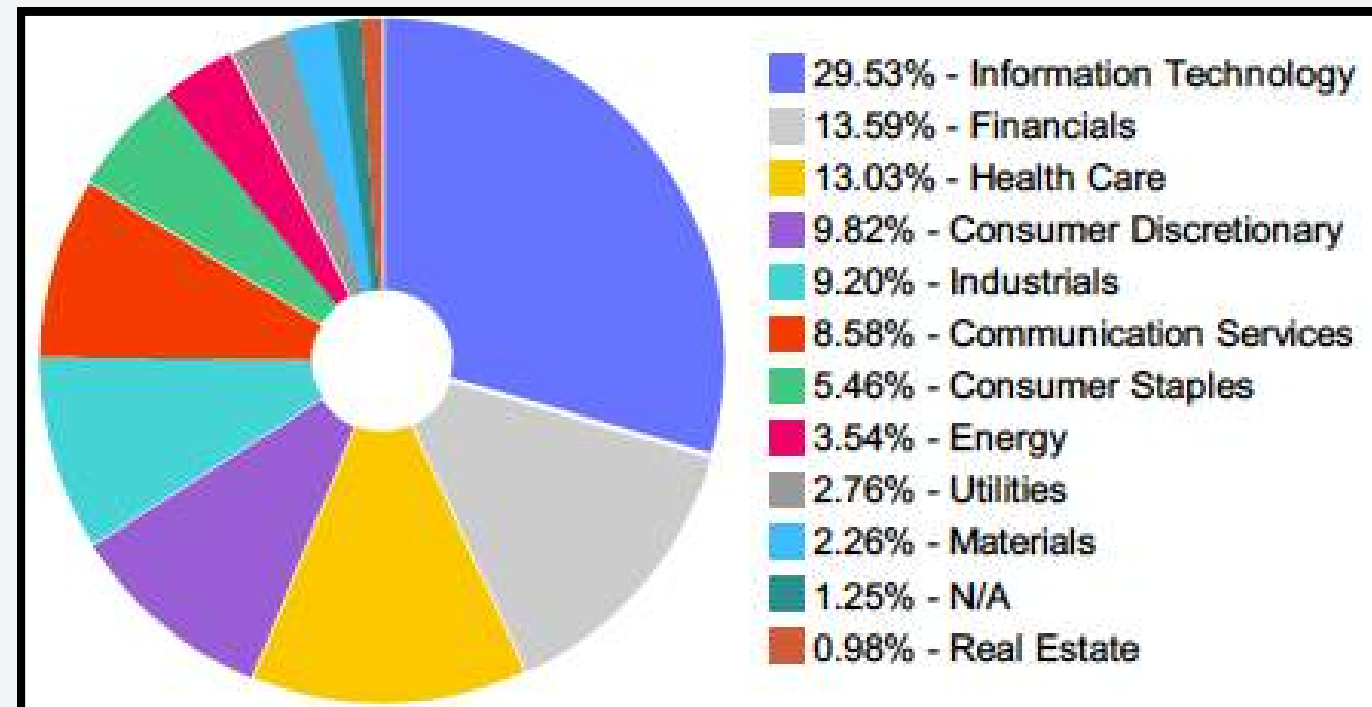




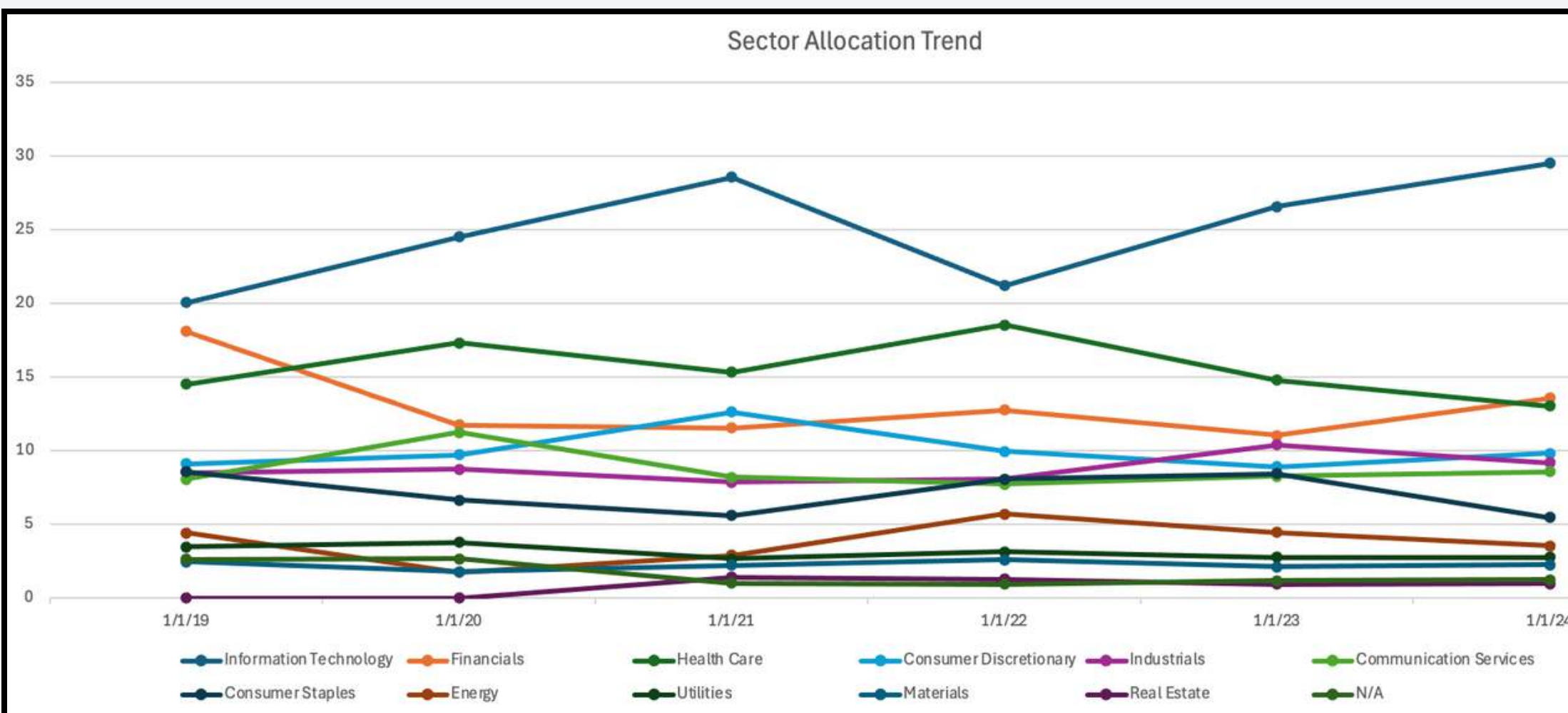
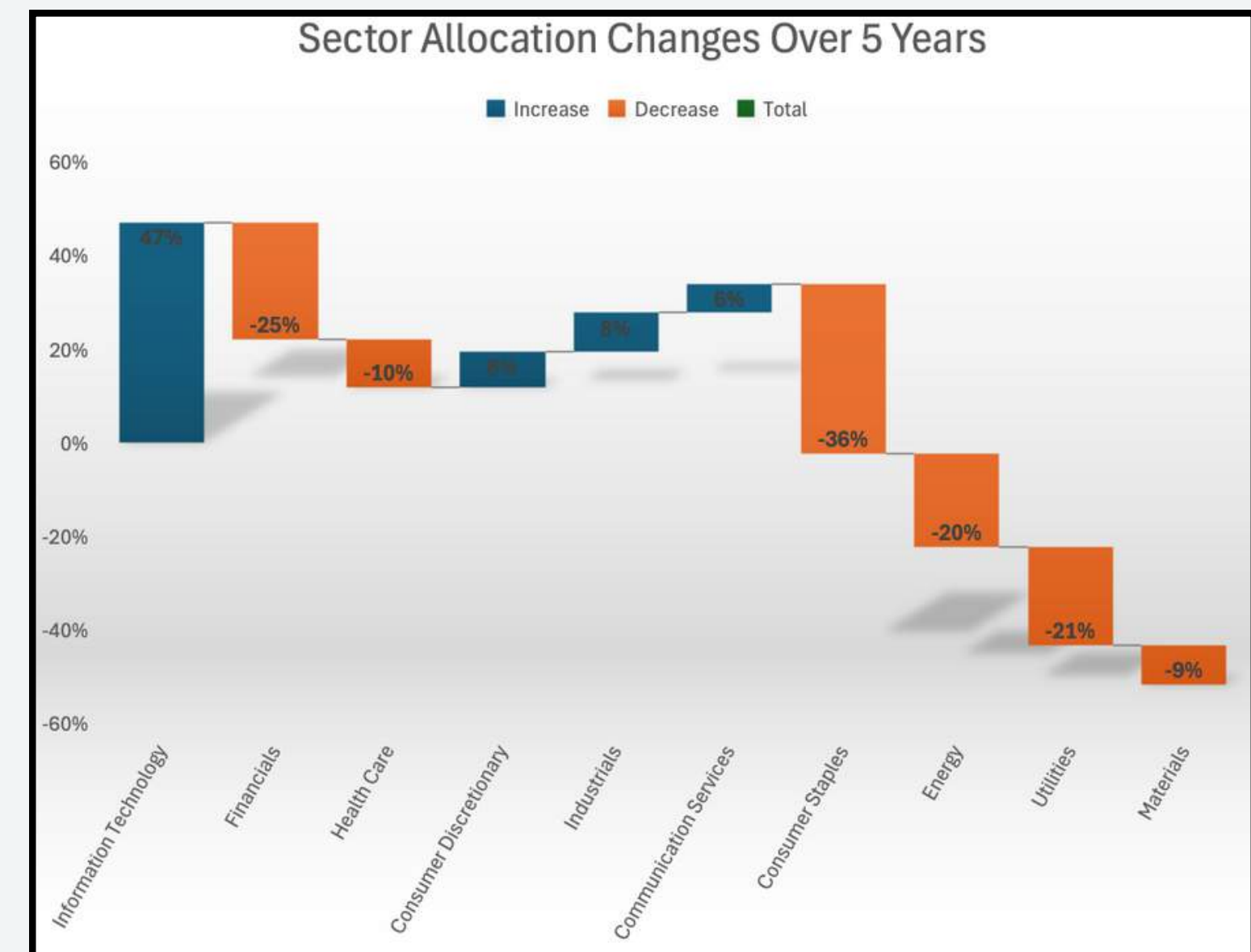
# Sample Output

BALANCED SUMMARY				 LSEG			
Portfolio Summary				Cumulative Total Return 16/09/2021 - 16/09/2024			
Portfolio Name	elp						
Currency	USD						
Benchmark Name	Invesco S&P 500 GARP ETF (ETF)						
Portfolio Value	7,513,468.42						
As Of	16/09/2024						
Concentration				Allocation by GICS Economic Sector			
	Portfolio	Benchmark	Difference	 <div>29.53% - Information Technology 13.59% - Financials 13.03% - Health Care 9.82% - Consumer Discretionary 9.20% - Industrials 8.58% - Communication Services 5.46% - Consumer Staples 3.54% - Energy 2.76% - Utilities 2.26% - Materials 1.25% - N/A 0.98% - Real Estate</div>			
Equity	100.00%	99.92%	0.08%				
Fixed Income	0.00%	0.00%	0.00%				
Cash	0.00%	0.08%	-0.08%				
Other	0.00%	0.00%	0.00%				
Benchmark Holdings	11.47%						
% of Top 15 Holdings	49.54%	29.02%	20.52%				
% of Top 25 Holdings	70.18%	44.49%	25.69%				
Key Statistics (1 Year)							
	Portfolio	Benchmark	Difference		Portfolio	Benchmark	Difference
Arithmetic Mean Return	18.95	11.91	7.03	Maximum Drawdown	6.70%	14.27%	-7.57%
Batting Average	0.57	0.43	0.13	Profitable Periods	67.92%	56.60%	11.32%
Realized Alpha	8.98%	0.00%	8.98%	Losing Periods	32.08%	43.40%	-11.32%
Realized Beta	0.72	1.00	-0.28	Upside Capture Ratio	0.67	1.00	-0.33
Standard Deviation	12.07	14.66	-2.59	Downside Capture Ratio	0.47	1.00	-0.53
Realized Tracking Error	7.05%	0.00%	7.05%	Upside Semi-Standard Deviation	1.68%	1.87%	-0.19%
Sharpe Ratio	1.09	0.35	0.74	Downside Semi-Standard Deviation	1.70%	2.26%	-0.55%
Information Ratio	1.21			Upside Semi-Variance	2.82	3.49	-0.67
Total Period Return	20.39	11.69	8.70	Downside Semi-Variance	2.90	5.10	-2.20





### Allocation by GICS Economic Sector



### Active Weight by GICS Economic Sector

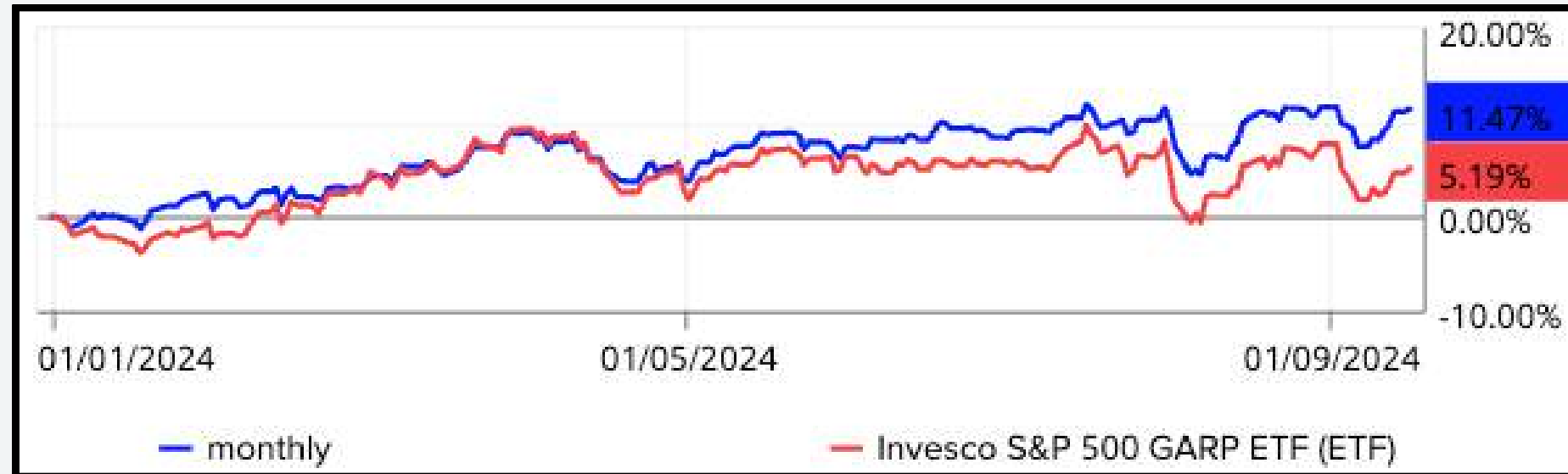
Issue Name	Portfolio Weight	Benchmark Weight	Weight Difference
monthly	100.00%	100.00%	0.00%
Energy	3.54%	23.10%	-19.56%
Materials	2.26%	7.78%	-5.52%
Industrials	9.20%	13.91%	-4.72%
Consumer Discretionary	9.82%	15.11%	-5.28%
Consumer Staples	5.46%	2.91%	2.55%
Health Care	13.03%	3.20%	9.83%
Financials	13.59%	14.02%	-0.44%
Information Technology	29.53%	17.84%	11.69%
Communication Services	8.58%	2.04%	6.54%
Utilities	2.76%		2.76%
Real Estate	0.98%		0.98%
Cash & Equivalents		0.08%	-0.08%
N/A	1.25%		1.25%

### Top/Bottom 5 Securities by weight

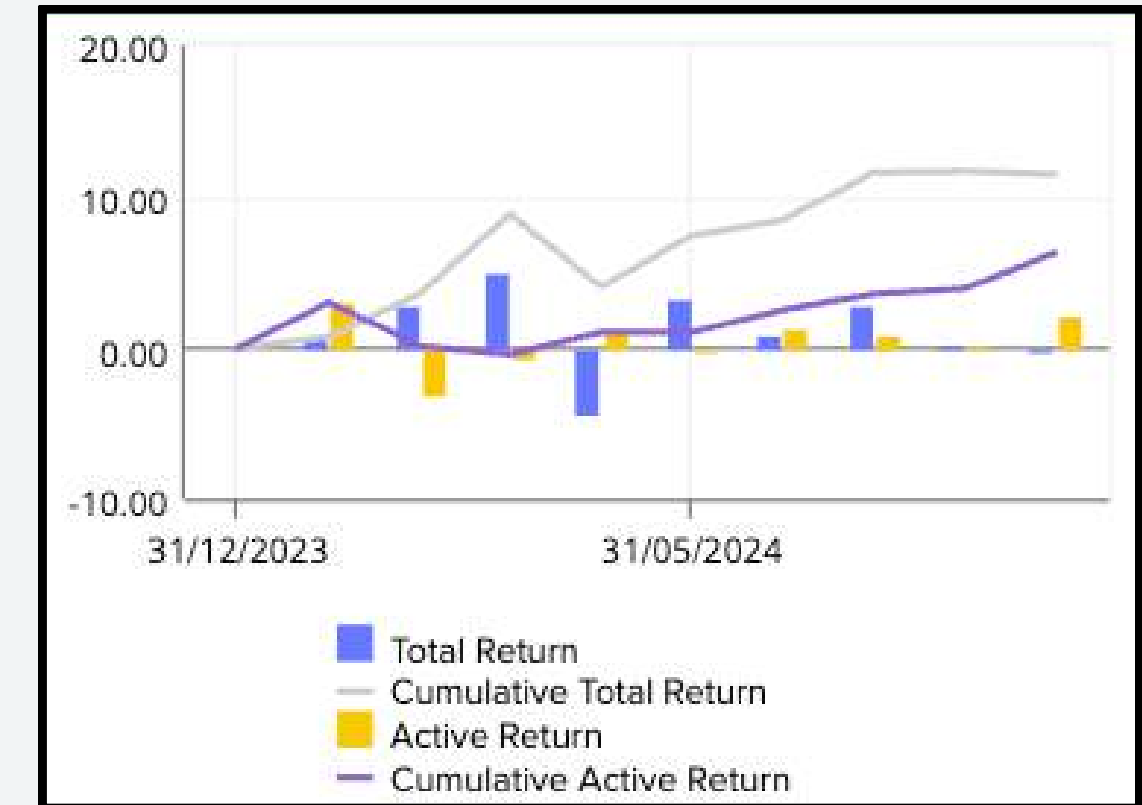
Microsoft Ord Shs	4.00%
HCA Healthcare Ord Shs	3.87%
Apple Ord	3.85%
International Business Machine...	3.77%
American Express Ord Shs	3.52%
<b>Top 5</b>	<b>19.01%</b>

Energy Select Sector SPDR Fund	0.50%
ProLogis REIT Ord Shs	0.98%
Albertsons Company Ord Shs C...	0.98%
Molina Healthcare Ord Shs	1.21%
Real Estate Select Sector SPDR ...	1.25%
<b>Bottom 5</b>	<b>4.93%</b>

	Portfolio	Benchmark	Difference
% of Top 15 Holdings	49.54%	29.02%	20.52%
% of Top 25 Holdings	70.18%	44.49%	25.69%



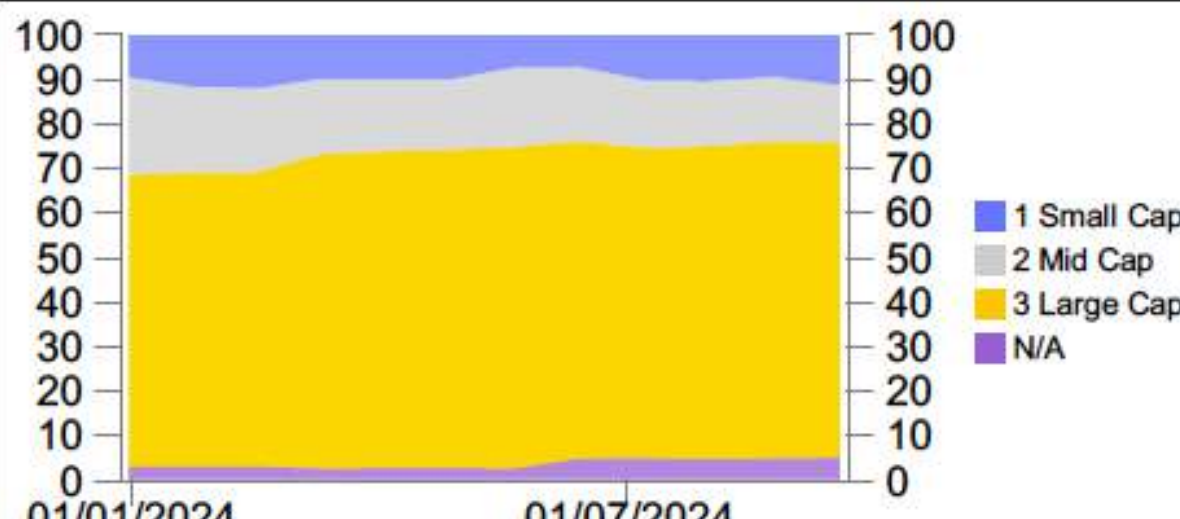
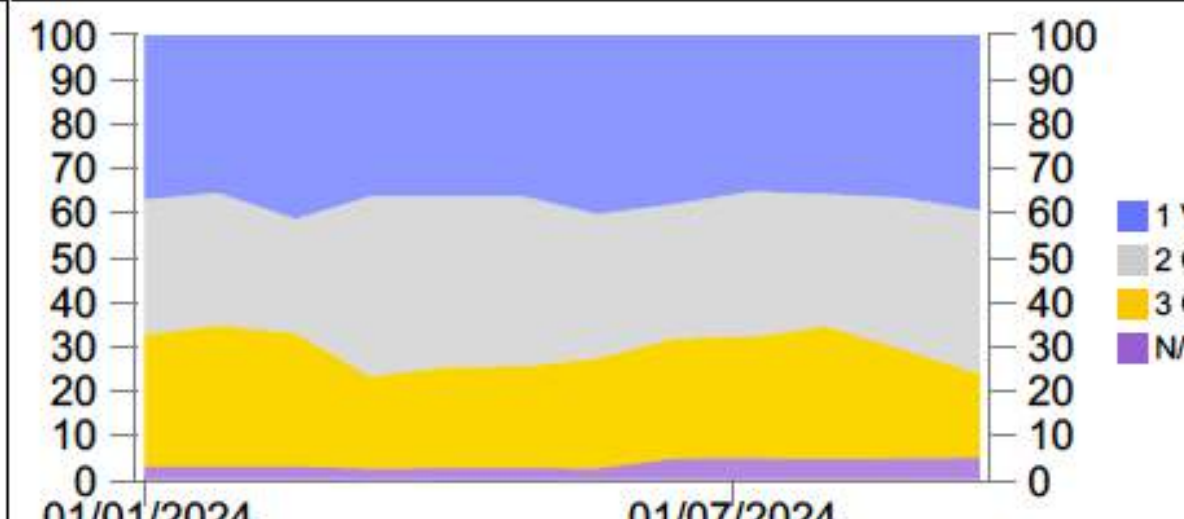
## Performance and Contribution



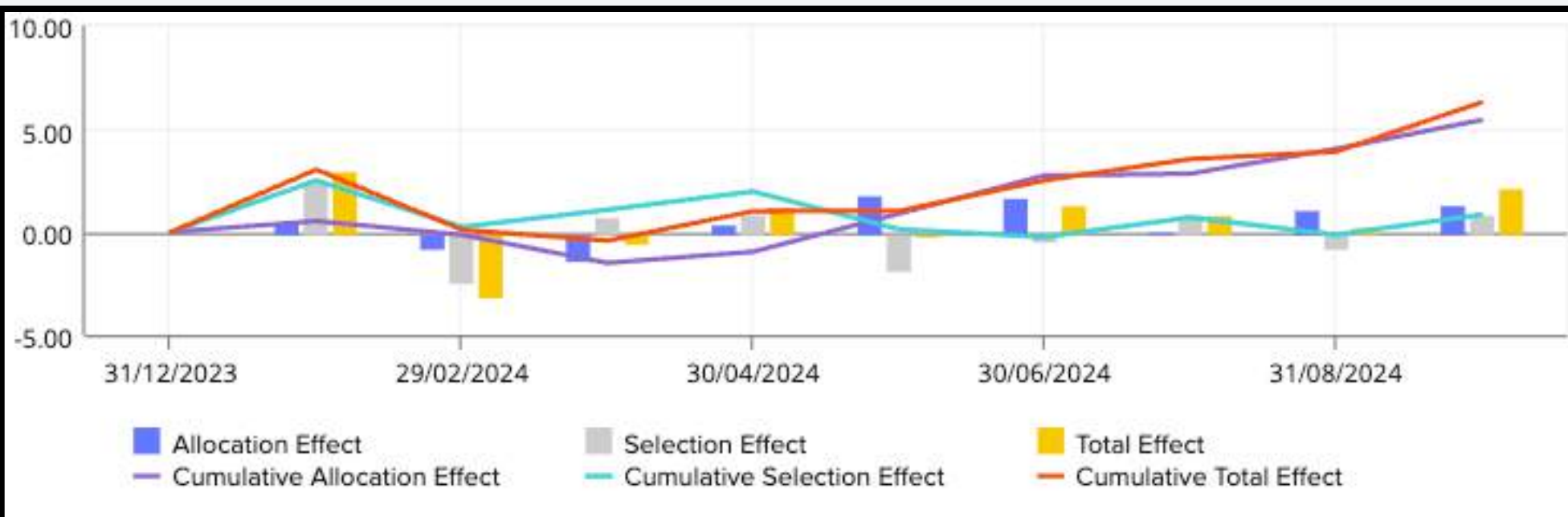
Issue Name	Weight Difference	Portfolio Return	Benchmark Return	Return Difference	Contribution to Portfolio Return	Contribution to Benchmark Return	Contribution Difference
monthly	0.00%	11.47	5.19	6.29	11.47	5.19	6.29
Financials	-0.44%	34.08	18.10	15.98	3.97	1.57	2.39
Materials	-5.52%	3.42	-14.53	17.95	0.06	-1.71	1.77
Health Care	9.83%	12.35	15.14	-2.78	1.56	0.59	0.97
Utilities	2.76%	39.80		39.80	0.86	0.86	
Information Technology	11.69%	10.74	9.40	1.34	3.24	2.60	0.64
Consumer Staples	2.55%	1.46	-11.88	13.34	0.09	-0.41	0.50
Communication Services	6.54%	9.21	24.53	-15.33	0.73	0.31	0.43
N/A	1.25%	15.15	2.20	12.95	0.21	0.00	0.21
Cash & Equivalents	-0.08%		1.96	-1.96		0.00	0.00
Real Estate	0.98%	-0.72	-3.68	2.96	-0.10	-0.04	-0.06
Industrials	-4.72%	4.61	1.98	2.62	0.47	0.55	-0.09
Energy	-19.56%	3.99	1.49	2.49	0.21	0.41	-0.20
Consumer Discretionary	-5.28%	1.54	9.23	-7.68	0.18	1.32	-1.14





Summary Report													
Portfolio Name		Currency		Time Period			Total Return						
monthly		USD		31/12/2023 - 16/09/2024			11.474						
Classification Over Time Refinitiv Size (2.0) (31/12/2023 - 16/09/2024)						Classification Over Time Refinitiv Style (2.0) (31/12/2023 - 16/09/2024)							
													
Contribution by Size						Contribution by Style							
Issue Name		Average Portfolio Weight	Portfolio Return	Contribution to Portfolio Return		Issue Name		Average Portfolio Weight	Portfolio Return	Contribution to Portfolio Return			
1 Small Cap		9.554%	-4.486	-0.374		1 Value		37.348%	10.994	4.111			
2 Mid Cap		16.868%	1.225	-0.098		2 Core		33.284%	11.973	3.624			
3 Large Cap		70.248%	16.898	11.524		3 Growth		26.039%	12.625	3.318			
Cash & Equivalents						Cash & Equivalents							
Contribution to Portfolio Return - Top 5 Securities						Contribution to Portfolio Return - Bottom 5 Securities							
Issue Name		Average Portfolio Weight	Size Score (2.0)	Style Score (2.0)	Portfolio Return	Contribution to Portfolio Return	Issue Name		Average Portfolio Weight	Size Score (2.0)	Style Score (2.0)	Portfolio Return	Contribution to Portfolio Return
HCA Healthcare Ord Shs		3.068%	58.00	29.00	49.883	1.331	AMN Healthcare Ord Shs		1.202%	-47.00	-87.00	-38.475	-0.646
Progressive Ord Shs		2.471%	70.00	77.00	61.877	1.282	Concentrix Ord Shs		0.460%			-25.974	-0.589
International Business Ma..		3.633%	80.00	-57.00	36.501	1.174	Topgolf Callaway Brands Ord S..		1.561%	-47.00	-97.00	-27.476	-0.520
American Express Ord Shs		3.223%	77.00	15.00	40.676	1.144	Warner Bros. Discovery Ord Sh..		1.369%	-8.00	-85.00	-24.780	-0.449
Intercontinental Exchange..		2.890%	54.00	-14.00	27.261	0.763	Nike Ord Shs Class B		1.358%	64.00	-60.00	-25.606	-0.406





## Return Attribution

Accumulative

Attribution Details

Issue Name	Average Portfolio Weight	Average Benchmark Weight	Average Weight Difference	Portfolio Return	Benchmark Return	Return Difference	Allocation Effect	Selection Effect	Total Effect
monthly	100.00%	100.00%	0.00%	11.47	5.19	6.29	7.95	-1.66	6.29
▶ Basic Materials	1.47%	10.17%	-8.69%	7.04	-16.39	23.43	2.01	0.62	2.63
▶ Health Care	10.95%	6.91%	4.05%	20.11	15.14	4.97	0.99	0.58	1.57
▶ Financials	12.98%	5.56%	7.42%	26.84	22.26	4.58	1.12	0.44	1.56
▶ Energy	3.20%	26.48%	-23.28%	2.64	-1.09	3.72	1.39	0.10	1.49
▶ Utilities	4.98%		4.98%	32.12		32.12	1.26	0.00	1.26
▶ Consumer Staples	5.91%	2.81%	3.10%	1.46	-11.88	13.34	-0.53	0.84	0.31
▶ Industrials	11.23%	10.98%	0.26%	7.21	4.28	2.93	-0.13	0.26	0.14
▶ N/A		0.03%	-0.03%		2.20	-2.20	0.00	0.00	0.00
▶ Cash & Equivalents		0.03%	-0.03%		1.96	-1.96	0.00	0.00	0.00
▶ Real Estate	1.17%	0.71%	0.47%	-0.72	-3.68	2.96	0.06	-0.14	-0.08
▶ Telecommunications	3.80%	1.65%	2.15%	17.33	52.50	-35.18	1.17	-1.48	-0.31
▶ Technology	31.18%	20.73%	10.45%	8.96	13.32	-4.35	0.98	-1.58	-0.60
▶ Consumer Discretionary	13.11%	13.95%	-0.84%	-1.08	7.87	-8.96	-0.37	-1.30	-1.67



## Portfolio Risk by Factor Groups

	Portfolio	Active
Specific Risk Contrib	0.80	2.94
World	11.54	0.00
Industry Group	0.11	1.86
Style	0.03	0.98
Currency	0.00	0.01
Region	1.05	0.01
Statistical	0.06	0.02
Total Risk	13.58	5.82

## Top 5 Active Risk Contributors

Issue Name	Active Risk Weight	Active Sensitivity	Active Risk Contribution
EOG Resources Ord Shs	-2.25%	-10.06	0.23
Valero Energy Ord Shs	-2.03%	-10.09	0.20
Marathon Oil Ord Shs	-1.82%	-10.52	0.19
ConocoPhillips Ord Shs	-1.96%	-9.27	0.18
Marathon Petroleum Ord Shs	-2.01%	-8.59	0.17

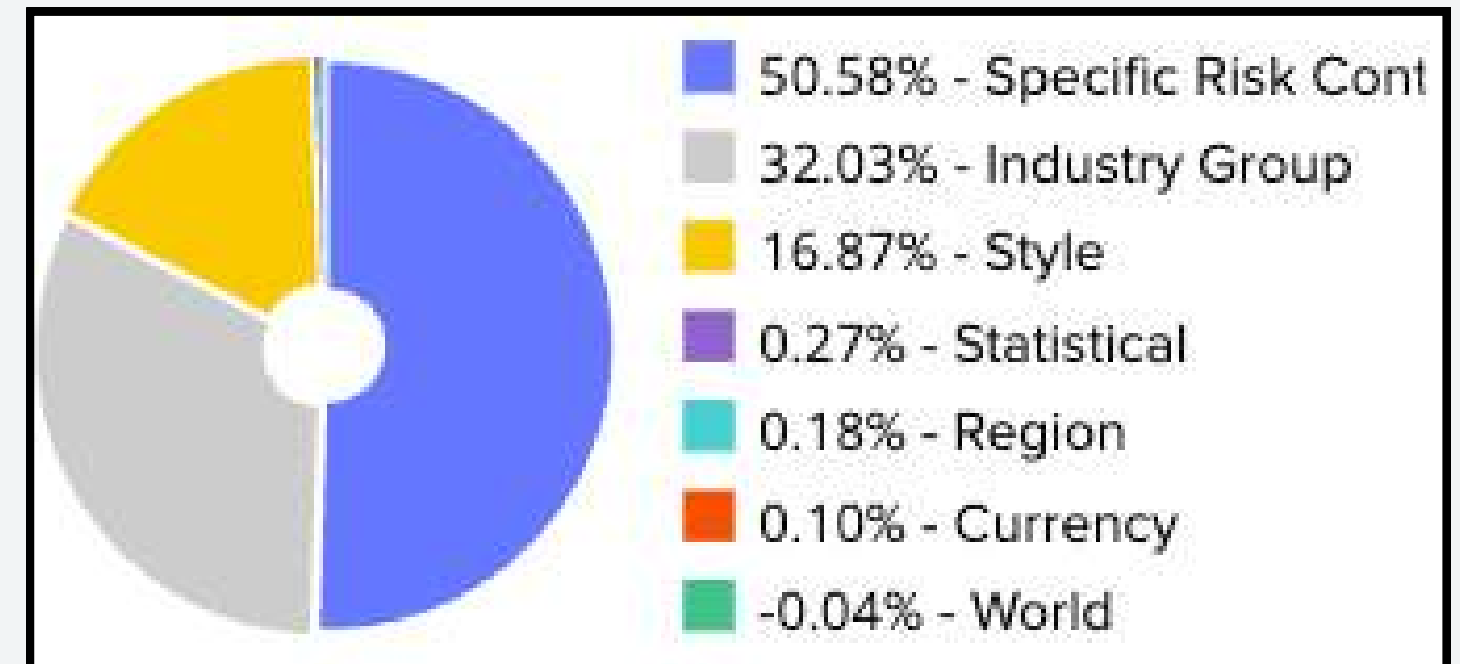
## Bottom 5 Active Risk Contributors

Issue Name	Active Risk Weight	Active Sensitivity	Active Risk Contribution
Micron Technology Ord Shs	2.00%	-4.27	-0.09
Topgolf Callaway Brands Ord S...	1.89%	-4.84	-0.09
M&T Bank Ord Shs	1.61%	-5.69	-0.09
Cheniere Energy Ord Shs	1.87%	-5.43	-0.10
Citigroup Ord Shs	2.92%	-6.91	-0.20

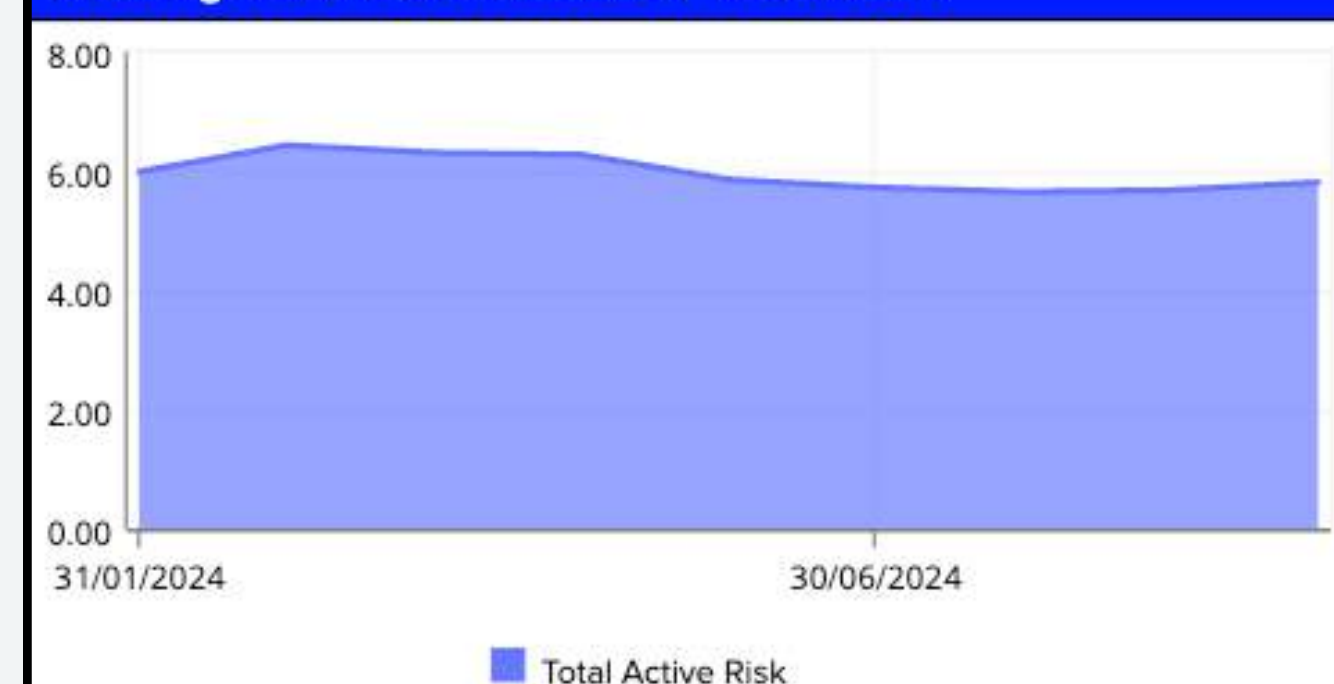
# Risk Analytics

## Forecast Risk Summary

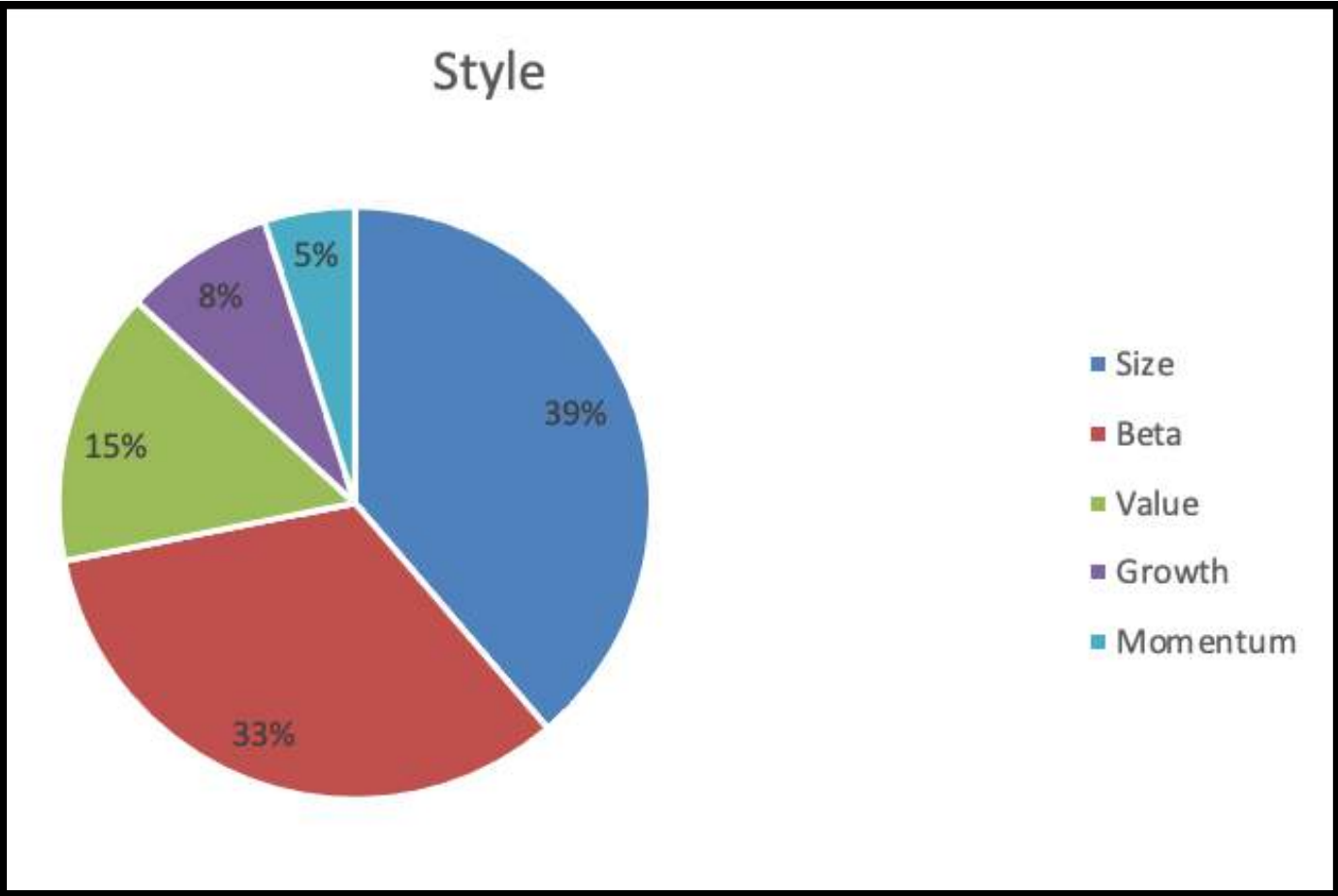
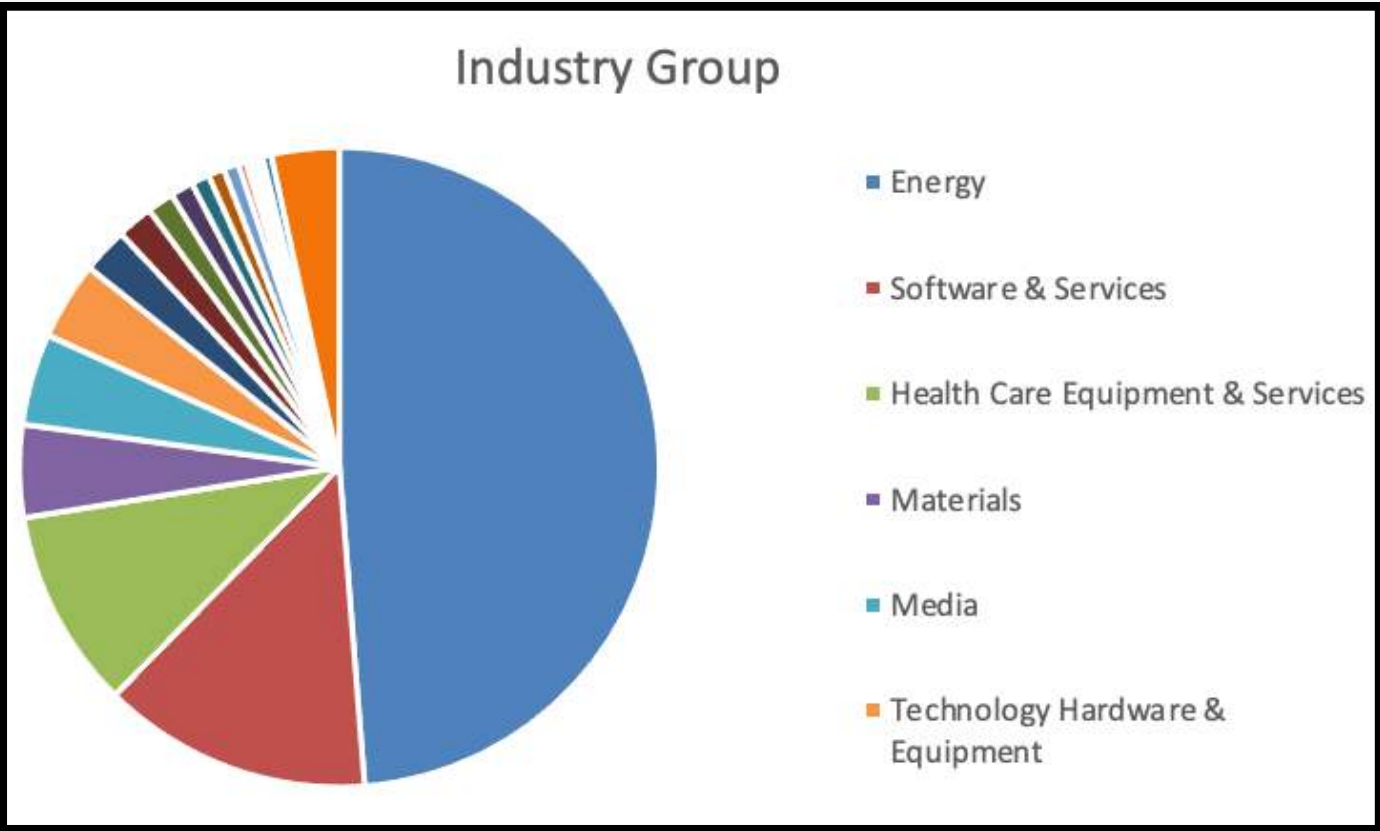
	Fund	Benchmark	Active
Total Risk	13.58	14.96	5.82
Beta	0.84	1	
Correlation	0.92	1	



## Tracking Error % 31/12/2023 - 16/09/2024



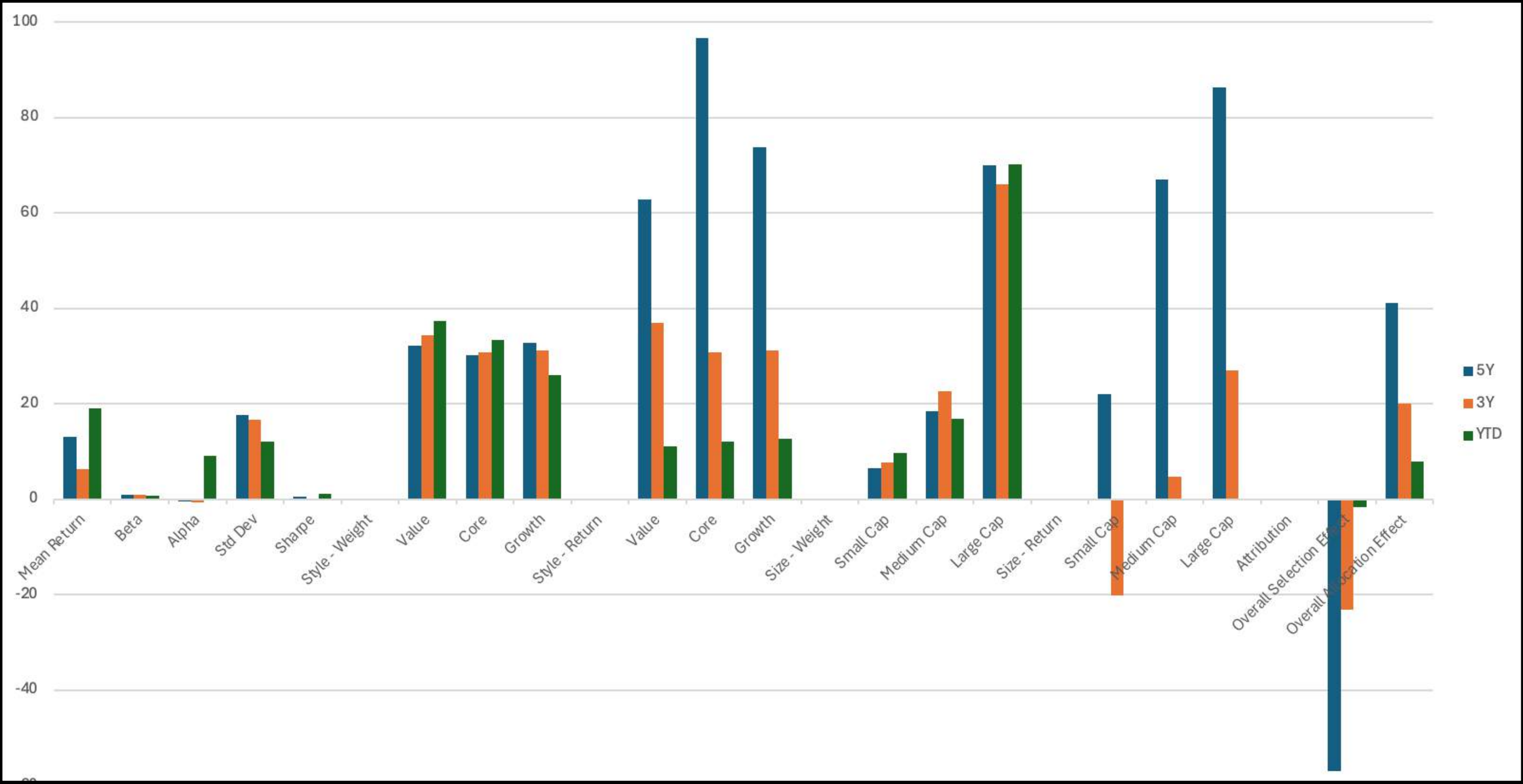
Active Risk Contribution	
Industry Group	2.88
Style	1.86



	Active Risk Contribution
Totals and Averages	2.88
Industry Group	1.86
Energy	0.99
Software & Services	0.28
Health Care Equipment & Services	0.20
Materials	0.09
Media	0.09
Technology Hardware & Equipment	0.08
Utilities	0.05
Food Beverage and Tobacco	0.04
Telecommunication Services	0.03
Real Estate	0.02
Consumer Services	0.02
Retailing	0.02
Semiconductors & Semiconductor Equipment	0.02
Consumer Durables and Apparel	0.01
Commercial Services & Supplies	0.01
Pharmaceuticals & Biotechnology	0.00
Diversified Financials	0.00
Automobiles and Components	0.00
Household and Personal Products	0.00
Insurance	0.00
Capital Goods	0.00
Food & Staples Retailing	0.00
Transportation	-0.01
Banks	-0.07
Style	0.98
Size	0.38
Beta	0.33
Value	0.15
Growth	0.08
Momentum	0.05



# Key Statistics





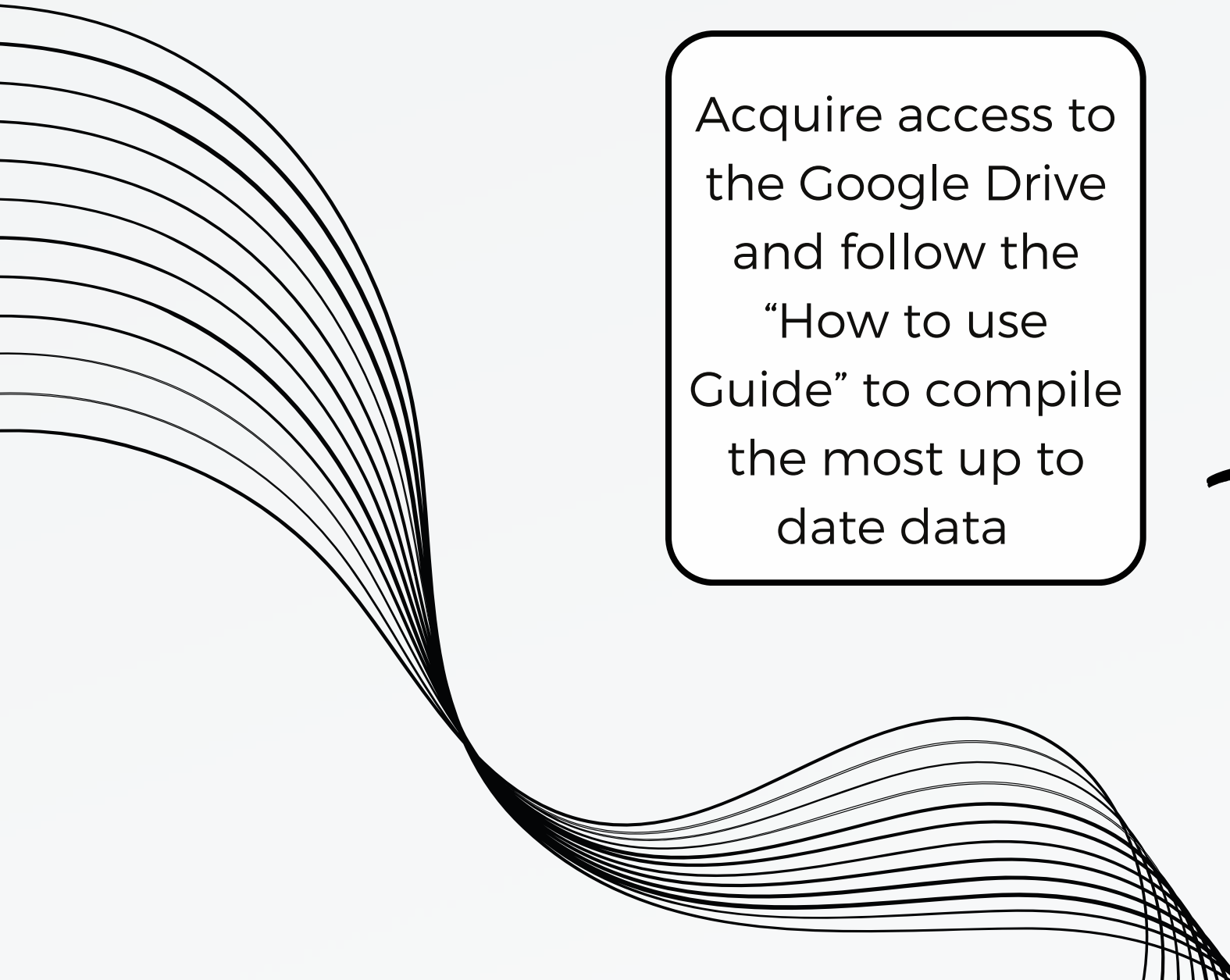
# RECOMMENDATIONS

Prioritize the stock selection of non-LLM stocks due increased dispersion and lowering correlation. Although LLM stocks did outperform in 2023 there seems to a noticeable slowdown in growth where the Mayor Fund can take advantage


Use these metrics to identify shifts in correlation, dispersion, or concentration, signaling changes in market dynamics. This allows for better forecasting of risks and opportunities, leading to more proactive fund management.



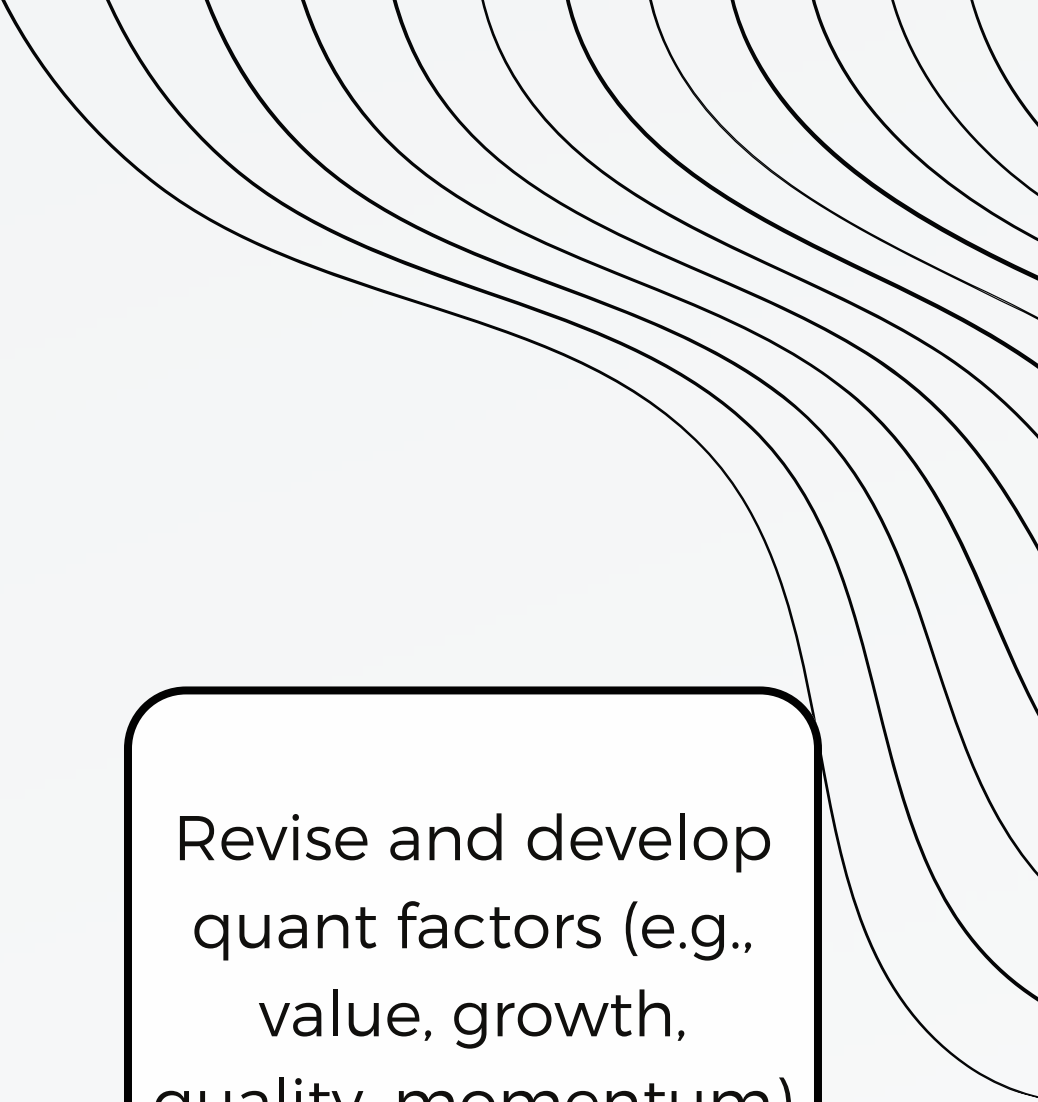

# FUTURE STEPS



Acquire access to the Google Drive and follow the “How to use Guide” to compile the most up to date data

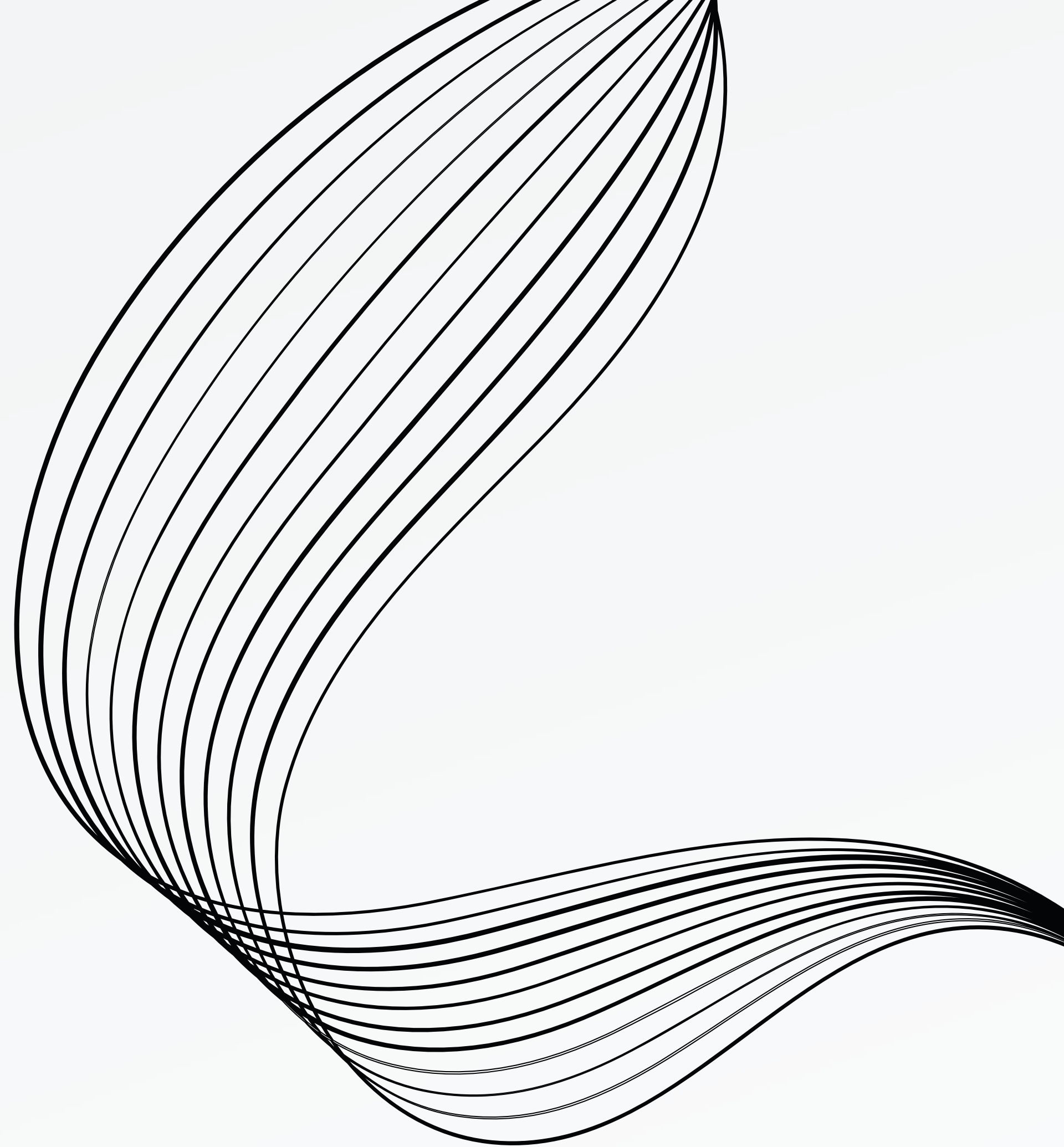


Understand the S&P 500 movements and create the latest LSEG risk attribution model



Revise and develop quant factors (e.g., value, growth, quality, momentum) while incorporating sector-specific fundamentals to enhance the performance of the fund

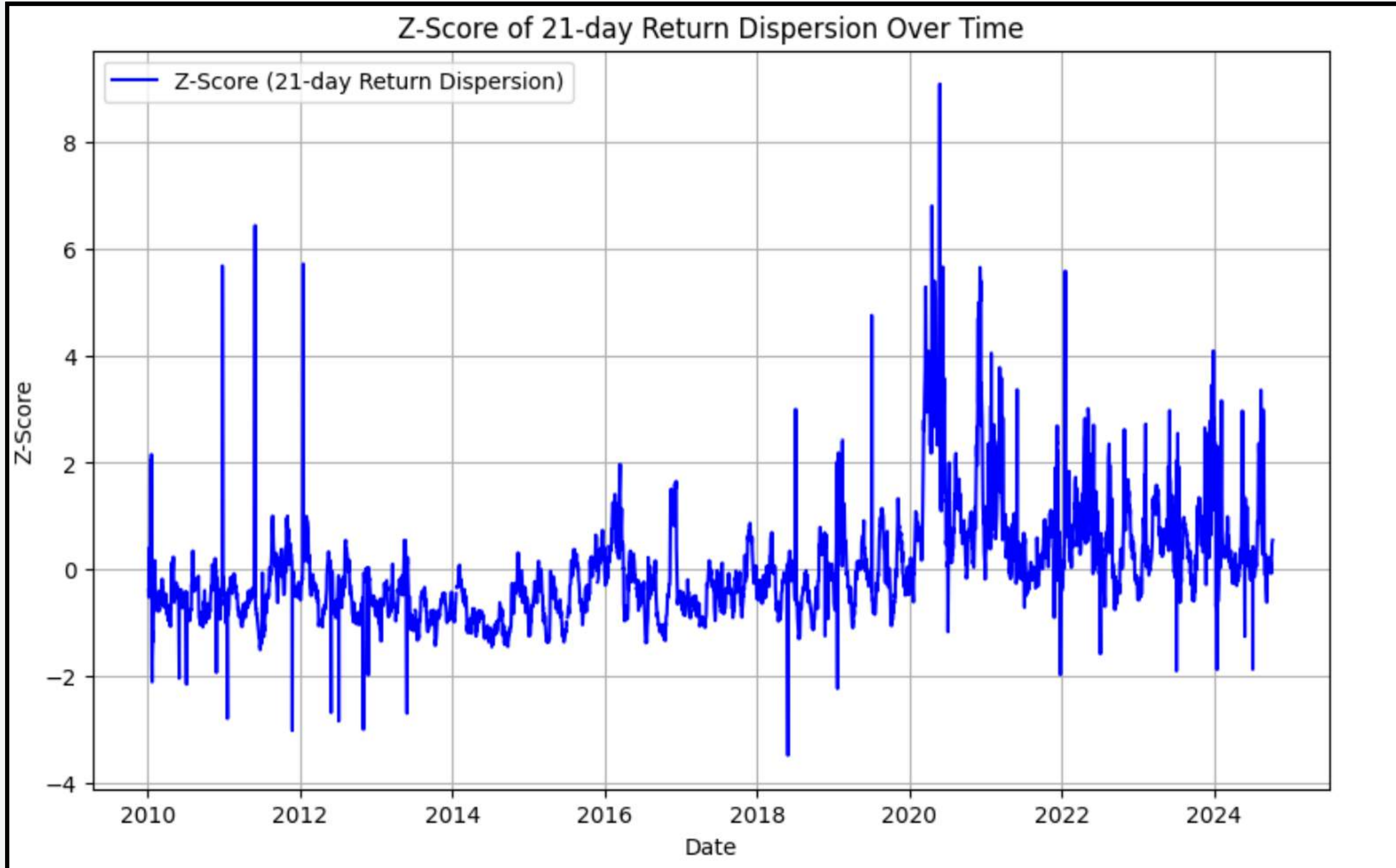
**THANK'S FOR  
WATCHING**

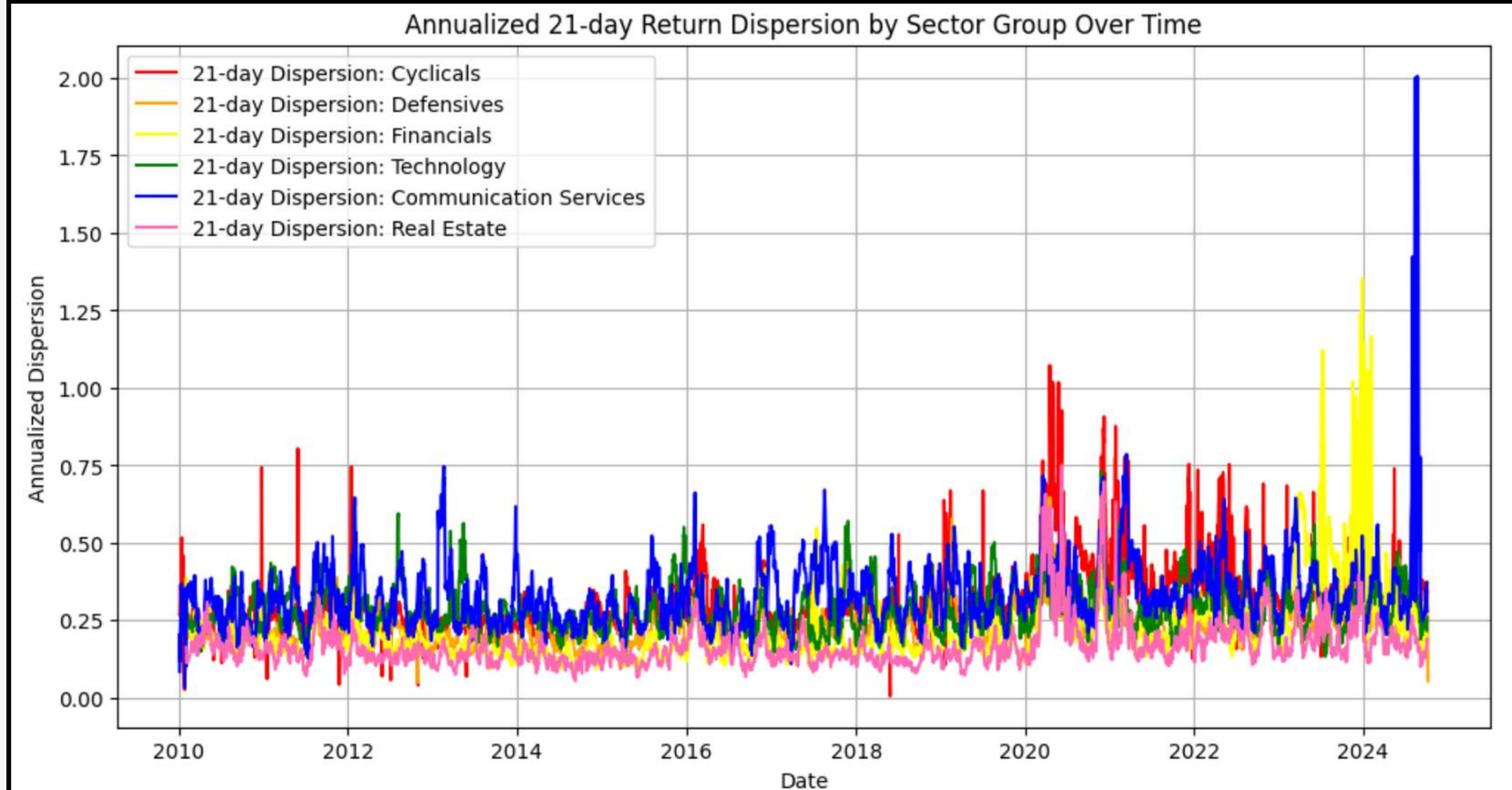




# APPENDIX

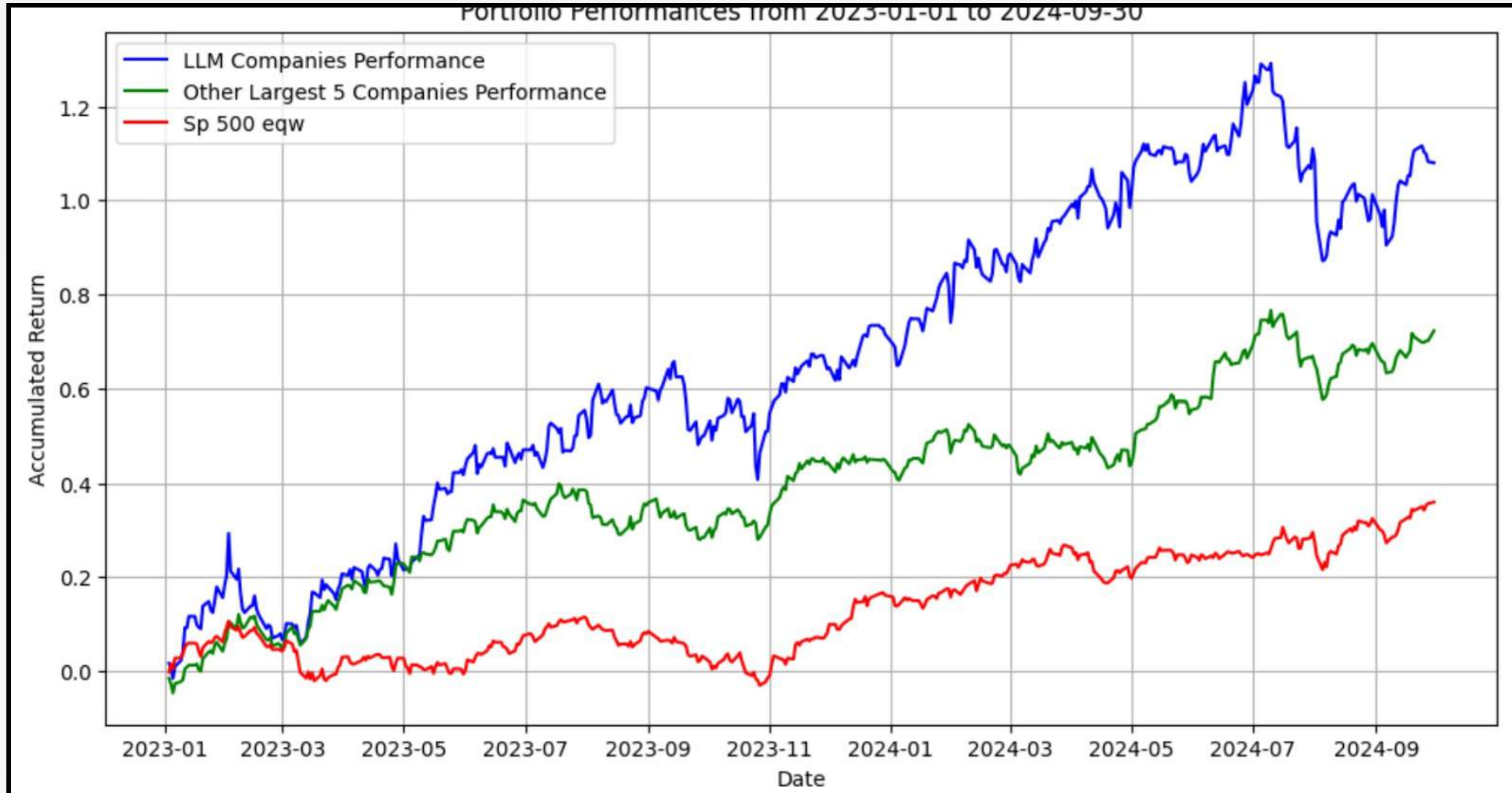


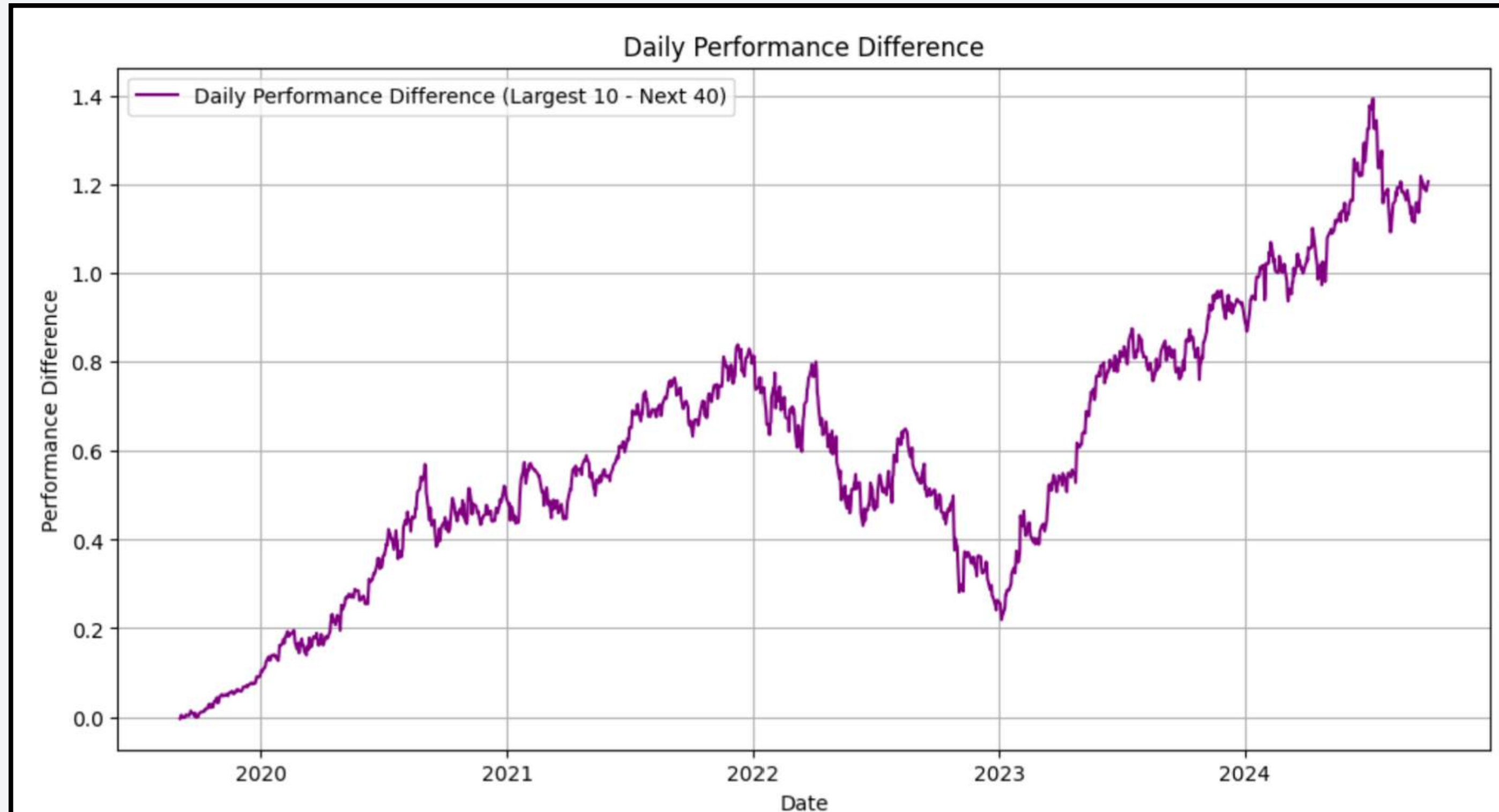




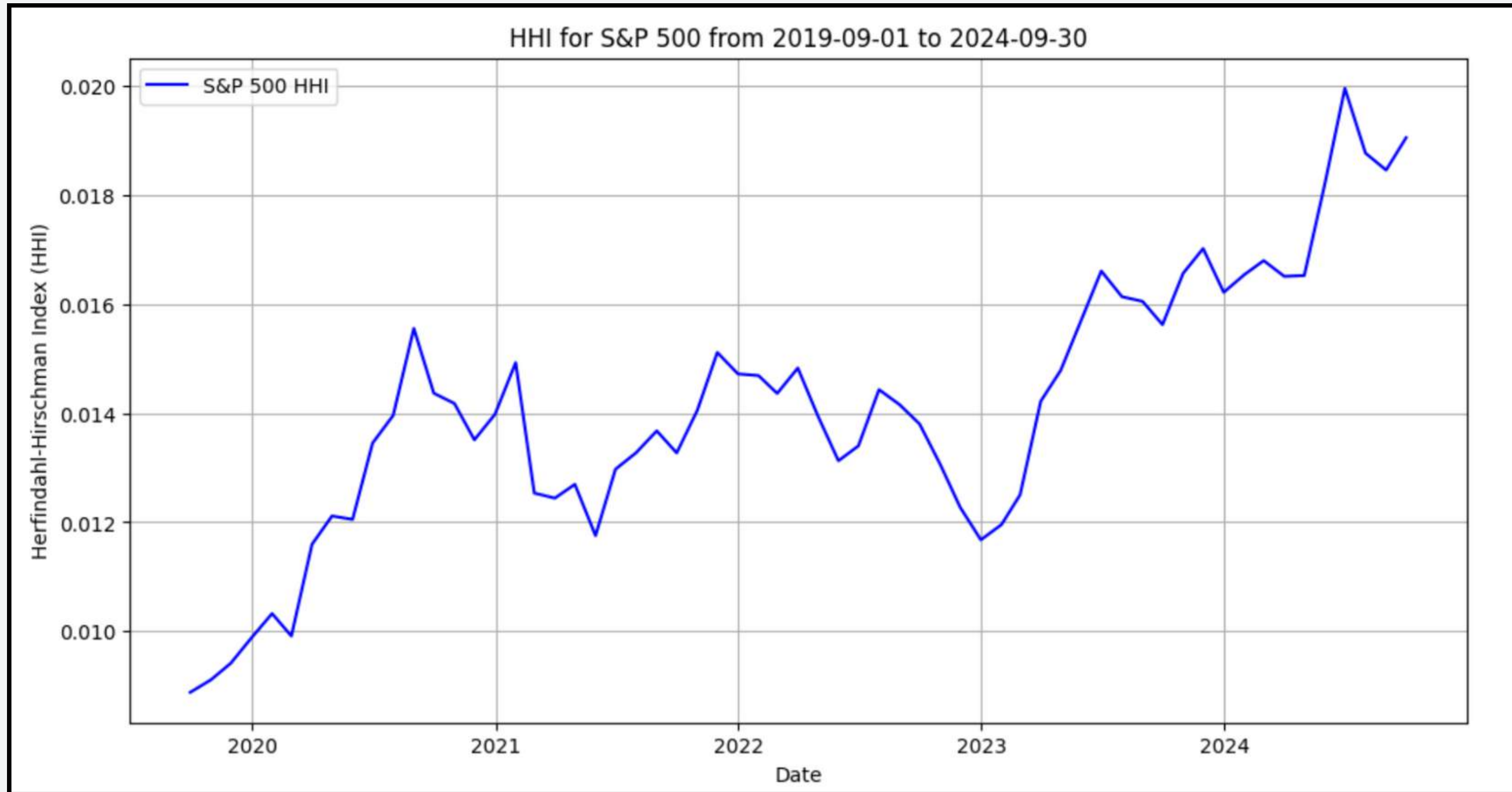
index	Group Name	GICS Sector Codes	Industry Names
0	Cyclicals	10, 15, 20, 25	Energy, Materials, Industrials, Consumer Discretionary
1	Defensives	30, 35, 55	Consumer Staples, Health Care, Utilities









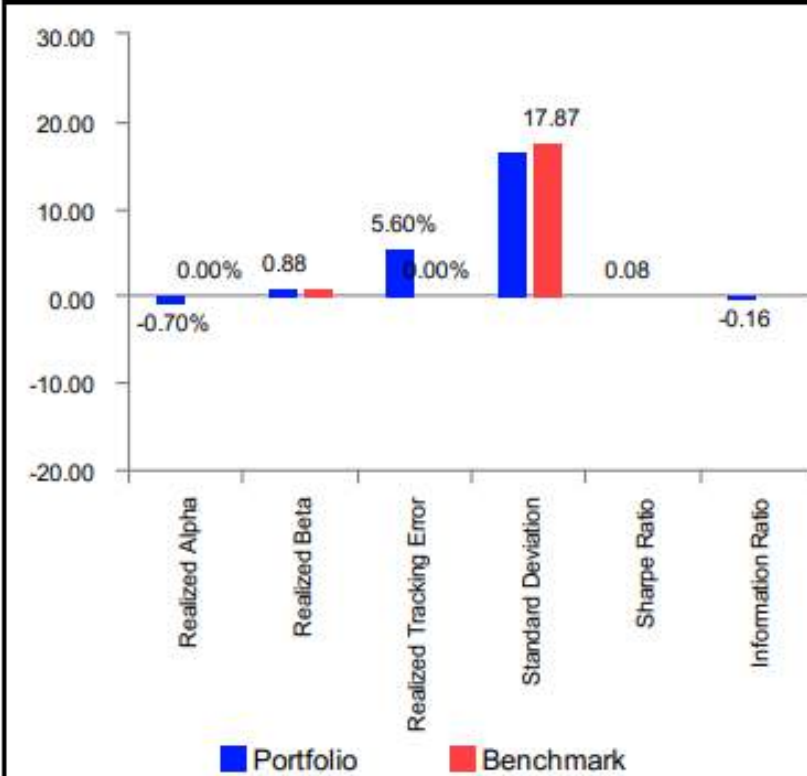




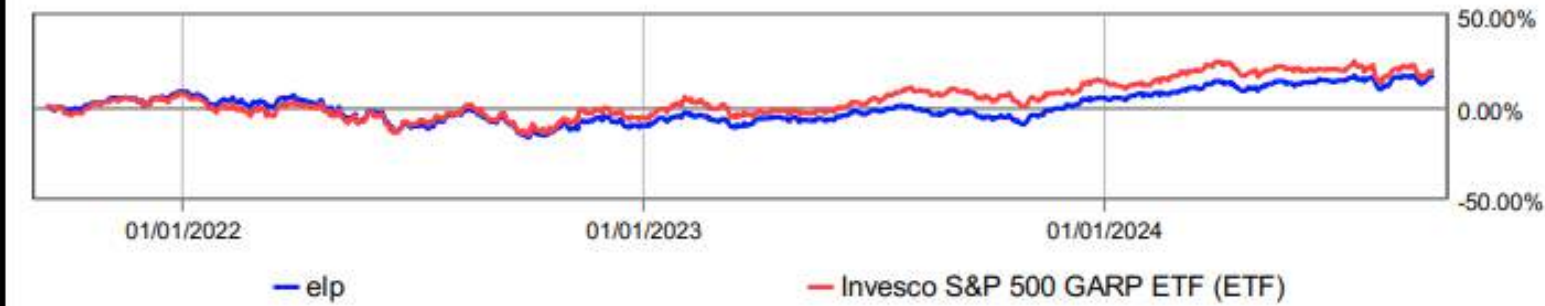
Valuation				Weight Difference, Dividend Yield, Weight Difference (16/09/2021 - 16/09/2021)	
	Portfolio	Benchmark	Difference		
Dividend Yield	1.48	1.58	-0.10		
P/E Trailing 12-Month	23.92	0.81	23.11		
P/E Forward 12-Month	17.87	13.13	4.74		
PEG Ratio Annual	2.28	1.45	0.83		
PEG Ratio Forecast 12-Month	1.62	1.26	0.36		
Price To Book	2.76	0.09	2.66		
Price To Cash Flow Per Share	12.68	0.99	11.69		
Growth				Value and Growth Characteristics	
Dividend Per Share - Actual	2.17	2.03	0.13		
Dividend Growth Hist 5 YR	6.18%	13.67%	-7.48%		
EPS IBES Actual (Curr Fisc YR / Last Fisc YR)	5.92%	-1.02%	6.94%		
EPS IBES Actual 3 YR Hist Growth	8.99	7.60	1.39		
EPS IBES Actual 5 YR Hist Growth	11.60	36.94	-25.35		
Revenue (Curr Fisc YR Est vs. Last Fisc. YR)	5.07%	5.24%	-0.16%		
Revenue 3 YR Hist Growth	3.54	5.21	-1.67		
Profitability				Weight Difference, Market Cap, Weight Difference (16/09/2021 - 16/09/2021)	
Net Profit Margin	17.25%	18.59%	-1.34%		
Operating Profit Margin	22.83%	22.71%	0.12%		
ROE Common Equity	45.93%	41.23%	4.70%		
Liquidity					
Market Cap	424.677 B	186.393 B	238.284 B		
Avg Daily Value Traded - 30D	570,812,357.63	361,204,830.09	209,607,527....		
Avg Daily Value Traded - 52W	525,480,326.24	346,525,935.67	178,954,390....		
Starmine Factors					
Value-Momentum Global Rank	38.912	43.760	-4.848		
Credit Combined Global Rank	54.962	51.895	3.067		
Price / Intrinsic Value Global Rank	32.473	40.506	-8.033		
Relative Valuation Global Rank	36.912	47.846	-10.934		
Analyst Revisions Model Global Rank	48.920	42.652	6.268		
Price Momentum Global Rank	59.721	57.997	1.724		



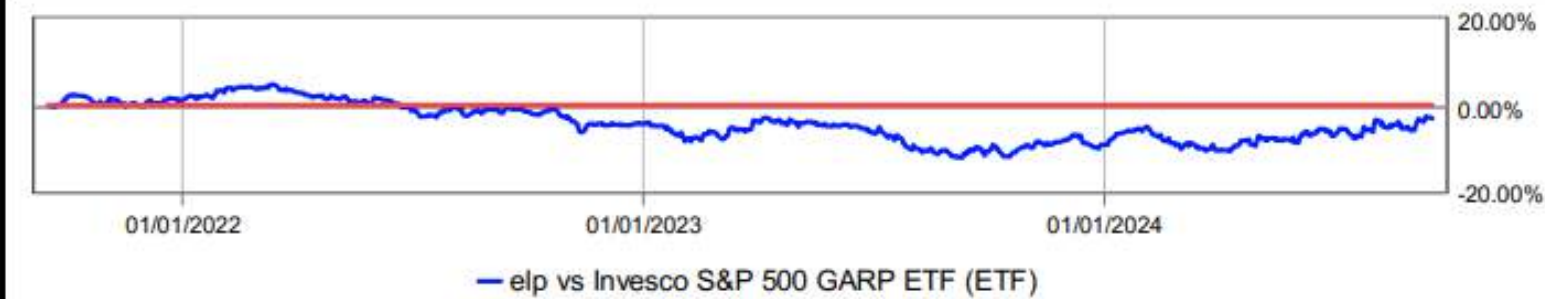
## ANNUALISED RISK & RETURN STATISTICS



### Cumulative Performance (16/09/2021 - 16/09/2024)



Cumulative Performance with Benchmark as base (16/09/2021 - 16/09/2024)



Risk Adjusted Returns			Realised Risk			Scorecard			
	Portfolio	Benchmark		Portfolio	Benchmark		Portfolio	Benchmark	
Treynor Ratio	0.01%	0.02%	Realized Alpha	-0.70%	0.00%	Losing Periods	43.24%	54.05%	
Sharpe Ratio	0.08	0.13	Realized Beta	0.88	1.00	Profitable Periods	56.76%	45.95%	
Information Ratio	-0.16		Realized Tracking Error	5.60%	0.00%	Total Period Return	16.42	19.55	
Sortino Ratio	0.16	0.22	Correlation Coefficient	0.95	1.00	Batting Average	0.46	0.54	
Sterling Ratio			Standard Deviation	16.59	17.87	Arithmetic Mean Return	6.28	7.34	
Calmar Ratio	0.17	0.42	R-Squared	0.90	1.00	Geometric Mean Return	5.05	5.96	
Upside Risk				Downside Risk			Additional Statistics		
	Upside Capture	Upside Semi-Standard Dev	Upside Semi-Variance	Downside Capture Ratio	Downside Semi-Standard Dev	Downside Semi-Variance	Avg Ann. Max Drawdown	Maximum Drawdown	Residual Risk
Portfolio	0.79	4.70%	22.08	0.89	4.96%	24.56		30.23%	2.20%
Benchmark	1.00	5.64%	31.76	1.00	4.80%	23.07		14.27%	0.00%