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AF5365 APPLICATIONS OF COMPUTING AND TECHNOLOGY IN ACCOUNTING AND FINANCE I

Project Report of Group 5

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Introduction

Background and Macroeconomics

Regarding the global economics events in 2022s:

1. Russo-Ukrainian War, it is leading the energy price high standing such as oil price and gas price.
2. COVID-19 pandemic, it affects the economics activities in every country
3. Higher Inflation in many countries, GDP continually dropping down like U.S. GDP Annual Growth Rate dropping
4. U.S. Federal Funds rate rising, it is leading the US 10 Years Treasury Rate rising, U.S. dollars Index rising, it makes the market unstable.

Ukraine and Russia major exporters of agricultural food and important materials for semiconductors, and armaments and raw materials such as oil and natural gas, respectively, disturbed the supply and demand balance of the industrial chain, and the width of the offer fluctuated.

As the war escalates, the political and economic and trade sanctions coming, the economic base entering a cycle of rising interest rates, exacerbate inflation again. Global funds turn conservative to the stock market, taking a short-term and flexible attack on crude oil and raw materials with imbalanced supply and demand, and risk-averse gold and bonds.

Project Objective

The objective of this project is to construct a diversified portfolio by selecting 4 stocks from Dow Jones Industrial Average (DJIA) and to compare their performance with the market. Then to evaluate the risk and return of our constructed portfolio. Last but the least, to access what attributes or factors make a portfolio outperform the market.

To have a diversified portfolio, our group selected the below four companies from different industries. Chevron (CVX) from Oil & gas, Procter & Gamble (PG) from Household products, Coca-Cola (KO) from the Beverages industry and JP Morgan (JPM) from Financial services.

Part 1 Portfolio Performance

1.1 Selecting 4 Firms for portfolio

1.1.1 Introduction of 4 Firms

Chevron, US based, the 2nd largest company in the Oil & Gas industry with market cap of $354 billion. They deliver energy worldwide. Their operations cover, not limited to oil production, refining, supply and trading. Moreover, they also own one of the world's largest natural gas projects which to power the Asia Pacific Region.

Procter & Gamble which also known as P&G, the company with the highest market cap within the industry - $340 billion. They have 10 categories with over 60 brands with products cover from baby care to home care products. For 2022, they attained a 7% organic sale growth. Basically, you can find their brand in every household.

Coca-Cola, the top stock under the non-alcoholic beverage industry, with a market cap of $264 billion. The portfolio includes a wide range of beverage products, from water to energy drinks. They are now investing in healthier alternatives like teas, sparkling water and sport drinks. Their products are offered in more than 200 countries and territories.

JP Morgan, a firm offering Financial Service, is the largest firm under Major Regional Bank with $392 billion. JP Morgan is the leader in investment banking, commercial banking, transaction processing and asset management in over 100 countries.

1.1.2 Reason for 4 selected firms

As we mentioned above, a portfolio should achieve better risk/reward by selecting firms with varying backgrounds. Especially during economic turbulence, firms' stock prices fluctuated and become difficult to predict.

The first principle of our selection is that the companies need to be in different industries to mitigate the risk. These companies should also be the leaders in their industries, so that they would be suitable representatives. Energy companies, which we chose Chevron reacted in a better way to the recovery of COVID. Energy demand rose as economic activities resumed to a higher level. P&G and Coca Cola are consumer goods corporations, and this industry has taken a hit from the Federal Reserve’s interest rate increase. JP Morgan, as a financial services company, was the most susceptible to interest rate increases. All four firms experienced a hit in early 2020 when COVID started. However, the firms recovered at different speeds and responded differently to the Fed's interest rate increase. Thus, it mitigates the risk of the portfolio from market impact.

The second principle is that we wanted to include firms with varied sizes and financial performance. Some of the companies we chose had strong financial health and their ratios were attractive to investors. These companies have a higher chance of being overvalued, and therefore could be riskier to economic difficulties. We also include companies with less attractive financial ratios. Their prices were also lower and had less risk of being overvalued. The firms we chose have varying Price/Earnings ratios, ranging from 0 to 25. By selecting firms with diversifying backgrounds, our portfolio could be less susceptible to economic turbulence and have a higher chance of outperforming the market.

1.2 Evaluation

Our portfolios were compared to the DJIA portfolio to evaluate the effectiveness of our portfolio with data ranged from 1st Jan 2022 to 31st Oct 2022. The 4 stocks selected in our portfolio are in equal weighting while the DJIA portfolio followed its official weighting. Both portfolios were evaluated in the following 5 dimensions:

	Dimensions
1	Annual return
2	Volatility by measuring standard deviation and variance
3	Risk by measuring beta
4	Sharp ratio which measures the return of an investment compared to its risk
5	Treynor ratio which measures the reward towards volatility ratio

1.2.1 Results of Evaluation

	DJIA	Ours
Annual return	-0.105	0.0323
Variance	0.0412	0.0354
Standard deviation	0.203	0.188
Sharpe ratio	-0.517	0.172
Treynor ratio	-0.00352	0.0102
Alpha	3.77	0.443
Beta	29.8	3.15

Table. 1 results of both portfolio

	DJIA	Ours
Annual return	Negative Return	Positive Return
Risk	High	Lower
Return of an investment compared to its risk	Negative Return	Positive Return

Table. 2 performance evaluation

In Table. 1, one would like to focus on three metrics, namely the annual return, Sharpe ratio and beta. These three metrics have the most significant contrast between both portfolios. Our portfolio scored 0.03,0.172 and 3.15 on annual return, Sharpe ratio and beta respectively, while the DJIA is –0.105, -0.517 and 29.8 respectively. In other words, our portfolio is gaining more annual return (positive number of annual return), more return of an investment compared to its risk (positive number of Sharpe ratio) and less risk (beta is smaller than DJIA) than the DJIA portfolio.

1.3 Potential Reasons of why our portfolio is effective

There are numerous reasons why our portfolio is generally performing well than the DJIA one. These are some common reasons:

- The stocks are not focused on a single industry – diversifying investments.
- Daily product stocks are less susceptible to shock
- The portfolio evaded some stocks that are doing bad in the macroeconomic situation (I.e. Tech companies are affected by sanctions and war)

1.4 Conclusion

The portfolio constructed by our team is found to be performed better than DJIA in terms of risk and return for the period January to October 2022. Yet, one limitation was the short-limited time frame.

It is recommended that to study the risk and return over a longer period to evaluate if our portfolio outperforms DJIA in different social and economic environments. We could also analyze the correlation between weightings and the portfolio return. Therefore, to maximize the returns.

Part 3 Textual Analysis and Readability

Four Academic papers were downloaded manually and computed for the readability of page 5 of each file. The results are 12.39, 13.45, 12.33 and 12.81.

Meanwhile, the readability of the four annual reports were computed and the results are 15.53 for Chevron, 23.78 for Coca-Cola, 17.49 for P&G and 17.26 for JP Morgan.

In this part, we will use the average Gunning Fog Index of page 5 of the four academic reports compared with that of annual reports of the four selected firms. The Index considers the total words, total sentences, and number of complex words. The index indicates the readability of the report by using the educational level required to understand the contents. If the index gives a level of 5, meaning at least fifth-grade education level is required to understand the text. The bigger the index, the higher complexity of the text and the lower readability.

The average fog index of academic reports is 12.7 while that of annual reports is 18.5. There is a difference of 5.77. Both require high school and above level to understand. Yet, a difference of 5.77 means the annual reports have lower readability. By comparing page 5 of each document, the annual reports have more words and sentences than academic papers. The words and sentences are limited by the 1.5 paragraph spacing of the academic papers. In terms of word complexity, annual reports were found to be higher than academic papers. The use of complex words, words with more than three or more syllables, are more frequent in annual reports.