Final Report Investment Challenge - Group 5

BUSI4502-Portfolio Management

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Trading highlights and History

During the holding period of our portfolio we have made trades that we will highlight throughout this section, these trades were crucial to the success of our portfolios. We have broken down our holdings and highlights into two portfolios, D and I. Portfolio "D" is our market diversified portfolio, while "I" is our industry specific portfolio. Beginning with our diversified portfolio (D) we submitted the buy order for ABBV (AbbVie Inc.) at the price of $145.93 on 01/30/2023 the purchase was for 55 shares with a total purchase price of $10,679.80. This trade was very important to the performance of our portfolio as during the tenure in which we held ABBV we realized 6.7% on that stock. This was as well the initial trade we made in the industry specific portfolio, 55 shares of ABBV were purchased on 01/30/2023 at a share price of $145.76 totalling $10,667.35 for the healthcare industry specific portfolio. Following our trend of investing in healthcare our next monumental position was in LLY (Eli Lilly and Company) in the industry portfolio. We took a large position in LLY as we purchased 100 shares on 03/08/2023 at a share price of $310.13 to total $42,648.30 this created our largest open position we held in our industry specific healthcare fund. Looking back to the diversified portfolio, the next two purchases we want to highlight are (The Procter & Gamble Company) and KO (Coca-Cola), both of these trades were very profitable for our portfolio even when the market was showing negative returns. On 01/30/2023 we submitted the buy order for PG for 50 shares at $140.56 for a total of $ 9,351.63 this trade provided our portfolio with returns of 5.78%. Finally we purchased KO (Coca-Cola). This stock is the preferred holding of our portfolio, for multiple reasons described in our SAV analysis report (See appendix) the holding of KO has made great returns for our portfolio, has paid dividends, and served as a low volatile stock in our holdings throughout very volatile markets. We purchased KO on 02/09/2023 for the share price of $59.73 we purchased 50 shares in total which gave the total purchase amount of $4,015.63.

Investment Strategy

For the Portfolio I segment of this project, we have chosen to target the Health sector, which has demonstrated remarkable stability throughout our investment timeline. This decision was made after analyzing the performance of individual sectors against the market. Our strategy involves limited active trading, focusing primarily on holding positions. As we were restricted to 35 trades in this portfolio, we had allocated our $400k required investment across nine securities. This allocation allows for flexibility in case we identified new opportunities within the sector or needed to replace any holdings based on news updates.

Our primary focus was on product innovation within the healthcare industry, as it is continuously evolving, and companies with pioneering technologies or treatments can offer substantial growth potential. We sought out firms developing novel drugs, medical devices, or therapies that could transform healthcare. Additionally, we would monitor regulatory changes that may adversely affect a company's product, as the healthcare sector is heavily regulated, and such changes can impact profitability. We intended to keep an eye on regulatory developments and their potential impact on our investments.

Portfolio D, which we have created, consists of companies from Energy, Utilities, Consumer Staples and Discretionary, Financials, and Healthcare sectors. These companies were expected to deliver revenue growth while offering stability in volatile markets. Our selection's focus was on short-term growth, aligning with our active trading strategy to maximize returns in our diversified portfolio. Given our three-month trading timeline, we had opted for active trading, leveraging earnings dates to our advantage. We have observed that the market often reacts dramatically to earnings announcements, with stock prices temporarily dropping before returning to reasonable levels.

We also prioritized dividend dates, particularly in the Energy and Utilities sectors, which have experienced significant volatility due to ongoing global political issues. We anticipated that these sectors, especially Energy, will see the most active trading, as their volatility presents opportunities for short-term entry and exit strategies.

Although we initially adhered to our strategy, we became less active in trading towards the end of the investment period. Furthermore, our earnings date strategy did not yield the same level of success as it did with Snapchat in the previous semester. We believe this was primarily due to the market's reaction to other factors, such as interest rates, inflation, and bank runs, which overshadowed the impact of earnings announcements.

These external elements influenced market sentiment and behavior, causing a shift in focus away from earnings results. Consequently, our strategy's effectiveness was reduced, highlighting the importance of adapting to changing market conditions and remaining flexible in our approach. Despite these challenges, the experience has provided valuable insights that can inform our future investment strategies and help us better navigate a dynamic market landscape.

Portfolio D & I Analysis

To reduce risk as an investor, it is critical to diversify your investments across industries. We engaged in six distinct industries for Portfolio D, according to StockTrak. Finance, Retail Trade, Health Services, Health Technology, Consumer Non-Durables, and Energy Minerals are among these businesses. The health sector accounts for 33.8% of our portfolio, making it the largest element of our portfolio. As previously said, we believed that the health industry would profit from growing innovation and technology and that it is a stable investment throughout the time of the portfolio. The Retail Trade industry accounts for the smallest percentage of our portfolio, accounting for approximately 2.6%. This is due to the fact that we only own one company in this industry, Costco. Other than Finance, which accounts for 20.1% of our portfolio, the rest of our portfolio is fairly evenly spread among the other sectors.

Based on the recent performance of health technology and health services companies, we saw growth potential in the health industry, with this industry accounting for more than 30% of our portfolio, with a nearly 50/50 split between Health Technology and Health Services. With Health Technology providing a much higher return than Health Services due to overall innovation, growth, and market stability. In the finance industry, we purchased C, RY, TD, and SCHW with the goal of ensuring stable revenue streams and stability. However, the collapse of Silicon Valley Bank did not work in our favor, resulting in a -13.87% overall negative return. In terms of retail trade, we acquired Costco due to its large market size and high customer spending. We only owned one business in this sector because of the volatility, and as a result, we had a negative return of 1.23%. We recognised a lot of promise in consumer non-durables due to solid demand and reliable revenue streams, so we bought a few companies in this industry, including KO, NKE, and NSRGY. This market was pretty constant throughout the holdings, providing a 0.73% overall positive return. Finally, we purchased CVX, IMO, ENB, and XOM in the energy and minerals sector in the expectation that natural resource demand would allow for a strong return on this portion of the portfolio. However, due to the sector's uncertainty and volatility, it did not produce a positive return for this portfolio, with a negative 5.19% average return

Portfolio I was diversified across several sectors of healthcare such as pharmaceuticals, healthcare services, medical equipment and utilities, and healthcare insurance/benefits, which was critical to developing a portfolio in one specific industry. We purchased ABBV, LLY, MRK, and NVO in the pharmaceuticals sector while considering growth, innovation, long-term stability, and diversity. Overall, the pharmaceutical firms performed relatively well for the portfolio, with an average return of 6.40% across the four companies. In the healthcare services market, we purchased TDOC with the expectation of development due to the increased use of virtual medical services and telehealth, however this resulted in a -2.20% return. In terms of the medical devices and utilities market, we purchased SMMNY with the developing industry, innovation, and potential for societal impact in mind, which resulted in a 6.74% positive return. Finally, in the healthcare insurance/benefits market, we opted to purchase UNH, CNC, and CI due to expanding demand and stable revenue streams; nevertheless, because of the highly regulated environment, the overall return for the portfolio was a negative -5.41%.

The industry chosen for our favorite industry of the market was the Health sector because it has demonstrated exceptional stability over the course of our investments. To begin, Artificial Intelligence in Healthcare, specifically machine learning, inspired our team's decision to select the health sector in 2023. There are several deeply implanted AI-aligned technologies in the healthcare industry, such as computer vision, natural language processing, and others, that will continue to be embraced as their utility improves during 2023 (*Home*, n.d.). As a result, we predicted that AI and machine learning would remain a dominant trend in healthcare throughout the year. Another development that influenced our judgements was the rise of virtual hospitals, healthcare communities, and telehealth since the pandemic. Although it is now safe to meet in a doctor's office, with the cost of providing in-person healthcare continuing to rise and ongoing shortages of medical practitioners in many countries, it was a safe bet that all forms of remote healthcare would be a growing trend in 2023 (*Home*, n.d.). As a result, we recognised an opportunity to invest in companies that provide similar services, such as Teladoc Health, which offers services such as telehealth. Overall, we saw a lot of potential in the healthcare industry, as described in the investment strategy, because it is continually growing and contains a lot of innovative companies with breakthrough technologies or therapies that can give considerable growth opportunities. However, within the industry, there are also risks that may come or could cause harm to the company, a product of a company, or the future of a company's product. During the buy/hold period, it was important to pay attention to the industry regulations as the health sector is highly regulated and changes in regulations can impact the profitability of a company and affect the investments we were holding.

Portfolio I Performance

To calculate the measures of performance for this portfolio, we need to first calculate the total value of the portfolio, which is the sum of the market values of all the holdings:

Total Portfolio Value = $46,346.23 + $43,203.73 + $45,313.86 + $46,450.99 + $43,170.93 + $53,813.19 + $31,109.80 + $47,293.66 + $48,581.12 = $405,474.51

Next, we can calculate the portfolio return, which is given in by Stock Trak. Portfolio I return is -0.34%.

The next measure of performance we can calculate is the portfolio beta, which measures the sensitivity of the portfolio's returns to changes in the overall market:

Portfolio I Beta = Sum of (Beta of Holding x Market Value of Holding) / Total Portfolio Value

We get the Beta of each stock from yahoo Finance.

Using the betas of the individual holdings from Yahoo Finance:

Portfolio Beta = Sum of (Beta of Holding x Market Value of Holding) / Total Portfolio Value

STOCK Symbol	Beta
ABBV	0.59
CI	0.68
CNC	0.56
LLY	0.35
MRK	0.35
NVO	0.31
SMMNY	0.61
TDOC	1.08
UNH	0.69

Portfolio Beta = (0.59 x $46,346.23 + 0.68 x $43,203.73 + 0.56 x $45,313.86 + 0.35 x $46,450.99 + 0.35 x $43,170.93 + 0.31 x $53,813.19 + 0.61 x $31,109.80 + 1.08 x $47,293.66 + 0.69 x $48,581.12) / $405,474.51= 0.61

Treynor Ratio = (Portfolio Return - Risk-Free Rate) / Portfolio Beta

Assuming a risk-free rate of 0.75%, the Treynor ratio for this portfolio is:

Treynor Ratio = (-0.0034 – 0.0075) / 0.61 = -1.79%

Therefore, the measures of performance for this portfolio I with a return of -0.34% are:

Portfolio return: -0.34%

Portfolio beta: 0.61

Treynor ratio: -1.79%

The portfolio I return indicates the percentage gain or loss of the portfolio over a specific period. In this case, the portfolio has a negative return of -0.34%, indicating that portfolio I has lost value during the holding period. Comparing the portfolio's measures of performance to those of the DJIA (Dow Jones Industrial Average) can provide additional insights into the portfolio's performance. The DJIA's return of -2.242% is lower than the portfolio's return of -0.34%. This suggests that portfolio I has outperformed the DJIA over the holding period.

Portfolio beta measures the systematic risk of the portfolio relative to the overall market. A beta of 1 indicates that the portfolio moves in tandem with the market, while a beta of less than 1 indicates that the portfolio is less volatile than the market. In this case, the portfolio I beta is 0.61, indicating that the portfolio is less volatile than the overall market.

The Treynor ratio of -1.79% suggests that the portfolio's returns have not compensated investors for the risk taken. The negative Treynor ratio indicates that the portfolio has underperformed compared to the risk-free rate of return, adjusted for the portfolio's level of risk. The DJIA's Treynor ratio of -2.992% is also lower than the portfolio's Treynor ratio of -1.79%. This indicates that the portfolio has performed better than the DJIA on a risk-adjusted basis. Overall, the portfolio's performance seems to be unsatisfactory given the negative return and negative Treynor ratio. However, it is worth noting that the beta of the portfolio is less than 1, suggesting that the portfolio is less risky than the market as a whole. This could be seen as a strength of the portfolio's risk profile. On the other hand, the negative Treynor ratio could be seen as a weakness, indicating that the portfolio has not provided a satisfactory risk-adjusted return.

Concluding performance, while the portfolio's risk level appears to be relatively low, its performance has not been able to compensate investors for the level of risk taken. This could suggest that the portfolio's investment strategy may need to be re-evaluated to achieve better risk-adjusted returns in the future.

Portfolio D Performance:

Market value of portfolio D= portfolio value – cash balance = 316, 130,

Our Diversified portfolio had a holding period return of -2.17% given by stocktrak.

Additionally, we used a weighted Beta approach to calculate the beta of the portfolio by using the (5 year monthly) Beta data from Yahoo finance and portfolio composition with following betas and weights in the portfolio: beta portfolio= sum(weight i * Beta i) = .78

BETA	Weight	SYMBOL
1.56	4.01%	C
0.18	0.95%	BIIB
1.38	4.28%	BAC
0.64	1.55%	AMGN
0.63	10.93%	CI
0.56	1.49%	CNC
0.79	5.31%	COST
1.16	4.60%	CVX
0.88	1.52%	ENB
1.90	3.04%	IMO
0.53	2.98%	JNJ
0.55	1.33%	KO
0.36	11.46%	LLY
1.11	6.82%	NKE
0.72	4.43%	NSRGY
0.74	6.01%	RY
0.84	3.84%	TD
1.07	3.05%	XOM
0.68	1.21%	UNH
0.88	1.68%	SCHW
0.39	3.18%	PG
0.55	16.37%	ABBV

Treynor Ratio = (Portfolio Return - Risk-Free Rate) / Portfolio Beta

Treynor ratio = (-2.17% - .0075) / .78 = -3.72%

We used the 3 month t-bill rate of =4.5% * 2/12 = .0075. On a risk adjusted basis; we had a Treynor ratio of -3.724%. A negative Treynor ratio indicates that the portfolio has underperformed the risk-free rate, relative to the level of systematic risk (beta).

Therefore, the measures of performance for this portfolio I with a return of -2.17% are:

Portfolio return: -2.17%

Portfolio beta: 0.78

Treynor ratio: -3.72%

Portfolio D's return of -2.17% indicates that the portfolio lost value during the holding period. In comparison to DJIA return of -2.23%,captured through calculating the daily returns of the index using data from Yahoo finance our portfolio outperformed the market index in this measure.

Our beta of .78 is lower than the market index of 1 which is an indicator of a lower expected volatility in our portfolio than the general market index and lower exposure to the systemic risk making it more suitable for risk averse investors.

Treynor Ratio of -3.724% suggests that investors were not compensated properly for the risk taken. In comparison to the treynor ratio of -2.99% of DJIA over the same period, we can conclude that DJIA outperformed portfolio D, likely due to our higher exposure to the turmoil in the financial sector.

Complete Portfolio:

To measure the returns of the complete portfolio, we used the returns of each portfolio times the weight of them:

Portfolio C return= weight D * return D + weight I * return I

Return C= 0.44* -2.17% + .56* -0.34% = -1.14%

To calculate the Beta we used the same approach:

beta= portfolio D beta * weight of D + portfolio I beta * weight of I

beta = .44* .78 + .56*.66 = 0.67

To calculate the Treynor ratio we can use the calculated inputs to get the Treynor ratio of -2.83%.

Treynor ratio = (Portfolio Return - Risk-Free Rate) / Portfolio Beta

= (-1.14% - 0.0075) / 0.67 = 2.83%

Our overall portfolio return of -1.14% means that the portfolio has lost money in the investment period. This is not aligned with our objective of exceeding the returns of the risk free investment in portfolio D, however in the case of portfolio I which had a goal of capital preservation in the time of market downturn, this return could be deemed acceptable. In comparison to the return of DJIA, the market index used, our portfolio lost 1.1 % less money in the same period.

Portfolio beta used as the measure of the exposure to the systematic risk of the portfolio to the overall market was calculated to be 0.69 which is lower than the market beta of 1. and due to the current uncertainty we chose more defensive stocks observable by our low beta.

Given our short holding period, the market conditions in which we are operating has a large influence on investment outcomes so we used treynor ratio to account for systemic risk. Overall, our portfolios had a combined treynor ratio of -2.83% which while outperforming the DJIA’s ratio of -2.99, is still undesirable since negative treynor ratio means that the investor was better off investing in the risk free asset.

Conclusion

In conclusion, our investment journey in both Portfolio D and I has been a valuable learning experience. We made key trades that contributed to the overall performance of our portfolios, and we gained a deeper understanding of the importance of diversification and risk management. Our strategy of focusing on the healthcare sector in Portfolio I proved beneficial in terms of stability, as the sector demonstrated remarkable resilience throughout the investment period.

Despite facing challenges such as market volatility, changes in interest rates, inflation, and bank runs, our portfolios managed to perform relatively well compared to the broader market indices. Our ability to adapt to changing market conditions and remain flexible in our approach was crucial to navigating these challenges.

However, there is always room for improvement. Our negative return and negative Treynor ratio in Portfolio I suggest that we need to re-evaluate our investment strategy to achieve better risk-adjusted returns in the future. This experience has provided us with valuable insights that will inform our future investment strategies and help us better navigate the dynamic market landscape.

Moving forward, we will continue to monitor industry trends, regulatory changes, and global events to make informed investment decisions. We will also be more proactive in adjusting our strategy as needed to respond to market fluctuations and capitalize on emerging opportunities. By learning from our past experiences and remaining adaptable, we are confident in our ability to navigate the complex world of investing and achieve success in the future.

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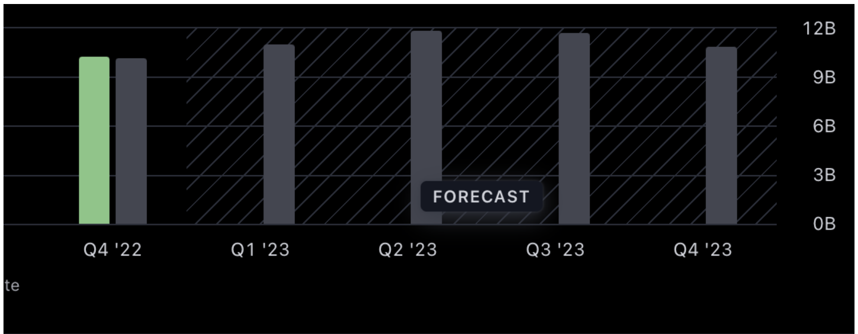
Appendix

SAV of Favorite Stock- Coca-Cola (KO)

Coca-Cola (ticker:KO) is the preferred stock in our portfolio. During our first SAV reports we highlighted why we chose Coke, some determinants of our valuation and did a deep dive into the debt ratios and management structure. Our decision to have Coke as our favorite stock has not changed throughout the portfolio holding period. In this report we will discuss the determinants to why Coca-Cola is our preferred stock, its performance in our portfolio, and some notable events that have occurred during the duration of our portfolio holding. We have chosen KO to be our preferred stock for many different reasons. Due to its strong revenue projections and long term history of resilience we believe holding Coca-Cola gives our portfolio a strong bedrock to build gains while maintaining low volatility. Coca-Cola has shown a great revenue increase in 2022, with a net revenue growth of 10% ($11.1 Billion). On February 14th Coke announced earnings of 10.1B for Q4 of 2022 (Appendix A), this was a positive mark for earrings although this was less than Q3 of 2022 with the state of the markets in Q3 and Q4 2022 this was a positive to shareholders as it was over expected earnings. Coca-Cola is a vast owner in the beverage industry with ownership of brands such as Sprite, Vitamin water, Dr. Pepper, and more. A risk we have identified with KO is their high levels of debt, although the current debt to equity ratio of Coca-Cola sits at 168.57%, (Debt:$41.191, Equity:$24.436), they have been actively reducing their debt over the past five years using their operating cash flow which is up 27.8% Overall the history of performance and management structure make KO a cornerstone of our portfolio.

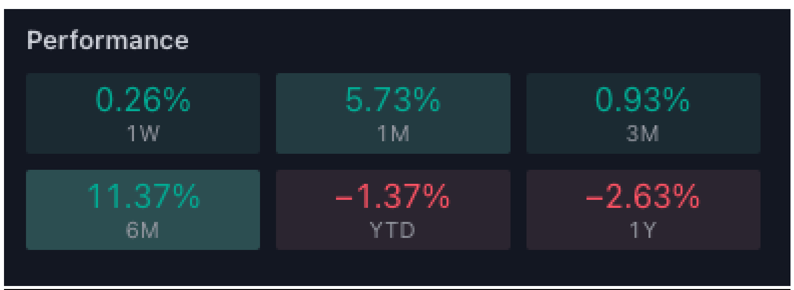
Moving on to the performance aspect of Coca-Cola, Since our last report on March 9th KO has a one month return of 5.73% (Appendix B) this has been a very nice reversal since our last one month returns were -0.22%. Coke is a very valuable for its resistance to volatility and performance when markets rebound, in our last report we showed how Coke had -0.22% returns but in comparison to the Consumer Discretionary sector -7.3% and the S&P 500 -4.56% the returns of coke have been favorable in the volatile state of the markets. Coke as well does great when the markets perform, current returns this month for KO are 5% while the Consumer Discretionary sector is 5.19%. This performance is crucial to our investors and makes KO a long term hold for our portfolio. On March 16 we received the dividends from Q1, having Coke being an income providing stock while maintaining its returns is a large factor into why we have chosen it for our favorite stock. With a long history of steady earrings growth it makes it a preferable stock to own in uncertain times.

Looking back at our last report we will highlight some of the strengths Coke presents to our portfolio and why we have chosen it as a preferred stock. Coca-Cola has shown a great revenue increase in 2022, with a net revenue growth of 10% ($11.1 Billion). Some notable events in recent history with Coke are that they have recently announced their full sponsorship of the 2023 Summer Olympics, which will be held in Germany. This provided additional exposure to the brand internationally. Another notable announcement is the cross over collaboration Coke has done with Jack Daniels, they have announced a ready to drink cocktail made with Coca-Cola and Jack Daniels. They will be introduced to markets in the US this year and will have additional options such as zero sugar. Relative to the beverage industry, Coca-Cola dominates the industry. Coca-Cola is a global leader in the beverage industry and has maintained its market share by utilizing a variety of marketing techniques. Over the years, Coca-Cola has developed a strong brand reputation and has become universally known as the definition of soft drinks. Our investment policy focuses on investing in companies that can generate income and returns while maintaining low volatility. The current market outlook and sentiment is poor, with many people fearing a recession. In this case Coke fits out portfolio investment policy and strategy very well. Our goal with Coke is to hold it for income generation, for its strong revenue growth and because historically it does well in volatile markets.



Q3 '22	Q4 '22	Q1 '23	Q2 '23	Q3 '23	Q4 '23
11.06B	10.10B	—	—	—	—
10.52B	10.00B	10.83B	11.72B	11.63B	10.73B
+5.16%	+0.97%	—	—	—	—

(Appendix A, KO Earnings report Q4' 22)



(Appendix B, KO 1 Month return)