Spencer Chavez

Sector-Risk Dashboard: Sharpe Ratios & Drawdowns for S&P 500 Sectors (2019-2024)

GitHub

Job: *Investment Risk Analyst – TCW Group*

Why: The posting emphasizes quantitative risk analysis across a multi-asset universe and explicitly requires SQL proficiency—exactly the skills showcased in this project.

Relevance: I aim to eventually transition my career to a buy-side team, where I could use data to inform portfolio decisions. Building a sector-risk dashboard mirrors the daily analytics TCW's team delivers.

Interest: I'm passionate about translating raw market data into actionable insights; the role's focus on "data-driven risk/reward analysis" aligns perfectly with that interest.

Problem

Problem Statement: Identify which S&P 500 sectors have delivered the best risk-adjusted performance (Sharpe ratio, max drawdown, rolling volatility) over the last five years and how their risk profiles compare with the broad index.

Relevance: A sector-level risk snapshot helps TCW's analysts spot concentrations, stress-test portfolios, and communicate risk to portfolio managers and clients.

Feasibility: Daily price series and sector classifications fit comfortably into a relational schema. SQL window functions and CTEs handle the calculations; a lightweight ETL plus Tableau/Power BI completes the pipeline.

Data Sources

API: Alpha Vantage Daily Time-Series or Yahoo Finance

- Free, well-documented, delivers years of equity prices needed for risk metrics

Scrape: Wikipedia "List of S&P 500 companies" – tickers + GICS sectors

- Provides current constituent list and sector tags for grouping returns

---

Solution

Plan: I will analyze daily price data of S&P 500 companies and sector ETFs to calculate risk-adjusted return metrics. The data will be loaded into a MySQL database, processed using SQL queries, and visualized in Excel to highlight sector performance trends and risk profiles over time.

Queries and Visualizations: SQL queries will calculate daily returns, 60-day rolling averages and volatility using window functions, and derive Sharpe ratios and maximum drawdowns by sector. The results will be joined with sector metadata and stored in a summary view. Excel (via Power Query) will connect to this view to create a heat map of Sharpe ratios, a pivot table of risk metrics by sector, and a line chart comparing cumulative returns of sector ETFs.