Case study Write-Up #2

MET AD 731 A1: Corporate Finance

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Alex Sharpe Case Study

As a conservative investor, our traditional approach involved securely holding "the market portfolio" through passive investing, specifically in market value-weighted indexes like S&P 500 or mutual index funds such as the Vanguard 500 Index Fund. This tried-and-true approach was valued for its efficiency, providing higher expected returns with lower risk. The sense of security offered by passive investing meant restful nights and preserved our precious time, nerves, and energy. However, this case study prompts a shift from passive to active investing. Instead of relying solely on the Vanguard 500 Index Fund, we are exploring the inclusion of a specific stock in our modest portfolio. Our primary goal is diversification, with the aim of achieving higher returns while effectively managing risks. This transition represents a venture into active investing, presenting an opportunity to experiment with novel strategies, accumulate valuable experience, and observe the outcomes of our dynamic investment approach.

In this study, we will evaluate two options—Hasbro and R.J. Reynolds Tobacco Company—and determine which stock is the optimal addition to our portfolio, providing a detailed rationale for our decision. Our analysis involves scrutinizing five years of historical data for the Vanguard 500 Index Fund, Hasbro, and R.J. Reynolds, focusing on monthly returns.

To provide context for the two companies under consideration, Hasbro, with the NYSE ticker symbol HAS, holds the position of the world's second-largest American toy and game company. Notably, several innovative toys tied to blockbuster franchises like Spider-Man 3 and the action movie Transformers were anticipated to be introduced in the summer of 2007—the very period when Alex is contemplating diversifying his portfolio. This qualitative aspect adds a positive dimension to our investment considerations, as the unveiling of long-awaited products by Hasbro has the potential to drive up the market price of HAS stocks.

Turning our attention to R.J. Reynolds Tobacco Company, listed on the New York Stock Exchange with the ticker symbol RJR, this firm holds the position of being the second-largest tobacco company globally, commanding approximately one-third of the U.S. tobacco market share. Upon thorough examination, it becomes evident that the company grapples with distinctive challenges. Specifically, Reynolds Tobacco Company must adopt an "anti-advertising" stance out of necessity, investing

significant funds to warn prospective consumers about the potential health risks associated with its products.

Furthermore, it is crucial to note that the company has a history of dealing with various litigation scenarios each year over several decades. Despite this, Reynolds Tobacco Company has maintained a positive litigation record. The prospect of potential future litigation cases should be carefully considered in our investment decision-making process, as it could significantly impact the company's expenses, leading to potential losses and affecting its reputation in the fiercely competitive tobacco market.

Our analysis employs a meticulous approach, focusing on calculating risks and returns to compare the risk profiles of Hasbro and Reynolds with the Vanguard 500 Fund. To ensure our new portfolio's expected return adequately compensates for any additional risk, we consider two portfolios: one with 1% Hasbro and the other with 1% Reynolds alongside 99% Vanguard 500 Fund.

Our key metrics for comparison are annualized returns and standard deviation, benchmarked against the Vanguard 500's stand-alone standard deviation. Further, we calculate the beta values for Reynolds and Hasbro relative to the monthly returns of the Vanguard 500. The analysis extends to employing the Capital Asset Pricing Model (CAPM) and Sharpe Ratio to determine the expected rate of return for both companies. Our commitment to clarity includes detailed explanations of these models and concepts, ensuring accessibility for readers without prior financial knowledge.

Analysis

To evaluate the risk associated with each stock, we conducted a detailed analysis of annual returns and standard deviation for the Vanguard 500 Fund, Reynolds stock, and Hasbro stock over a 5-year period. Utilizing Excel formulas (AVERAGE, STDEV) and annualizing outcomes, we obtained the following results:

	Average annual return	Average annual st. deviation
Vanguard 500	6.89%	12.48%
Reynolds	22.50%	32.45%
Hasbro	14.21%	28.11%

Table 1: Average annual returns and standard deviations for each separate stock

Interpreting the data reveals distinct characteristics. Vanguard 500 demonstrates a stable and efficient market outcome with a 6.89% annual expected return. In contrast, Reynolds stock boasts a substantial

22.5% expected return, while Hasbro lags with 14.21%. Assessing standard deviation, a measure of volatility, Vanguard 500 stands at 12.48%, Reynolds at 32.45%, and Hasbro at 28.11%.

The higher standard deviation for Reynolds indicates greater volatility, making it a riskier option compared to Hasbro alone. Investors must weigh the potential for higher returns against the increased volatility, with Hasbro presenting a relatively lower-risk alternative, and Reynolds offering potential for greater returns albeit with higher risk.

Transitioning to the construction of Sharpe's portfolio, comprising 99% Vanguard 500 and 1% of either Reynolds or Hasbro, we generate 60 expected returns over a 5-year period for each portfolio. The subsequent computation allows us to determine the standard deviation of a Vanguard 500-Reynolds portfolio versus a Vanguard 500-Hasbro portfolio. The calculated average annualized standard deviations are 12.45% and 12.53%, respectively. These values suggest similar risk levels between the two portfolios, with slight variations attributable to the inherent volatility of the individual stocks and their correlation with the market.

Comparing these portfolio standard deviations with the stand-alone standard deviation of the Vanguard 500 (12.48%), we find that the addition of Reynolds or Hasbro has not significantly altered the overall risk profile. Notably, Reynolds exhibited a stand-alone risk of 32.45%, and Hasbro had a stand-alone standard deviation of 28.11%. Constructing portfolios with a substantial portion of the market-weighted Vanguard 500 and a smaller portion of the riskier, higher-expected-return stocks resulted in portfolios with higher average annual returns and reduced dispersion.

Graph 1 illustrates a visual representation of the average annual returns and standard deviations.
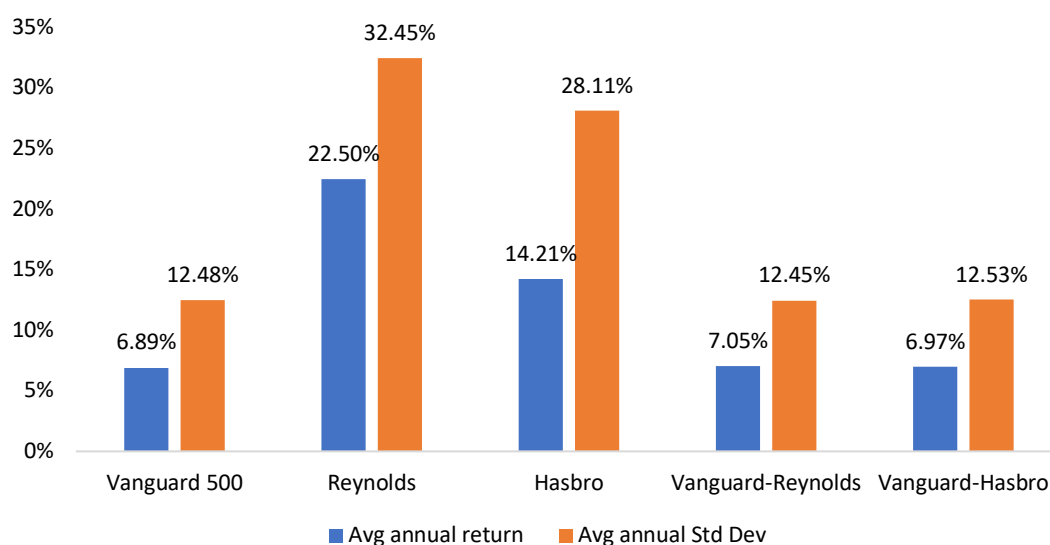
Graph 1: Average annual returns and standard deviations

In summary, the Vanguard-Reynolds portfolio offers favorable outcomes with higher returns (7.05%) and lower standard deviation (12.45%) compared to both the Vanguard 500 alone and the Vanguard-Hasbro portfolio.

Continuing our portfolio analysis, we calculate the beta for Reynolds and Hasbro by comparing their monthly returns to those of the Vanguard 500. By creating scatter plots with Vanguard 500 monthly returns on the x-axis and Reynolds or Hasbro on the y-axis, we derive beta values. For Reynolds, the beta is 0.7358, and for Hasbro, it is 1.4198, as illustrated in Graphs 2 and 3.
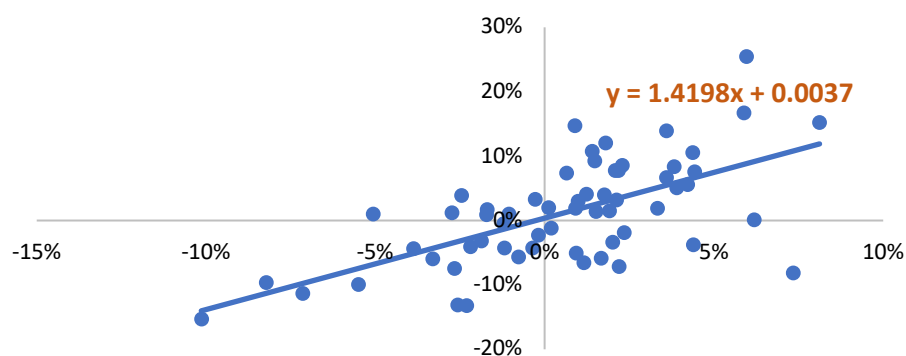
Graph 2: Hasbro per Vanguard 500
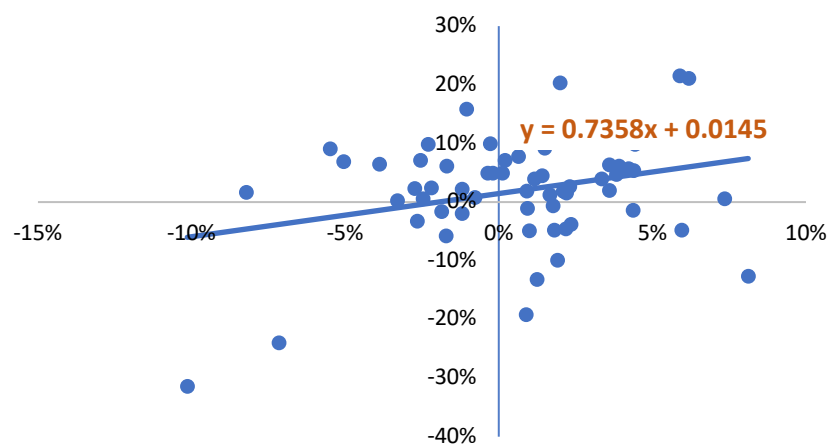
Graph 3: Reynold per Vanguard 500

Beta serves as a gauge for a stock's volatility concerning the broader market, represented by the Vanguard 500. A beta below one, as observed with Reynolds (0.7358), indicates lower volatility than

the market, suggesting stability with smaller price fluctuations. Conversely, Hasbro's beta exceeding one (1.4198) implies higher volatility, indicating more significant price movements compared to the overall market. It's essential to note that beta is a historical measure and may not precisely predict future volatility. Additionally, beta doesn't provide information about the direction of stock movement; it only indicates the stock's volatility relative to the market.

These findings align with our previous standard deviation analysis of the Vanguard 500-Reynolds and Vanguard 500-Hasbro portfolios. Vanguard 500-Hasbro exhibited higher volatility, correlating with a higher standard deviation and implying potentially more dispersed and riskier expected returns than the mean value.

The lower beta for Reynolds (0.7358) corroborates its lower volatility, consistent with the standard deviation analysis. Conversely, the higher beta for Hasbro (1.4198) supports its slightly higher volatility, aligning with the standard deviation results. This alignment between beta and standard deviation reinforces the reliability of our risk assessment.

Utilizing the Capital Asset Pricing Model (CAPM) to determine the required rate of return, we calculated an expected return of 5.6% for Reynolds and 8.94% for Hasbro. These figures represent the anticipated returns that investors would expect for holding each respective stock, factoring in their systematic risk in relation to the market and the updated market risk.

When comparing the two stocks, Hasbro emerges as the more favorable option due to its higher expected return and lower standard deviation, resulting in a notably superior Sharpe Ratio compared to Reynolds. Reynolds has a Sharpe Ratio of 0.1109, indicating a relatively modest excess return over the risk-free rate for each unit of risk. In contrast, Hasbro's higher Sharpe Ratio of 0.2470 suggests a more attractive risk-adjusted return, reflecting a better balance between risk and return. Based solely on the Sharpe Ratio, Hasbro appears to offer a more advantageous risk-adjusted return.

Sharpe Ratio			
	Exp Rtrn	Risk-Free	Std Dev	Sharpe Ratio
Reynold	5.60%	2.00%	32.45%	0.1109
Hasbro	8.94%	2.00%	28.11%	0.2470

Table 2: Sharpe Ratio

Conclusion
Given Alex's conservative approach and the desire to move from passive to active investing, it's crucial to balance risk and return. The Vanguard 500 Fund, being a market-weighted index fund,

provides a stable and diversified foundation. However, to introduce an active element, allocating a small percentage (1%) of the portfolio to a specific stock is a reasonable approach.

Comparing Reynolds and Hasbro, both offer unique characteristics. Reynolds, with a lower standard deviation and beta, suggests lower volatility and risk compared to Hasbro. On the other hand, Hasbro exhibits higher expected returns and a slightly higher level of risk.

Considering Alex's conservative stance, the recommendation would lean towards Reynolds. The Vanguard-Reynolds portfolio has shown favorable outcomes with higher returns and lower standard deviation, aligning with Alex's preference for a more stable and less volatile investment. This choice allows Alex to introduce an active element into her portfolio while maintaining a conservative approach.

In summary, for Alex Sharpe's transition to active investing with a conservative start, allocating 1% of her portfolio to Reynolds appears to be a prudent choice, aligning with her risk tolerance and investment objectives.