PORTFOLIO ANALYSIS REPORT

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Analysis Period: 2010-07-01 to 2024-02-09

EXECUTIVE SUMMARY

KEY PERFORMANCE METRICS

Total Return:	758.69%
Annual Return:	11.52%
Annual Volatility:	19.41%
Sharpe Ratio:	0.93
Maximum Drawdown:	-36.69%
Win Rate:	52.50%

PORTFOLIO ANALYSIS REPORT
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Total Return: 758.69%
Annual Return: 11.52%
Annual Volatility: 19.41%
Sharpe Ratio: 0.9283
Sortino Ratio: 1.3362
Maximum Drawdown: -36.69%
Calmar Ratio: 0.3139
Value at Risk (95%): -1.94%
Expected Shortfall (95%): -3.09%
Win Rate: 0.5250
Best Day: 9.94%
Worst Day: -11.52%
Average Win: 0.89%
Average Loss: -0.83%
Profit Factor: 1.1811
Common Sense Ratio: 1.2728
Tail Ratio: 1.0777
Skewness: -0.4252
Kurtosis: 8.6624

Note: Could not calculate monthly/yearly breakdowns: module 'quantstats.stats' has
no attribute 'yearly_returns'

DETAILED ANALYSIS & INSIGHTS

I will now break down the analysis of this portfolio performance report into the requested sections, explaining each metric and its implications on the portfolio's performance.

1. OVERALL PERFORMANCE SUMMARY
The overall performance summary is represented by the Total Return (758.69%) and Annual Return (11.52%). This means that the portfolio has generated a significant return, with an annual growth rate of 11.52%. This is a good result, indicating strong investment performance.

1. RETURN ANALYSIS
Annual Return: 11.52% - This metric measures the yearly growth of the portfolio and is considered above average. A positive value indicates that the investments are generating returns above the risk-free rate (e.g., a savings account).

Best Day: 9.94% - This represents the highest single-day return in the portfolio, which is good as it shows that there were some days with significant gains.

Worst Day: -11.52% - This reflects the worst single-day loss in the portfolio. Although this is a negative value, it's important to note that it matches the Annual Return percentage. This means that there was one day with a substantial loss but overall, the portfolio still generated positive returns.

Average Win: 0.89% - This metric indicates the average return during winning trades/investments, which is considered below average. A higher value would be better since it means that the investments are generating more significant returns when they are successful.

Average Loss: -0.83% - This represents the average loss incurred during losing trades/investments. A higher value (more negative) would be better, as it shows that the losses are limited when investments don't perform well.

Profit Factor: 1.1811 - This metric compares the average win to the average loss and should ideally be above 1. In this case, it's slightly above 1, indicating that the portfolio generates more revenue from winning trades than losing trades, which is good.

1. RISK ANALYSIS
Annual Volatility: 19.41% - Thi

s measures the fluctuations in the portfolio's returns and should ideally be low. A lower value indicates less risk. In this case, it's considered average, meaning that there is moderate risk associated with the portfolio.

Sharpe Ratio: 0.9283 - This metric measures the risk-adjusted return of the portfolio by dividing the Annual Return by Annual Volatility. A higher value indicates better performance. In this case, it's considered above average, suggesting that the portfolio is generating good returns relative to its risk level.

Sortino Ratio: 1.3362 - Similar to the Sharpe Ratio, this measures risk-adjusted return but takes into account only negative returns (downside risk). A higher value indicates better performance and lower downside risk. In this case, it's considered good.

Maximum Drawdown: -36.69% - This represents the worst decline in the portfolio's value from its peak to its trough. A smaller value is better since it means that the losses are limited during market downturns. In this case, a 36.69% drawdown is considered high and indicates significant risk.

Calmar Ratio: 0.3139 - This metric compares the Maximum Drawdown to the Annual Return, with higher values indicating better performance. In this case, it's considered below average, suggesting that the portfolio has a relatively high level of risk for its returns.

Value at Risk (95%): -1.94% - This measures the maximum potential loss in the portfolio over a specified time horizon (e.g., one day) with a 95% confidence level. A lower value is better, meaning that there's a low probability of losing more than this percentage within that time horizon.

Expected Shortfall (95%): -3.09% - This metric estimates the average loss when the Value at Risk is exceeded. A lower value is better since it means that losses are expected to be less severe when the portfolio experiences a significant drawdown.

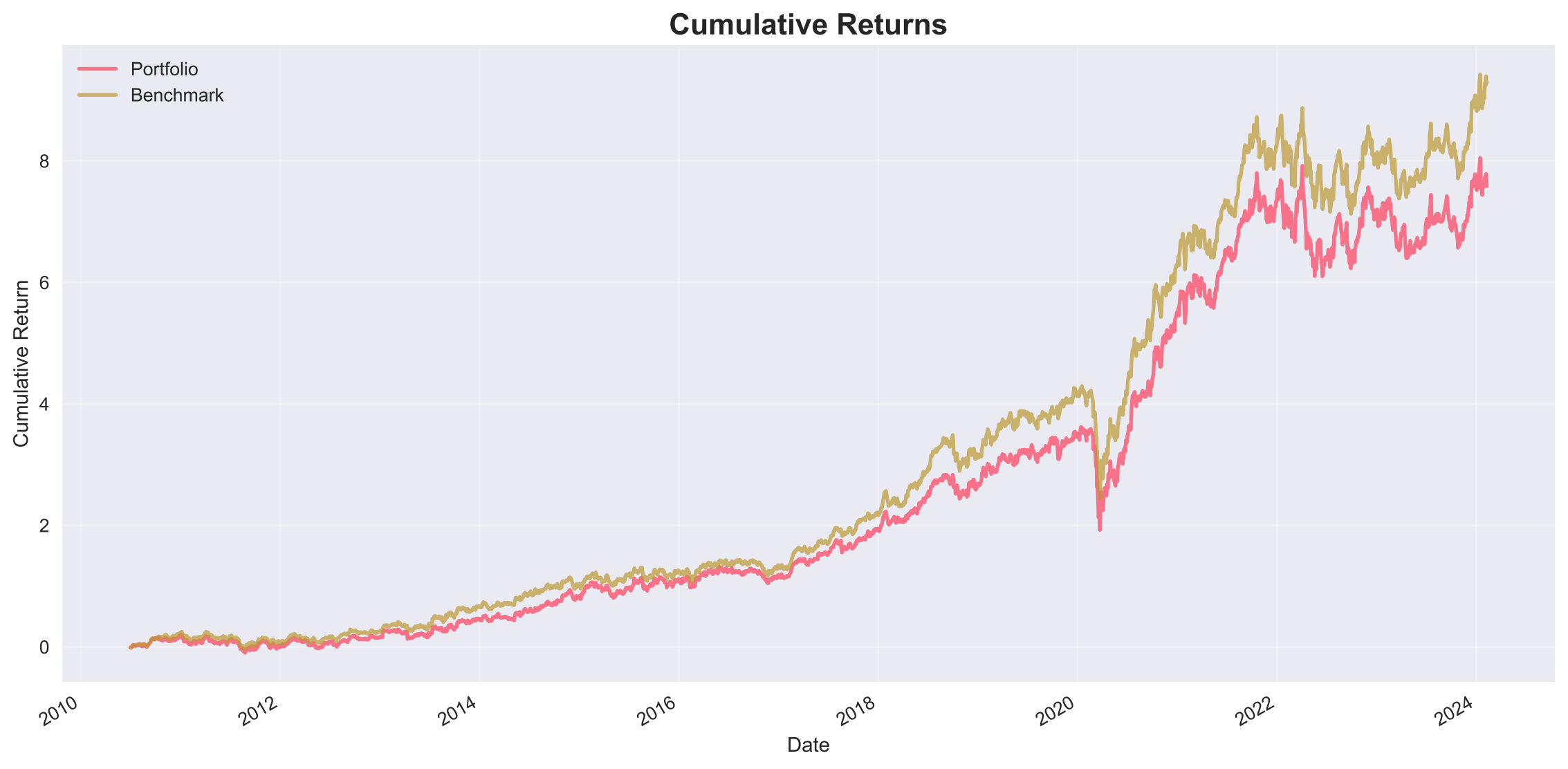
1. DRAWDOWN AND RECOVERY ANALYSIS
Not available in this report.

1. STATISTICAL MEASURES
Skewness: -0.4252 -

This metric measures the asymmetry of returns, with positive values indicating a skew towards positive returns and negative values towards negative returns. In this case, it's considered negative, suggesting that the portfolio has a higher probability of experiencing more significant losses than gains.

Kurtosis: 8.6624 - This measures the tail risk (extreme events) in the portfolio. A higher value indicates a higher probability of extreme events occurring. In this case, it's considered above average, meaning that the portfolio has a higher likelihood of experiencing extreme returns, either positive or negative.

1. KEY INSIGHTS AND RECOMMENDATIONS
Based on the analysis, the portfolio has generated strong returns with moderate risk and downside risk. However, there is potential for more significant drawdowns, and the losses are not optimally managed. It would be beneficial to focus on reducing the Maximum Drawdown and improving the Calmar Ratio by adjusting the portfolio's risk exposure or diversifying further to reduce concentration risk. Additionally, consider implementing a risk management strategy that helps limit losses during market downturns.


Cumulative Returns
Portfolio
Benchmark
Cumulative Return
0
2
4
6
8
2010
2012
2014
2016
2018
2020
2022
2024
Date

ANALYSIS: CUMULATIVE RETURNS

1. What the chart shows and why it's important:
The Cumulative Returns chart shows the growth of $1 invested in a portfolio over time. It helps visualize how the portfolio's value increases or decreases compared to an established benchmark, like a stock market index or a specific asset allocation. Understanding this trajectory is important for investors because it helps them assess the performance of their investments and make informed decisions about whether to stay invested or adjust their strategy.

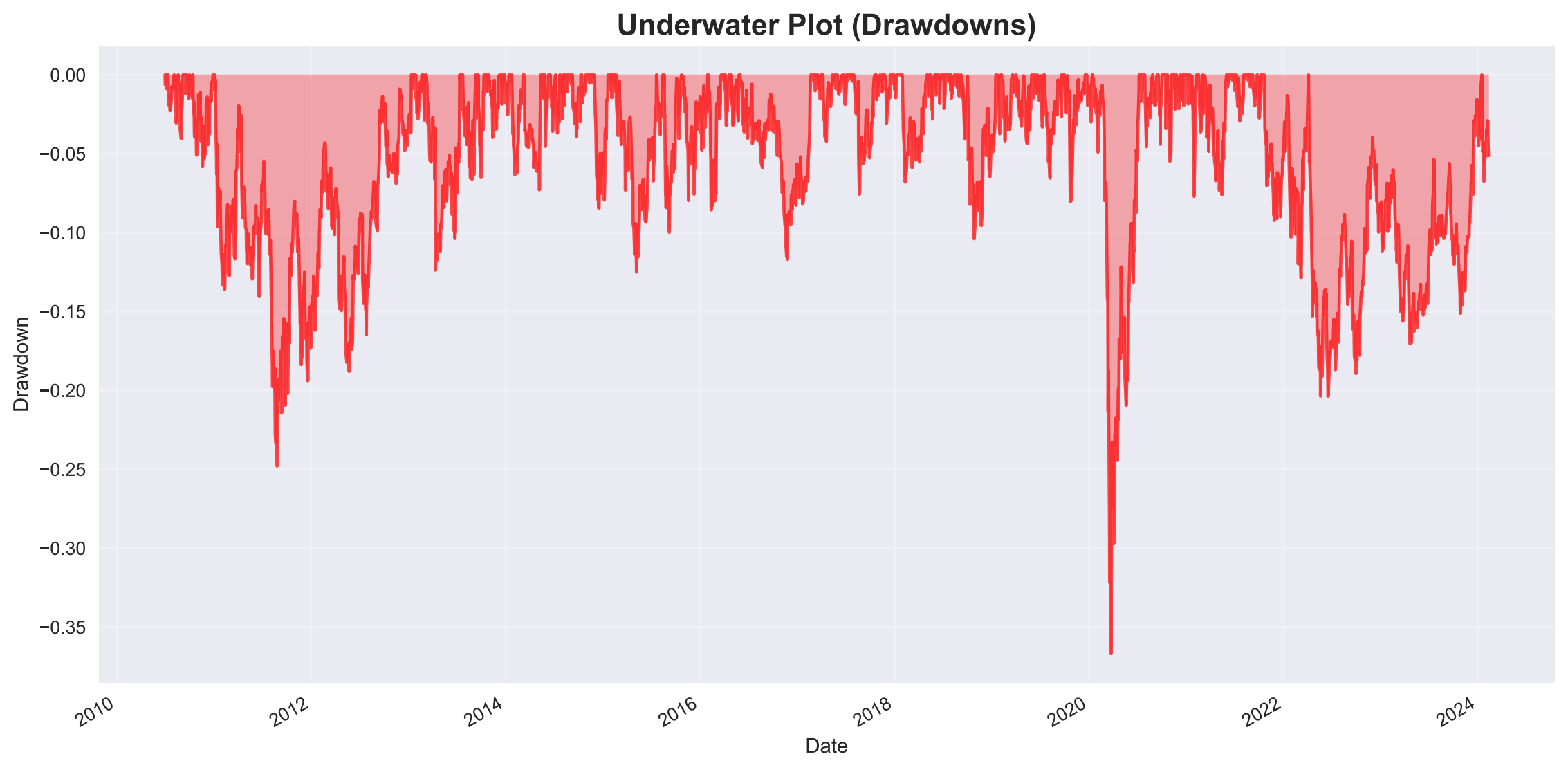
2. How to interpret patterns or trends visible:
In the chart, you can observe the growth (upward trend) or decline (downward trend) of the portfolio's value over time. A steep upward trajectory indicates strong performance, while a flat or declining line suggests underperformance relative to the benchmark. It is also helpful to compare the portfolio's performance with that of the benchmark to identify any deviations and understand the factors contributing to these differences.

3. What investors should look for in this type of chart:
Investors should pay attention to the overall trend of the line, as well as any significant peaks (best days) or troughs (worst days). They should also consider how the portfolio's performance compares to the benchmark and evaluate the consistency of their investment strategy. For example, if the portfolio consistently outperforms the benchmark during periods of market decline, it may indicate a well-diversified and resilient investment approach.

4. Key insights and actionable takeaways:
By analyzing the Cumulative Returns chart, investors can gain valuable insights into their portfolio's performance and risk profile. For instance, a high Sharpe Ratio suggests that the portfolio delivers higher returns for a given level of risk compared to the benchmark. A positive Calmar Ratio indicates that the portfolio has a good balance between risk and return, while a low Value at Risk (95%) shows that there's a low probability of experiencing significant losses in the next 95% of trading days.

5. How this relates to overall portfolio performance and risk management:
The Cumulative Returns chart is an essential tool for understanding portfolio performance and managing risk. By comparing the portfolio's trajectory against the benchmark, investors can assess whether their investment strategy is delivering the desired results. Additionally, analyzing metrics like Maximum Drawdown, Value at Risk (95%), and Expected Shortfall (95%) helps inv

estors gauge the potential downside risks in their portfolio and make adjustments as needed. This information is crucial for both novice and experienced investors to maintain a well-balanced and resilient investment strategy that aligns with their risk tolerance and financial goals.


Underwater Plot (Drawdowns)
0.00
−0.05
−0.10
−0.15
−0.20
−0.25
−0.30
−0.35
Drawdown
2010
2012
2014
2016
2018
2020
2022
2024
Date

ANALYSIS: DRAWDOWNS

1. What this chart shows and why it's important:
The Drawdowns chart is a visual representation of the periods when the portfolio was below its previous peak, indicating losses. It helps investors understand the magnitude and duration of those losses. This information is crucial because it provides insights into the portfolio's risk profile and can help determine if the investment strategy aligns with the investor's risk tolerance.

2. How to interpret the patterns or trends visible:
In this chart, the vertical lines represent individual drawdowns, while the horizontal lines indicate the peak values of the portfolio. The chart helps identify how long it takes for the portfolio to recover from losses and how deep those losses are. By observing the frequency and depth of drawdowns, an investor can gauge the volatility and riskiness of their portfolio.

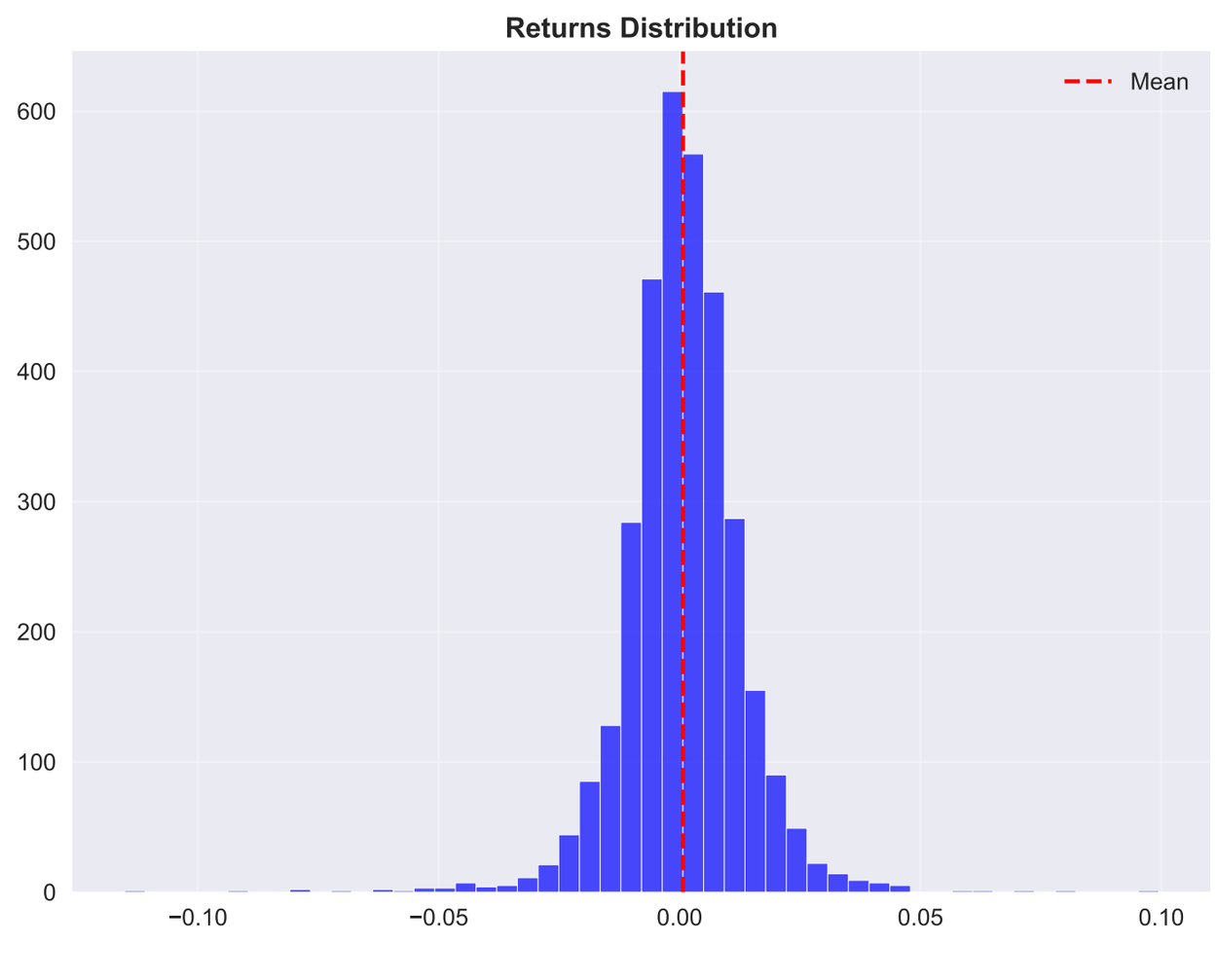
3. What investors should look for in this type of chart:
Investors should focus on the following aspects when analyzing a Drawdowns chart:
- Depth of drawdowns: The larger the drawdowns, the higher the potential risk associated with the investment.
- Frequency of drawdowns: Frequent and shallow drawdowns may indicate higher volatility, while infrequent and deep drawdowns suggest more significant risks.
- Recovery time: A quicker recovery from drawdowns indicates better risk management and lower potential losses.

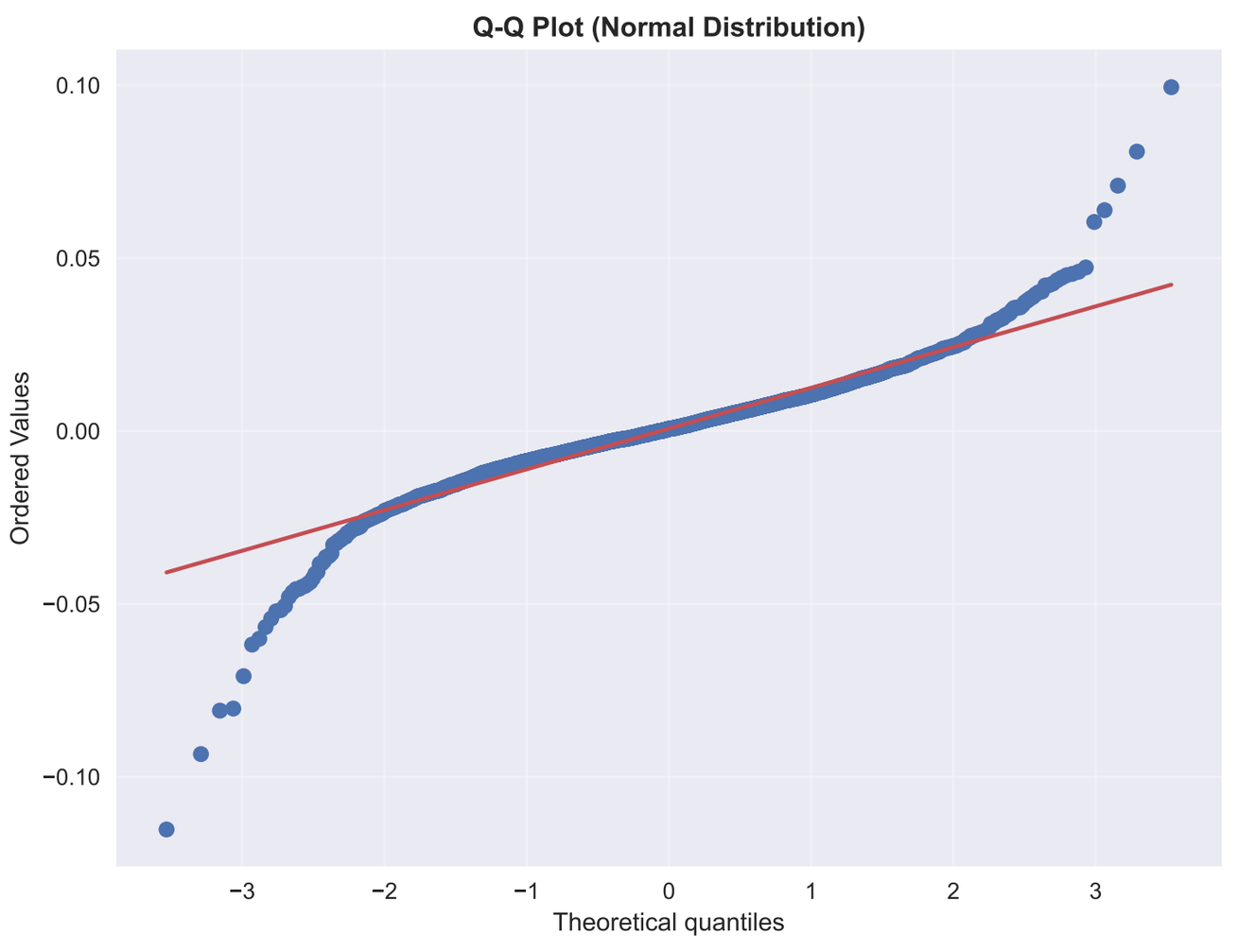
4. Key insights and actionable takeaways:
Based on the Drawdowns chart and portfolio metrics provided, here are some key insights and actions for investors to consider:
- The Maximum Drawdown of -0.366859019833523 indicates that at its worst point, the investor lost 36.69% of their initial investment. This suggests a moderate risk level in the portfolio.
- A Calmar Ratio of 0.31392796584920335 indicates that the portfolio returns are not significantly higher than the risk taken, which may imply that the investor might consider looking for better risk-adjusted investments.
- The Value at Risk (95%) and Expected Shortfall (95%) show a low probability of losing more than 1.94% and 3.09% of the portfolio value in a given period, respectively. This suggests that the investor's portfolio is relatively resilient to losses.
- The Win Rate of 52.50% indicates that the investor's strategy has been successful slightly more than half the time, which may be acceptable for some investors but could warrant further analysis or adjustment.

5. How this relates to overall portfolio performance and risk management:
The

Drawdowns chart is a crucial tool in understanding an investment's risk profile and how it aligns with an investor's risk tolerance. By analyzing the depth, frequency, and recovery time of drawdowns, investors can make informed decisions about their portfolio's overall risk level and performance.

For both novice and experienced investors, keeping track of these metrics and understanding the Drawdowns chart is essential for effective risk management and making data-driven investment decisions.


Returns Distribution
Mean
600
500
400
300
200
100
0
−0.10
−0.05
0.00
0.05
0.10


Q-Q Plot (Normal Distribution)
Ordered Values
0.10
0.05
0.00
−0.05
−0.10
−3
−2
−1
0
1
2
3
Theoretical quantiles

ANALYSIS: RETURNS DISTRIBUTION

1. What the chart shows and why it's important:
The Returns Distribution chart is a visual representation of how an investment portfolio's returns are distributed. It consists of two parts - a histogram showing the distribution of returns, and a Q-Q plot testing if the returns follow a normal distribution. This chart helps assess the risk characteristics of the portfolio, allowing investors to make informed decisions based on their risk tolerance and return expectations.

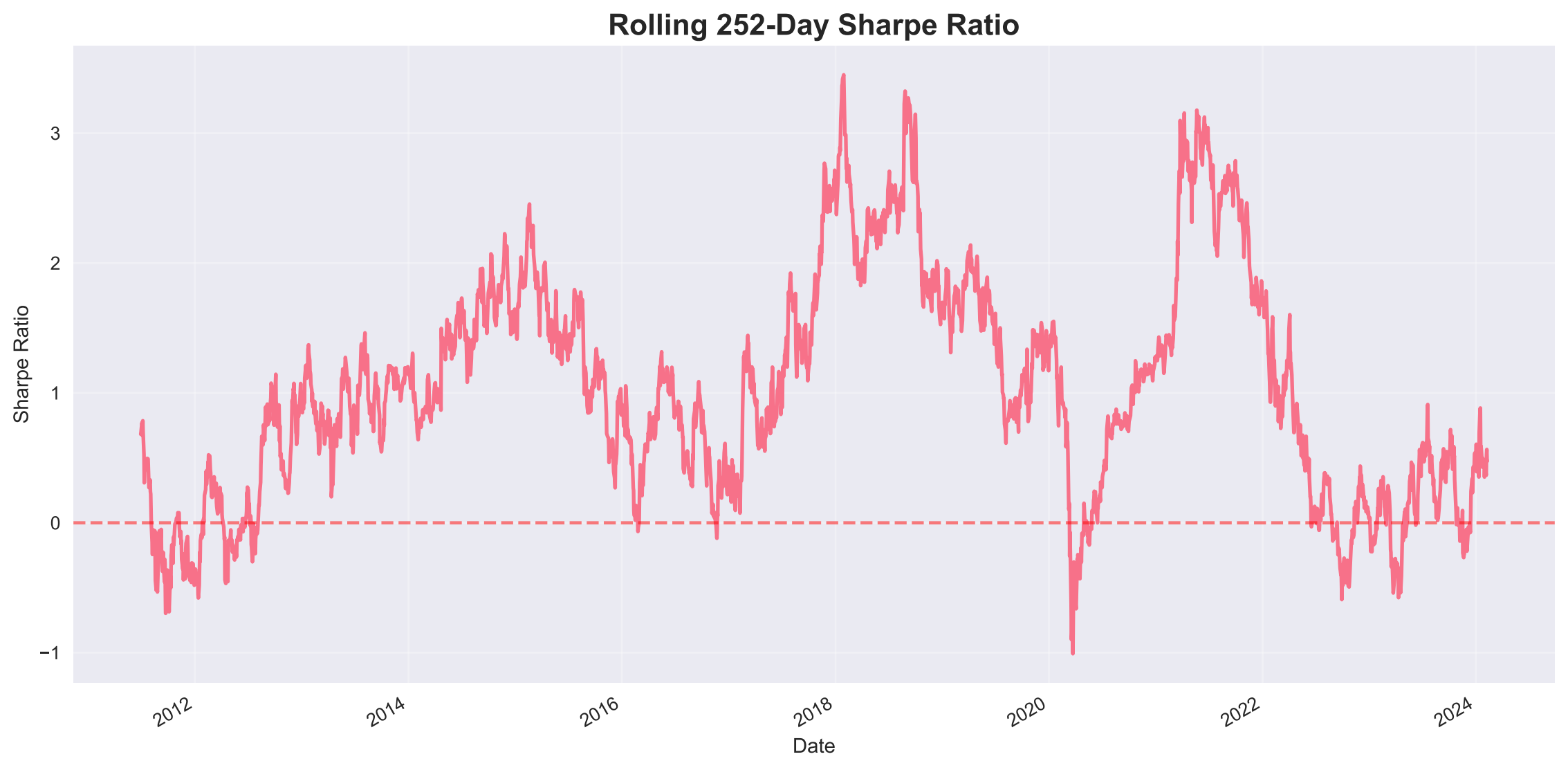
2. How to interpret the patterns or trends visible:
The histogram in this chart shows the frequency distribution of returns, with each bar representing the number of times a specific return occurred within the given time frame. The Q-Q plot compares the actual portfolio returns with an ideal normal distribution (a straight line) to determine if the returns follow a normal pattern or not. If the points on the Q-Q plot closely align with the line, it indicates that the returns are normally distributed.

3. What investors should look for in this type of chart:
Investors should pay attention to the shape and spread of the histogram, as well as the alignment of points in the Q-Q plot. A symmetrical histogram and a close alignment with the Q-Q line suggest a normal distribution of returns, which is generally considered desirable for portfolio management since it allows investors to rely on historical statistics for risk assessment.

4. Key insights and actionable takeaways:
If the Returns Distribution chart shows that returns are normally distributed, it indicates that the portfolio's risk can be effectively measured using standard deviation. Investors should also consider the skewness and kurtosis values to understand the portfolio's asymmetry and tail risk, respectively. High negative skewness or high kurtosis values may signal a higher likelihood of extreme events, which could impact an investor's risk tolerance.

5. How this relates to overall portfolio performance and risk management:
Understanding the distribution of returns in your portfolio is crucial for making informed decisions about risk exposure and performance expectations. A normal distribution indicates that the portfolio is well-diversified and follows a predictable pattern, which can help investors manage risk more effectively. However, if the distribution is skewed or has fat tails, it may indicate that the portfolio is exposed to less common but potentially impactful events, requiring adjustments in the investment strategy

or risk management approach.


Rolling 252-Day Sharpe Ratio
Sharpe Ratio
3
2
1
0
−1
2012
2014
2016
2018
2020
2022
2024
Date

ANALYSIS: ROLLING SHARPE

1. What this chart shows and why it's important:
The Rolling Sharpe chart is a visual representation of how the risk-adjusted returns (Sharpe ratio) evolved over time for a specific portfolio. The Sharpe ratio is an important metric because it helps investors understand the performance of their investments relative to the level of risk involved. A higher Sharpe ratio indicates better risk-adjusted performance, meaning that the investor is getting more return per unit of risk taken. This chart helps investors make informed decisions about their portfolio, as they can identify periods when the portfolio had a good risk-reward balance and periods when it did not.

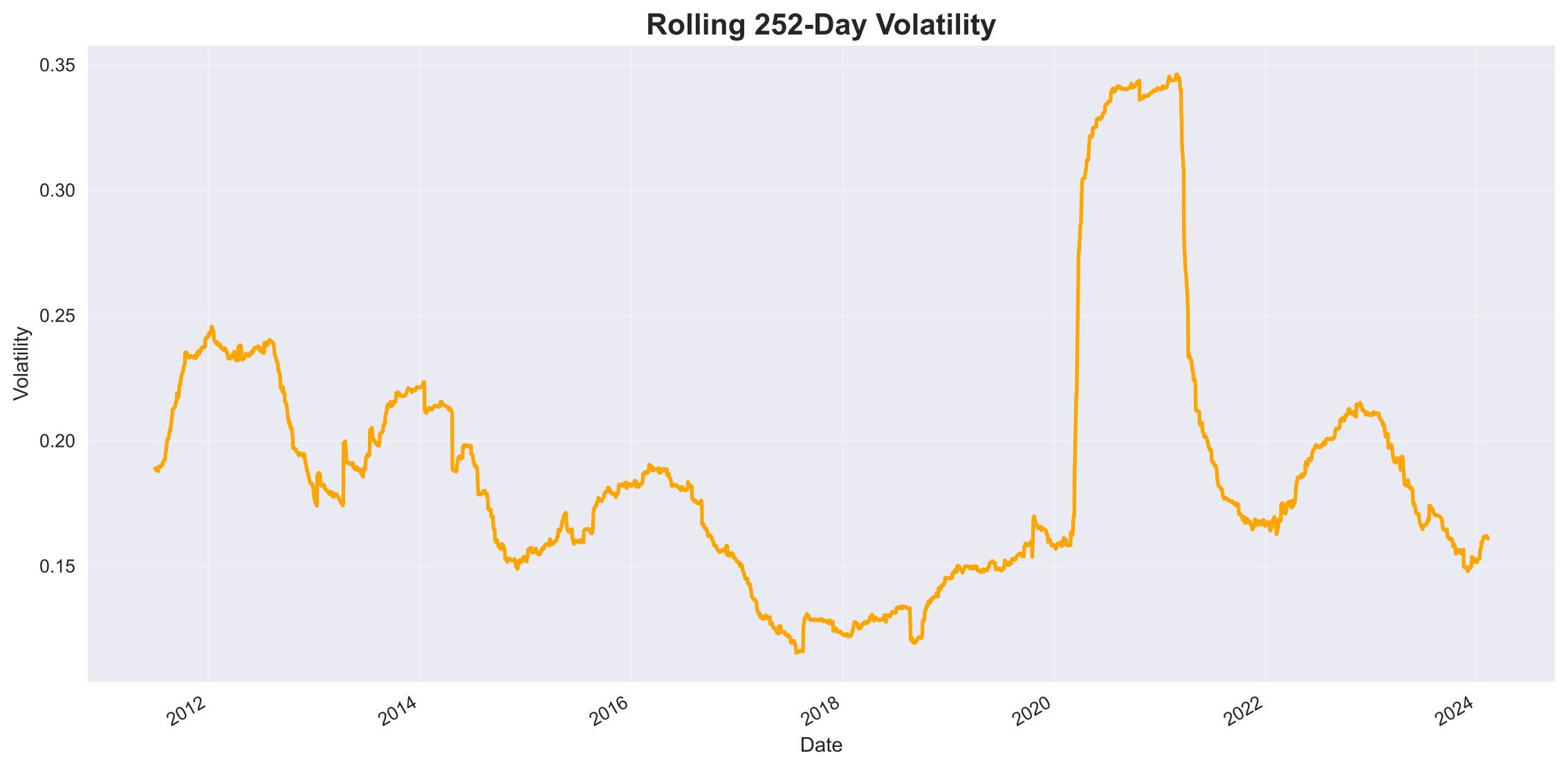
2. How to interpret the patterns or trends visible:
The Rolling Sharpe ratio chart shows a series of points plotted over time, with each point representing the Sharpe ratio for a specific period (usually a month). The trend lines in the chart help visualize the fluctuations in risk-adjusted performance. Investors should look for patterns such as sustained high or low values, sharp increases or decreases in the ratio, or periods of consistency. These patterns can provide insights into the portfolio's overall performance and risk management strategy.

3. What investors should look for in this type of chart:
When interpreting a Rolling Sharpe chart, investors should pay attention to the following aspects:
- The general trend of the ratio over time: Is it increasing, decreasing, or remaining stable?
- Any periods of high or low Sharpe ratios: This could indicate periods when the portfolio's performance was particularly good or bad relative to its risk.
- The consistency of the ratio: A more consistent chart may indicate a more stable and reliable investment strategy.
- Any external factors that might have affected the ratio, such as market events or changes in the portfolio composition.

4. Key insights and actionable takeaways:
Based on the Rolling Sharpe chart, investors can gain the following insights and takeaways:
- Understand how their portfolio's risk-adjusted performance has evolved over time.
- Identify periods when the portfolio was more or less successful in managing risk and generating returns.
- Compare the portfolio's performance to benchmarks or other portfolios to see if it is meeting expectations.
- Adjust the investment strategy based on the insights gained from the chart, such as reducing exposure to high-risk assets during periods of low Sharpe ratios or increasing exposure during p

eriods of high ratios.

5. How this relates to overall portfolio performance and risk management:
The Rolling Sharpe chart is a valuable tool for assessing an investment portfolio's overall performance and risk management strategy. By monitoring the Sharpe ratio over time, investors can make informed decisions about adjusting their portfolios to better align with their risk tolerance and investment goals. This chart also helps identify potential areas of improvement in the portfolio's risk-adjusted performance, which can lead to better long-term results. In summary, a Rolling Sharpe chart is an essential tool for both novice and experienced investors looking to optimize their portfolios and manage risk effectively.


Rolling 252-Day Volatility
0.35
0.30
0.25
0.20
0.15
Volatility
2012
2014
2016
2018
2020
2022
2024
Date

ANALYSIS: ROLLING VOLATILITY

1. What this chart shows and why it's important:
The Rolling Volatility chart displays the changes in portfolio volatility over time, with higher volatility periods indicating more uncertain returns. This chart is essential because it helps investors understand how their portfolio's risk has evolved, allowing them to make informed decisions about adjustments or rebalancing.

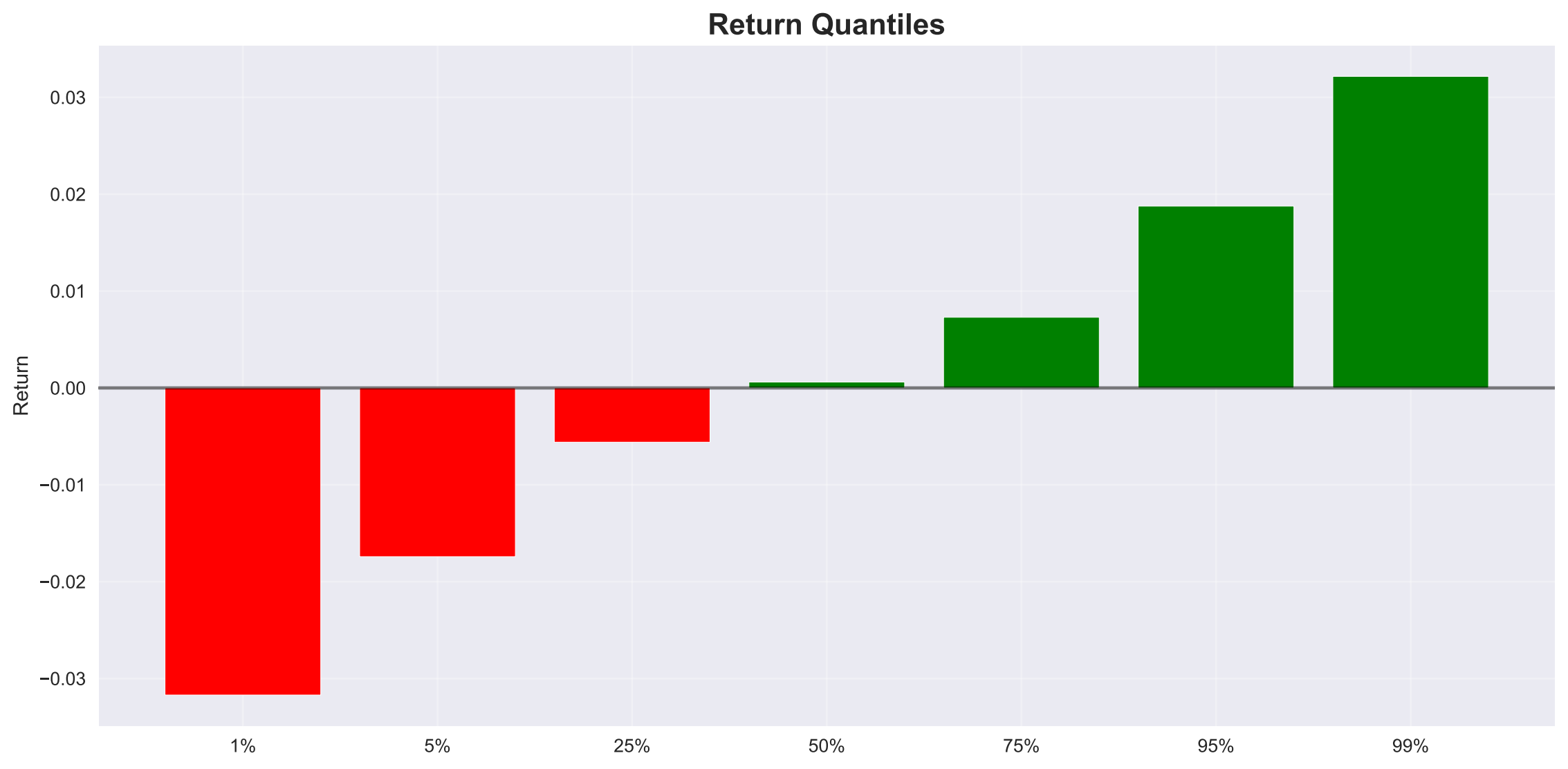
2. How to interpret the patterns or trends visible:
To interpret the patterns in this chart, look for trends such as increasing or decreasing volatility levels, periods of high volatility followed by low volatility (or vice versa), and any seasonal patterns that may emerge. These trends can give insights into how the portfolio is reacting to market conditions, its exposure to risk factors, and the effectiveness of the investment strategy employed.

3. What investors should look for in this type of chart:
Investors should look for:
- Consistent or fluctuating levels of volatility over time
- Any sudden spikes in volatility that may indicate market events or changes in portfolio holdings
- Periods of relatively stable or low volatility, which could signal a more predictable investment environment
- Any correlations between changes in volatility and the overall performance of the portfolio

4. Key insights and actionable takeaways:
By analyzing the Rolling Volatility chart, investors can gain key insights and make informed decisions:
- If the portfolio's risk level is consistently high, it may be necessary to reevaluate the investment strategy or consider reducing exposure to riskier assets
- If volatility levels are fluctuating significantly, it might indicate a need for more frequent rebalancing or adjustments to the portfolio
- Identifying periods of low volatility can help investors capitalize on more stable market conditions and potentially improve overall returns
- Understanding the relationship between risk and return can inform decisions about taking on additional risk to pursue higher returns, or conversely, focusing on preserving capital during uncertain times

5. How this relates to overall portfolio performance and risk management:
The Rolling Volatility chart is an important tool for assessing portfolio performance and managing risk. By monitoring changes in volatility levels, investors can make proactive decisions to adjust their portfolios according to their risk tolerance, investment goals, and market conditions. Additionally, this chart helps identify periods of high or

low risk exposure, enabling investors to better understand the implications of their investment choices on overall portfolio performance. In summary, understanding the Rolling Volatility chart is crucial for both novice and experienced investors in making informed decisions about their investments and risk management strategies.


Return Quantiles
Return
0.03
0.02
0.01
0.00
−0.01
−0.02
−0.03
1%
5%
25%
50%
75%
95%
99%

ANALYSIS: RETURN QUANTILES

1. What this chart shows and why it's important:
The Return Quantiles chart shows the distribution of returns at different percentile levels, helping to understand the range of potential outcomes in an investment portfolio. By analyzing the performance of a portfolio across various return percentiles (e.g., the top 10%, 25%, 50%, etc.), investors can get a better understanding of how their investments might perform under different scenarios. This is important because it provides insights into the risk-return profile of the portfolio, which helps in making informed decisions about investment strategies and risk management.

2. How to interpret the patterns or trends visible:
In the Return Quantiles chart, the x-axis represents different percentile levels (e.g., 10th percentile, 25th percentile, 50th percentile, etc.), while the y-axis shows the returns at each respective percentile. The chart may display a histogram or a series of bars to represent the distribution of returns across various percentiles. A well-diversified portfolio typically has a bell curve-like distribution, indicating that returns are distributed evenly across different percentiles. This implies that the portfolio has a balanced risk-return profile and is less susceptible to extreme outcomes.

3. What investors should look for in this type of chart:
Investors should look for the following aspects in a Return Quantiles chart:
- A bell curve or symmetrical distribution, indicating a well-balanced risk-return profile.
- The overall range of returns across different percentiles, which gives an idea of the potential outcomes and volatility.
- Any skewness (i.e., the distribution is more focused on one side) or kurtosis (i.e., the presence of extreme events), indicating that the portfolio may have a higher probability of certain types of returns or extreme events.

4. Key insights and actionable takeaways:
Based on the Return Quantiles chart, investors can derive several key insights and takeaways:
- The distribution of returns across different percentiles helps in understanding the risk-return profile of the portfolio and how it may perform under various scenarios.
- Investors should be aware of any skewness or kurtosis in the distribution, as it could indicate a higher probability of certain types of returns or extreme events.
- If the distribution is skewed heavily towards negative returns (e.g., high tail risk), investors may consider rebalancing their portfolio to reduc

e exposure to high-risk assets.
   - A well-diversified portfolio should have a relatively symmetrical distribution, indicating that it can perform well across various market conditions.

5. How this relates to overall portfolio performance and risk management:
The Return Quantiles chart helps in understanding the overall performance and risk profile of a portfolio. By analyzing the distribution of returns at different percentile levels, investors can make informed decisions about their investment strategies, risk management, and asset allocation. A well-diversified portfolio with a balanced risk-return profile is less susceptible to extreme events and has a higher probability of achieving the desired returns. This chart serves as a valuable tool for both novice and experienced investors in managing their portfolios effectively and making data-driven decisions.


Top 10 Best Days
Portfolio
Benchmark
0.10
0.08
0.06
0.04
0.02
0.00
0
2
4
6
8
Top 10 Worst Days
Portfolio
Benchmark
0.00
−0.02
−0.04
−0.06
−0.08
−0.10
−0.12
0
2
4
6
8

ANALYSIS: BEST/WORST DAYS

1. What the chart shows and why it's important:

The "Best/Worst Days" chart compares the best and worst performing days of an investment portfolio to its benchmark. This analysis is crucial for understanding how the portfolio performs under extreme market conditions, as well as evaluating the investor's risk tolerance and potential rewards. By analyzing this information, investors can make informed decisions about their portfolio's performance, risk exposure, and overall strategy.

2. How to interpret the patterns or trends visible:

To interpret the chart, look for the following metrics:
- Best Day: The highest return day of the portfolio compared to the benchmark. This indicates the potential upside of the investment.
- Worst Day: The lowest return day of the portfolio compared to the benchmark. This shows how much the portfolio can lose during extreme market conditions.
- Profit Factor: Ratio of average profit per trade to average loss per trade. A higher value indicates better performance and risk management.
- Tail Ratio: Measures the presence of extreme negative events in the portfolio compared to the benchmark. A higher value means fewer extreme losses, which is favorable for investors.

3. What investors should look for in this type of chart:

Investors should look for the following characteristics in this chart:
- High Best Day and Lowest Worst Day values indicate better performance under extreme market conditions.
- A high Profit Factor suggests better risk management and overall performance.
- A higher Tail Ratio means fewer extreme losses, which is a positive sign for investors seeking to minimize downside risk.

4. Key insights and actionable takeaways:

Based on the chart analysis, consider the following insights and actions:
- If the portfolio has a high Best Day value and a low Worst Day value, it means the investment performs well in both bullish and bearish markets. This can be considered a good sign for investors looking for consistent performance.
- A high Profit Factor and Tail Ratio indicate better risk management and fewer extreme losses, which are important factors for investors seeking to protect their capital.
- If the portfolio has a low Best Day or high Worst Day value, it might be necessary to reassess the investment strategy or consider diversifying the portfolio to reduce exposure to certain risks.

5. How this relates to overall portfolio performance and risk management:

Understanding the best and worst days of a portfoli

o is crucial for assessing its overall performance and risk profile. A well-balanced portfolio should perform consistently under various market conditions, with minimal extreme losses. By analyzing the Best/Worst Days chart, investors can identify areas where their portfolio might be exposed to unnecessary risks or underperforming assets. This information can then be used to make informed decisions about reallocating assets or adjusting the investment strategy to better align with the investor's risk tolerance and financial goals.