

Description of the Analysis

Objective

The aim of this project is to explore and communicate the performance characteristics of a trading strategy using advanced data visualisation techniques in R. The focus is placed strictly on how results are presented and interpreted visually, rather than on the underlying modelling or forecasting methodology.

The analysis addresses three complementary questions:

1. How does strategy performance evolve across different market regimes?
2. What happens during periods of extreme risk, such as the worst drawdown?
3. Which periods contribute most to the overall performance of the strategy?

Data Overview

The analysis is based on a dataset created by myself, containing daily observations of a long-short trading strategy applied to the FTSE 100 index. The dataset includes:

- cumulative strategy performance,
- daily strategy returns,
- market returns,
- position indicators,
- closing price.

For the basis of visualisations, rolling risk measures such as volatility and drawdown were computed using the given data.

Regime-Aware Performance Visualisation

The first visualisation presents the long-term evolution of strategy performance in comparison with a passive benchmark. Market regimes, derived from the strategy's position signals, are highlighted using background shading.

This design allows the audience to directly associate changes in performance with different exposure states, making it easier to understand when and under which conditions the strategy diverges from the benchmark. The visualisation combines multiple layers time series, regime shading, and reference lines to provide a comprehensive yet readable overview.

Worst Drawdown in Context

The second figure focuses on the most severe drawdown observed in the sample. By zooming into this period, the visualisation places the drawdown in its broader risk context, combining the equity curve with additional risk indicators.

Rather than presenting drawdowns as isolated statistics, this approach emphasizes their temporal structure and relationship with changing market conditions. This visual framing helps the viewer understand not only the depth of the loss, but also the surrounding dynamics that led to it.

Attribution of Performance Across Time

The final visualisation uses a treemap to decompose total strategy performance by calendar year. Tile area represents the magnitude of each year's contribution, while color encodes the direction and relative size of annual returns.

This aggregated view shifts the focus from time-series dynamics to attribution. It highlights whether overall performance is driven by many moderate years or by a small number of extreme periods. The treemap format was chosen to communicate relative importance efficiently, without relying on precise numerical comparison.

Conclusion

Together, the three visualisations form a coherent narrative: from long-term regime dependent performance, through periods of concentrated risk, to an aggregated attribution of results over time.

The project demonstrates how advanced visualisation techniques in R can be used to extract and communicate insights from financial data, emphasizing clarity, structure, and interpretability over market complexity.

Best wishes,

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