Sector-Based Relationship in US Trading and Portfolio Performance

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Quantitative Finance I

Project Pitch

October 15, 2024

Overview

- This project investigates the interconnectedness of different market sectors within the US market and evaluates how these relationships influence portfolio performance.
- We will utilize regression analysis to identify historical correlations between sectors, apply Markov models to predict transitions between sector states, and measure the impact on portfolio performance using Fama-French factors and performance metrics.

Motivation

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- Understanding sector interrelationships can improve portfolio diversification.

Motivation and Background

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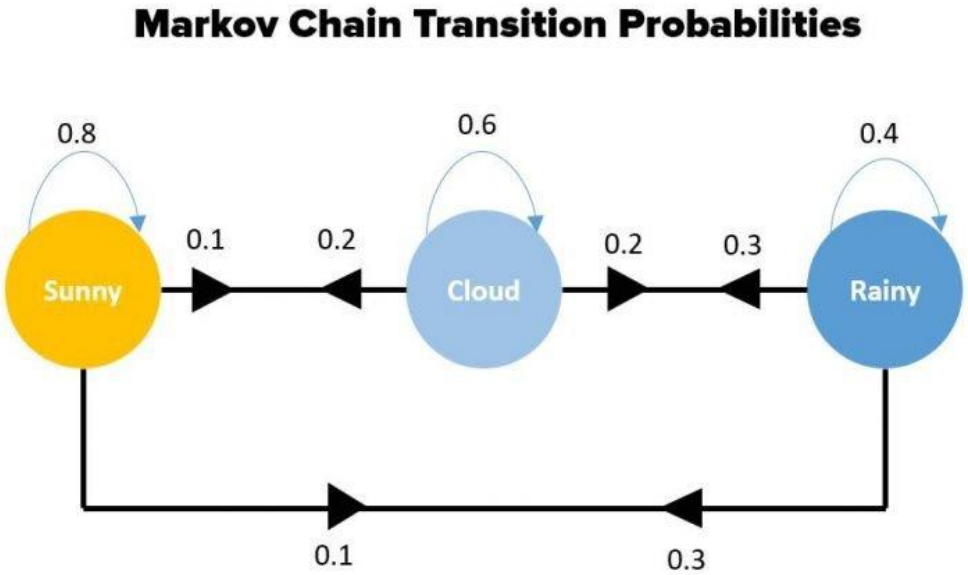
- Insights into sector transitions can enhance predictive models for investment strategies.



In our case, the states would be financial, e.g., stagnant, profit, or loss.

Motivation and Background

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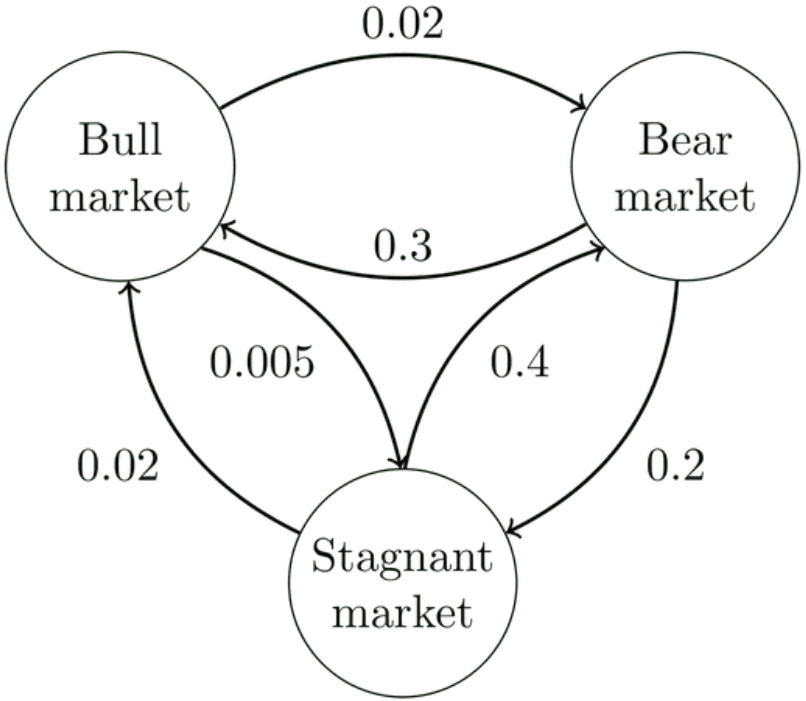
- Insights into sector transitions can enhance predictive models for investment strategies
- Strategies may include analyzing and anticipating market trends, optimizing asset allocation, and timing investments, etc.

Key Research Questions

1. What are the historical correlations between different US market sectors over the past decade?
2. How do these correlations impact the risk and return of a diversified portfolio?
3. Can Markov models predict sector transitions, and what insights can be drawn from these predictions?
4. How do sector-based correlations and transitions impact portfolio performance measured with Fama-French factors?



Methodology

- **Historical Data**
  - Yahoo Finance for historical stock prices and sector indices.
  - Fama-French Data Library for performance metrics.
- **Sectors to Include**
  - Technology, Healthcare, Financials, Real Estate, Financials, Industrials, Consumer Discretionary, Utilities, Energy
- **Portfolio Size**
  - ~ 10-20 representative stocks per sector, focusing on the largest companies.

- **Performance metrics**
  - *Sharpe Ratio*: Measures risk-adjusted return.
  - *Sortino Ratio*: Focuses on downside risk.
  - *Alpha*: Excess returns of a portfolio relative to a benchmark index.

Significance and Impact

- Insight into sector correlations and transitions
- Enhanced predictive models for portfolio management
- Practical application of quantitative finance methods covered in class

References

1. Fama, E. F., & French, K. R. (1992). “The Cross-Section of Expected Stock Returns.” Journal of Finance, 47(2), 427-465.

2. Gu, S., Kelly, B., & Xiu, D. (2020). “Empirical Asset Pricing via Machine Learning.” The Review of Financial Studies, 33(5), 2223-2273.

Thank you for listening!

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