

Maximizing Profit and Managing Risk: A Sector-based Diversification Strategy for Stock Portfolio Optimization

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Introduction

Our senior thesis for the Finance Major involves managing a portfolio of five stocks with a figurative investment of \$1,000,000. We carefully select stocks based on historical performance, macroeconomic trends, and information from the Federal Reserve, and diversify our portfolio to mitigate risks. Our investment strategy includes two risky stocks (NVIDIA and VMware) and three safer stocks (JM Smucker, Kinder Morgan, and Walt Disney). We utilize Portfolio Theory and Capital Asset Pricing Model (CAPM) to determine optimal weights for our portfolio. Despite small fluctuations in stock prices over the past three months, our portfolio has yielded \$180,207, thanks to our use of CAPM to take on more risk.

Methods

Portfolio Theory Analysis

After employing a thorough analysis using the Portfolio Theory Model, we have successfully determined the optimal weights for the 5 stocks that we have carefully selected for our investment portfolio. The optimal weights, which have been computed based on the principles of modern portfolio theory, are as follows: SJM: 55%, KMI: 0%, VMW: 0%, NVDA: 45%, DIS: 0%.

However, given our investment strategy and risk appetite, we have decided to intentionally take on a slightly higher level of risk in order to potentially enhance our returns. As mentioned earlier, our objective is to distribute more weight to the other stocks in our portfolio, which may result in increased overall risk.

CAPM Analysis

The analysis found that each of the five stocks had different expected returns and systematic risks. NVDA had the highest alpha of 0.96, followed by SJM at 0.06, VMW at -0.54, DIS at -0.74, and KMI at -0.57. The positive alphas for NVDA and SJM indicate that these stocks are expected to provide a return that is higher than the risk-free rate of return. The betas of the stocks varied from 0.19 for SJM to 1.81 for NVDA. Stocks with a beta of 1 have the same systematic risk as the market, while stocks with a beta greater than 1 are more volatile than the market. In this analysis, NVDA had the highest beta, meaning that it is more volatile than the market and has the possibility for higher returns. On the other hand, SJM had the lowest beta, showing that it is less volatile than the market and has lower potential returns.

Portfolio Allocation:

The information from the CAPM analysis was used to determine the optimal weights for the five stocks in the portfolio. The weights were chosen based on the expected returns and systematic risks of the stocks, as estimated by the regression coefficients. For example, the analysis found that NVDA had the highest expected return and highest systematic risk, indicating that it has the potential for higher returns but also greater volatility. As a result, NVDA was assigned the highest weight of 40% in the portfolio to capitalize on its potential returns. On the other hand, SJM had a relatively low expected return and low systematic risk, indicating that it is a safer investment but with lower potential returns. As a result, SJM was assigned a weight of 30% in the portfolio to provide stability and diversification. KMI and VMW were assigned weights of 15% and 10%, respectively, based on their expected returns and systematic risks. DIS was assigned the lowest weight of 5% due to its negative expected return.

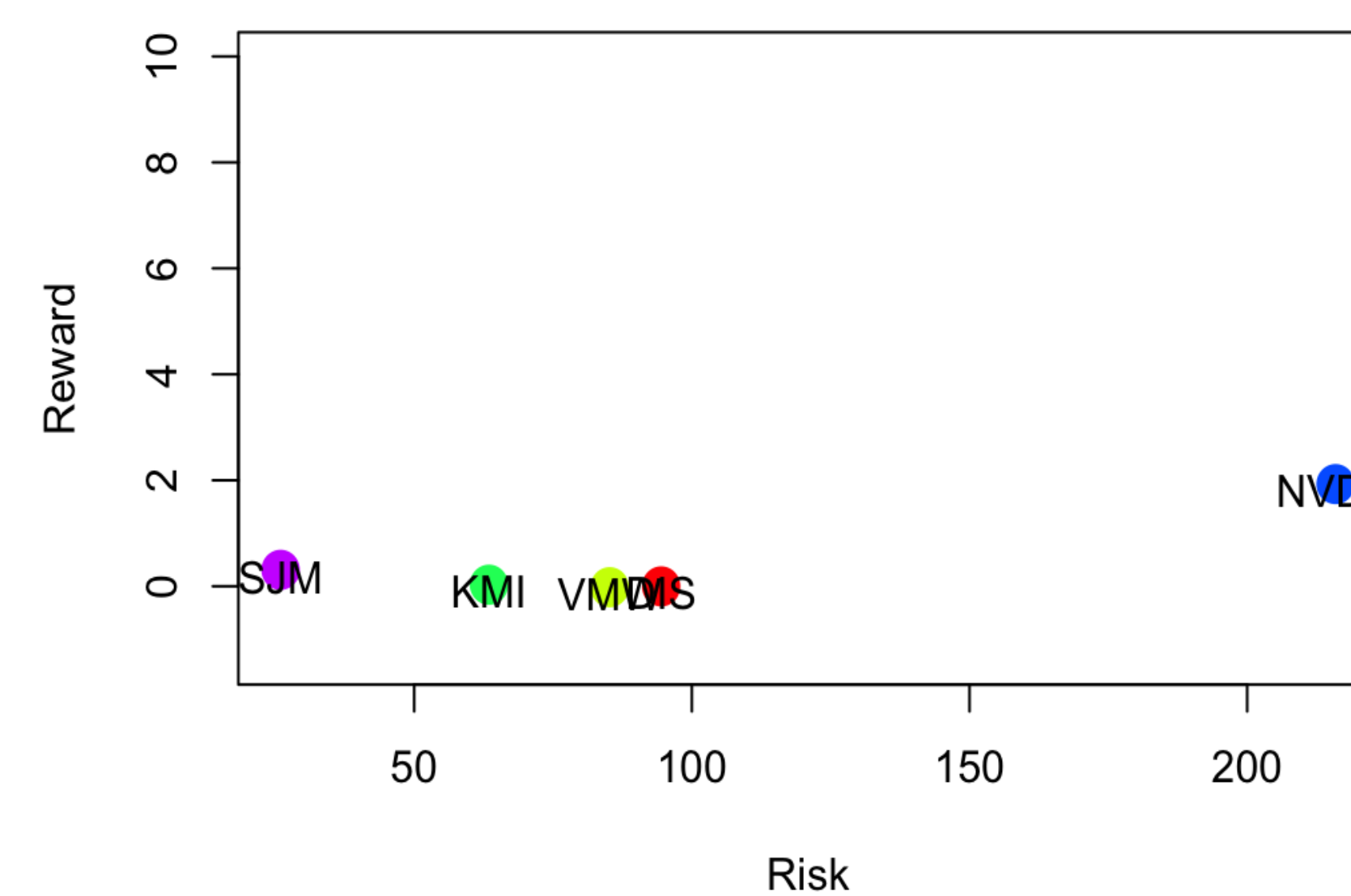
CAPM Results

Stocks	DIS	VMW	KMI	NVDA	SJM
Alphas	-.737	-.539	-.565	-.958	.060
Betas	1.28	.798	.965	1.811	.187

Expected Returns

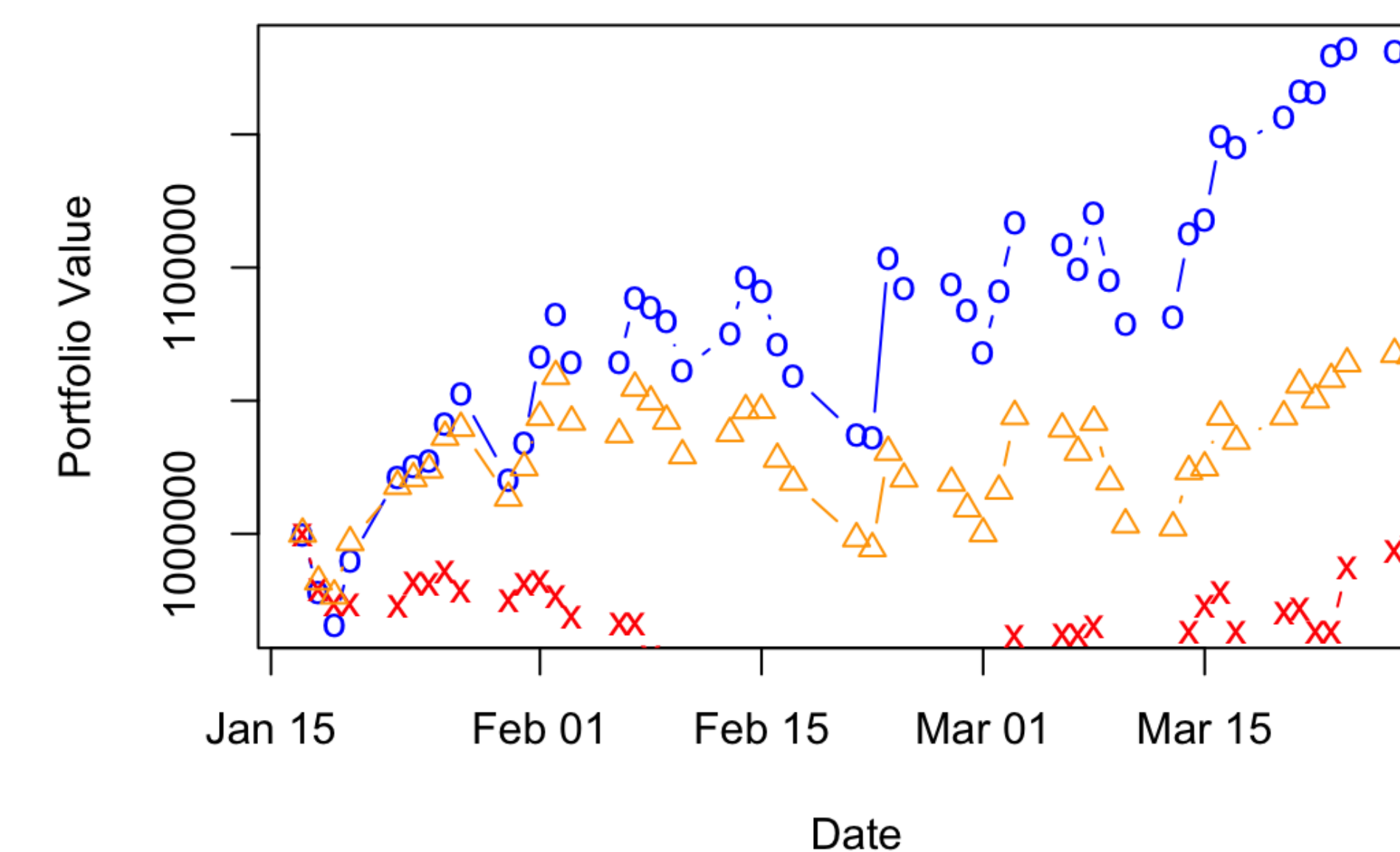
SJM	KMI	VMW	NVDA	DIS
30.97%	2.94%	-1.79%	192.78%	-.276

Risk vs. Reward Analysis



Our analysis indicates that most of our stocks are associated with low to moderate risk and limited potential for high rewards, while NVIDIA is considered high risk with little expected reward. Despite historical data suggesting minimal upside for our stocks, we believe recent macroeconomic trends may provide an opportunity for our portfolio to outperform predictions. We have chosen stocks from sectors essential for maintaining consumer lifestyles, which may perform well during an economic downturn. Despite the low predicted risk-to-reward ratio, we remain optimistic about our portfolio's potential performance, considering current macroeconomic trends and our understanding of consumer needs. While acknowledging inherent risks in stock investing, we remain confident in our strategy based on our analysis of various factors.

Results



	Starting Value	Final Value	Gain/Loss
Final Portfolio	\$1,000,000	\$1,180,207	\$180,207
PT Portfolio	\$1,000,000	\$994,968	-\$5,032
Equal Weights	\$1,000,000	\$1,066,972	\$66,972

Our final portfolio price for the project was \$1,180,207.8, resulting in a profit of \$180,207 from the initial investment of \$1,000,000. It's worth noting that we also utilized an equal weight portfolio strategy, which yielded a gain of only \$66,972. In contrast, the suggested weights provided by our Portfolio Theory Model resulted in a loss of \$5,032 with a final value of \$994,968.9. The substantial growth we experienced was primarily attributed to the success of Nvidia, a stock that we had projected to perform well and has seen an 80% increase since the beginning of the year.

Conclusions

Our investment journey has demonstrated the significance of diversification through sector analysis as a key strategy for portfolio success. Through careful evaluation and selection of sectors based on thorough research and analysis, we have been able to mitigate risks, capitalize on opportunities, and improve our portfolio's resilience to market fluctuations. This approach has allowed us to carefully position our investments, reduce concentration risk, and achieve favorable outcomes while navigating the dynamic landscape of finance. Leveraging sector analysis as an efficient tool in our decision-making process has provided us with valuable insights into sector performance, allowing us to identify top-performing sectors and make informed investment decisions. Compared to other strategies, our approach of diversification through sector analysis has proven to be advantageous, enabling us to optimize our chances of success and achieve long-term success in our investment endeavors. As we continue on our investment journey, we will continue to prioritize diversification through sector analysis as a fundamental pillar of our investment strategy, positioning ourselves for continued success in the ever-evolving world of finance.

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