RoboPort

Roles

- Project Manager: Alfred
- Technical Lead: Vishnu
- Business Analyst: Chris
- Quality Assurance Specialist: Serena
- Team Member: Diana

Speakers

- Executive Summary: Chris
- Concept: Chris
- User Story: Alfred
- Investment Analysis Methods: Alfred
- Approach: Serena
- Demo: Vishnu
- Next Steps: Diana

Executive Summary

A revolutionary portfolio optimization platform designed to empower investors with personalized investment strategies

Concept

- A user-friendly web-based tool where investors can enter their stock portfolio and see in-depth return and portfolio analysis
- Provides recommendations to adjust portfolio allocations through three advanced methodologies
- Helps retail investors compete in the market through well-balanced portfolios that maximize returns while minimizing risk

User Story

Investor opens webpage and enters their investment $ amount, tickers, & percentage allocation and see the following:

- 1 Year Historical returns ($ & %) by ticker
- 1 Year Portfolio returns ($ & %)
- 3 newly calculated portfolio weights with historical 3 year performance
- Final historical comparison of the different allocations
- User can now choose the best method and allocation going forward

Investment Analysis Methods

Markowitz Portfolio Optimization

- Allocates assets based on their expected returns and correlations, aiming to maximize portfolio returns for a given level of risk (low risk in this project)

Risk Parity Analysis

- Risk Parity strategy allocate portfolio weights based on the volatility of each asset, aiming to equalize risk contributions across the portfolio.

Beta Weighting

- Beta Weighting recalculates the weights of each asset to ensure that the portfolio beta will equal the target market beta, rebalancing the portfolio.

Approach

Technologies

- Python
- Pandas and NumPy:
- Streamlit/HTML/CSS/JavaScript
- Plotly and Matplotlib:

Data Sources

- Yahoo Finance for stock data due to cost (free) and accessibility
- US Treasury Risk Free Rate

Challenges

- Researching for the datasets
- Development of code for Markowitz
- Developing Beta Weighting strategy

Successes

- Cleaning data
- Using visualizations
- Usage of the new Python library
- This product can be developed more

Thank you!

Q & A

Demo

Next Steps

- Incorporate investor risk thresholds: low, medium, high
- Increase years of backtest to 10+
- Rebalance portfolio with different stocks as opposed to changing weights only
- Embed tool in investors trading platform

- Additional questions that surfaced.

1.How will RoboPort differentiate itself from existing portfolio optimization platforms and address any gaps or shortcomings in the current market offerings?

2. What methodologies will be used to assess the robustness and sensitivity of optimization results to changes in input parameters or market conditions?

- Additional topics to research:

1.Advanced optimization techniques beyond Markowitz portfolio theory, Risk Parity, and Bet Against Beta, such as Black-Litterman model or Bayesian optimization.

2.Real-time portfolio monitoring and alerts for users to stay informed about changes in their portfolios or market conditions.

- Plan for future development.

1.Incorporate social features: Enable users to share portfolio strategies, discuss investment ideas, or follow other investors' portfolios.

2.Develop mobile applications: Create mobile versions of RoboPort for convenient access and on-the-go portfolio management.

Links

- Deployed application.
- GitHub repo.
- https://home.treasury.gov/resource-center/data-chart-center/interest-rates/TextView?type=daily_treasury_yield_curve&field_tdr_date_value=2023
- https://finance.yahoo.com/
- https://medium.com/
- https://www.quora.com/Corporate-Finance-If-you-are-given-a-beta-how-do-you-determine-portfolio-weights