Business Forecasting

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| **SL. NO.** | **Roll No** | **Full Name** | **Academic Group** |
| 1 | 2023JULB01063 | Abhishek Padhy | 3 |
| 2 | 2023JULB01034 | Karthik Siva |
| 3 | 2023JULB01339 | Sweety Singh |
| 4 | 2023JULB01077 | Shailendra Yadav |
| 5 | 2023JULB01302 | Hemalatha S |

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| 1. **What did Alex Sharpe learn about making investments during her MBA program?**   During her MBA program, Sharpe had learned that in an efficient market, investors should buy and hold the ‘market portfolio’ as it was seen that no other portfolio can offer the same expected return at a lower risk. |
| 1. **What did Alex Sharpe do with her children's educational savings? Why**?   Alex Sharpe had invested her children’s educational savings in the Vanguard 500 Index Fund, a no-load mutual fund constructed to track the performance of the S & P 500. **which is a commonly used benchmark for the overall U.S. stock market.**  She made this investment decision based on her understanding, gained during her MBA program, that in an efficient market, investors should opt for the 'market portfolio' because it offers the same expected return as other portfolios but at lower risk. Given that the S&P 500 is a representation of the broader market, Sharpe chose the Vanguard 500 Index Fund to provide her children with exposure to a broad market index without having to invest in individual stocks.  The decision aligns with a passive investment strategy, reflecting her belief in the efficient market hypothesis and the advantages of low-cost index funds for long-term investors. This strategy is intended to capitalize on market returns without actively managing the portfolio.   1. **Which is the most commonly used benchmark for the stock market in the United States? Describe it's construction.**   The Standard and Poor’s (S&P) 500 was the most commonly used benchmark for the overall U.S. stock market. The S & P 500 index consists of 500 stocks chosen for market size, liquidity and industry grouping, among other factors. This index is meant to reflect the risk/return characteristics of large-cap stocks. The S & P 500 is a market value-weighted index, i.e., each stock’s weight in the index is proportionate to its market value.   1. **What changes does Alex Sharpe want to make to her investment strategy? Why?**   In order to achieve higher returns, Sharpe had been changing her passive investment strategy to one that was more active. She wanted begin conservatively by adding carefully chosen stocks to her current equity portfolio. |

**5. Which are the companies that she has shortlisted for her new investment strategy?**

The companies that Alex Sharpe has shortlisted for her new investment strategy are Hasbro (NYSE: HAS) and R.J. Reynolds Tobacco Company (NYSE:RAI). These companies are being considered for inclusion in her portfolio as part of a shift from her current passive investment strategy to a more active approach.

**6. What kind of analysis does Alex want to do before deciding on her new investment strategy? What is the information she is looking at for this purpose?**

Before taking over a new investment strategy Alex wants to compare the returns on the individual components of her portfolio. She also wants to compare the risk profiles of the two companies with respect to Vanguard Fund. To analyse a new investment strategy for return purpose she will have to take **average of annualized returns** of three variables and combination of those variable in her portfolio and for the risk purpose she will have to take **annualized SD of** three variables and combination of those variable in her portfolio.

**7. What is the dataset that Alex is analysing to make an informed decision? What are the variables in the dataset? How many observations are there?**

**Dataset:** last five years of monthly returns for the vanguard 500 index fund HASBRO, R.J. REYNOLDS

**Variables:** SP500, HASBRO, R.J. REYNOLDS

**Observation:**180(excluding dates)

**8. What according to you is the specific question that Alex's is trying to answer? State it within 4 to 5 lines.**

She wanted to ensure that the expected return of her new portfolio would provide adequate compensation for taking on any new risky assets.

**9. Should Alex Sharpe add the two individual stocks she is considering to her existing portfolio of the Vanguard 500 Index Fund?**

This question requires Alex to weigh the potential benefits of higher returns from individual stocks against the increased risk of portfolio volatility. By analysing the historical return data of the S&P 500, the individual stocks, and the potential new portfolio combinations, Alex can make an informed decision about the optimal risk-return trade-off for her investment goals.

**10. Compare the dataset shared with the data in Exhibit 1 in the case. Is there any difference?**

Yes, the dates are same and the investment return data of SP500, REYNOLDS AND HASBRO are different.

**Question 13:**

**Based on the updated Table 1, which stock appears to be the riskiest?**

The higher the annualized standard deviation, the higher the volatility, so the risk will be higher where the annualized SD is high.

* SP500: Annualized SD = 12.3578
* Reynolds: Annualized SD = 32.3398
* Hasbro: Annualized SD = 28.0365

So, Reynolds has a higher risk.

**Question 14:**

Create different portfolio combinations as below:

99% SP 500

99% SP 500 and 1% Reynolds

99% SP 500 and 1% Reynolds

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| **Table 1** |  |  |  |
| **Metric** | **SP500** | **Reynolds** | **Hasbro** |
| Monthly returns | 0.55 | 1.88 | 1.23 |
| Annualized returns | 6.60 | 22.60 | 14.80 |
| Monthly SD | 3.57 | 9.34 | 8.09 |
| Annualized SD | 12.40 | 32.30 | 28.00 |

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| **Table 2** |  |  |  |
|  | **SP500 + Cash** | **SP500 + Reynolds** | **SP500 + Hasbro** |
| Annualized SD | 12.23 | 12.32 | 12.41 |

Here, three different portfolio combinations are being created based on the weights assigned to three assets (SP500, Reynolds, Hasbro):

The variables that have been created are as follows:

* **SP500andCash**: A portfolio with 99% invested in SP500 and 1% in cash (essentially excluding Reynolds and Hasbro from the portfolio).
* **SP500andRey**: A portfolio with 99% invested in SP500 and 1% in Reynolds.
* **SP500andHasbro**: A portfolio with 99% invested in SP500 and 1% in Hasbro.

**Question 15:**

**How is the risk associated with these new portfolios.**

**Calculate the annualized SD using the formula above for these 3 combinations created in 14 to answer this question.**

Annualized SD of SP500+HASBRO (12.41) > SP500+REYNOLDS (12.32) > SP500+CASH(12.23).So the risk is higher in SP500+HASBRO > SP500+REYNOLDS > SP500+CASH. Therefore, SP500 + Hasbro is considered the riskiest asset among the three, while SP500 + Cash is considered the least risky.

**Question 16:**

Compare your answer in 15 with the answer in 13. What is your observation?

**Answer:**

The portfolio combinations with additional assets (SP500 + Cash, SP500 + Reynolds, SP500 + Hasbro) have annualized standard deviations that are relatively close to each other and generally lower than the individual annualized standard deviations of Reynolds and Hasbro

So, combining different assets in a portfolio can help lower the overall risk of your investments compared to putting all your money into just one or two assets that might be more volatile.

**Question19:**

**What does the beta of each regression tell you?**

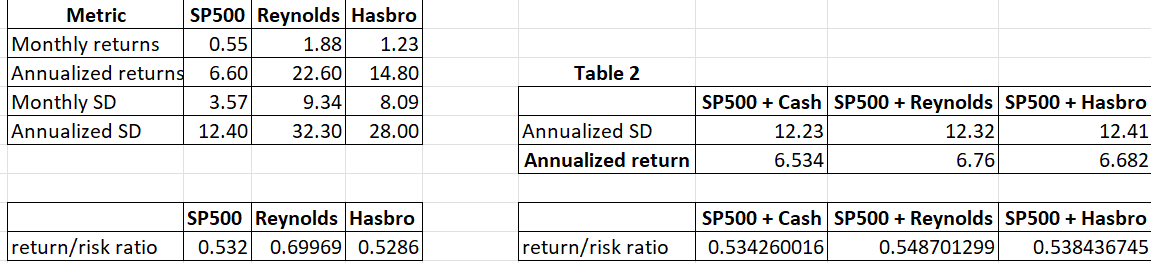
**SP500 ON REYNOLDS:**

For every 1 % change in SP500 returns, Reynolds returns are expected to increase by 7.63%, and thus it will increase my portfolio returns.

**SP500 ON HASBRO:**

For every 1 % change in SP500 returns, HASBRO returns are expected to increase by 1.44%

**20. Using all the above information - which stock(s) according to you should Alex invest in? What should her portfolio consist of? What recommendation do you give?**



As per return/risk ratio, if she chooses individual stocks then REYNOLDS will give more than return (6.9%) when compared to SP 500(5.32%) AND HASBRO (5.28%).

For combination of stocks ,if she chooses SP500+REYNOLDS ,her returns will be 5.48% which is greater than SP500+CASH(5.34%) AND SP500+HASBRO(5.38%).

I would recommend her to go for diversifying her portfolio with less risk and high returns by SP500+REYNOLDS.