Stock Market Simulation

An Interactive Qualifying Project Report: Submitted to the Faculty of

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By

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Approved by Professor Dalin Tang, Project Advisor

Abstract

Our project consists of a six week simulation with a goal to become more knowledgeable in stock trading in order to make profit during the simulation. The simulation mimics the real market with the exception that we are using $100,000 of simulated money for each simulation. Momentum trading and swing trading methods were used for each simulation where we traded stocks from the same five companies in both simulations. With the market indices were down about 4.3% at the end of the simulation, the momentum trading simulation returned -8.8% while swing trading returned -7.6%. The results indicate that swing trading was able to perform a little better than the momentum trading simulation. After the simulation and analysis, we were able to gain more knowledge and experience with trading stocks.

Acknowledgments

We would like to thank Professor Tang for his help and guidance throughout our Interactive Qualifying project (IQP) as well as our parents for the continued support. This IQP would not have been possible without the help of these individuals.

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Chapter 1: Introduction

1.1 Goals and General Plan

The goal of this Interactive Qualifying Project is to learn and become familiar about how the stock market works by doing a six-week stock market simulation and compare the advantages and disadvantages of two different stock trading techniques: technical and swing trading. The first two weeks of this project will be spent on researching the stock market history, the different trading techniques that we want to try, and to be able to analyze our findings using a stock market simulator throughout the duration of this Interactive Qualifying Project. After the research phase, we will run the six-week simulation using two different investment methods starting with the same parameters in order to accurately be able to analyze both methods against each other. The final weeks will be spent on analyzing the data and results of our six week investment period.

1.2 History of Stock Markets

As early as the 1100s, France developed a system that would allow agricultural debts to be managed by courtiers de change through banks within the country. Debts would be traded between people which was one of the first systems that were similar to stock markets. Overtime, a few Italian cities such as Pisa, Venice, and Florence began trading government securities in the early 1300s. Although these were the early examples of systems that were similar to stock markets, the world's first stock market arrived in Belgium in the early 1500s [1].

While the first stock market was "stockless", merchants would trade notes containing promises of lending money to each other rather than using real goods. The trading would take place in the Handelsbeurs; the first dedicated stock exchange building to exist. Due to the Handelsbeurg burning down twice due to fires; the stock exchange was transferred to Brussels in 1997 where the trading continued. The Handelsbeurg now lays in crumbles however, still

continues to draw photographers and tourists who hope to be able to capture the remains of "the pillar of our nascent economy" [2].

In the 1600s, the East India Company was concerned by the amount of risk there was in sailing to the different corners of Earth as few voyages ever made it home. With the lost ships, many countries and financiers would lose a lot of money so the "Governor and Company of Merchants of London trading with the East Indies" corporation was formed. This company allowed investors to purchase shares into multiple companies instead of investing all their money into one ship. This made investing a lot less risky as investors could still make a profit if they bought shares to different ships as they would only lose a certain amount if one of their shares wasn't profitable (ship gets lost). This new system of buying multiple shares was very successful and led to the Dutch East India Company becoming the first publicly traded company in 1602. The Dutch East India Company would release shares that could be bought by investors where each investor would profit a certain amount whenever the East India Company profits [1].

With success often comes failure; it was hard to distinguish between legitimate companies from fraudulent ones. This led to the government of England banning the issuing of shares until 1825 which was a very big stopping point of the London Stock Market from growing into a very powerful system. In 1817, the New York Stock Exchange was created and people were able to invest in stocks on the first day. With all the restrictions in the London Stock Market, investors bought stocks from the New York Stock Exchange instead. Due to the lack of strict trading laws, the New York Stock Exchange became the world's most powerful stock exchange [1].

1.3 Important Factors of the Stock Market

While in reality the stock market is just an auction, there are two categories that encompass the factors that are important to the stock market. Those are fundamental factors and technical factors. These are the wide scope of the factors that move stock prices up or down.

Fundamental factors are made up of two parts; an earnings base and a valuation multiple. An earnings base just measures the earnings power and can be analyzed through multiple methods such as earnings per share (EPS), free cash flow per share or dividends per share. Many industries have their earnings base tailored to their own metrics. For example real estate investment trusts (REITs) use funds from operations (FFO) to measure their earnings power.

A valuation multiple expresses future expectations of the stock, it is based on the discounted value of the future earnings system. This can be broken down into two parts; the expected growth in the earnings base and the discount rate. The expected growth in the earnings is simple, the higher the growth rate, the higher the multiple and the lower the earnings, the lower the multiple. The discount rate is a function of perceived risk, and inflation. With higher inflation and risk, the stock earns a higher discount rate which means a lower multiple and vice versa.

Technical factors are external circumstances that affect the price of a stock. These factors include inflation, economic strength of market and peers, substitutes, incidental transactions, demographics, trends, liquidity and news. High inflation drives multiples down while low inflation drives multiples up. Economic strength of market and peers means that the strength of the market and peers affect not only themselves but also the stocks within their sector. Substitutes are investments in the company from both government and private agencies. Incidental transactions are based on the inherent value of the stock. This can be insider trading or an institution making purchases or shorting the stock.

Demographics include middle aged and older investors. Middle age invest in the stock market while the older investors pull out of the market. Trends are simply the short term movement of the stock. Liquidity is based on how much interest there is in a specific stock. Blue chip stocks tend to have high liquidity due their ability to hold interest when the market is bull or bearish. News of a company will drive prices of stocks both up and down considering the news, while it is hard to quantify it is simple in nature. Market sediment is how the participants in the market feel about the market both individually and collectively. All these factors affect the market in their own way and combine to affect the market as a whole. These technical factors are hard to track due to the many factors [3].

1.4 Stock Market Index

The stock market is made up of thousands of stocks that represent various companies. A stock market index uses data from these companies to show how the market is being seen by investors and how the economy is doing. These indexes usually focus on smaller subsets of the market which allows for showing how particular subsets of the market are performing compared to the whole market. There are four major indexes that are used to track the market. The NASDAQ tracks the technology sector of the stock market. The Dow Jones tracks the largest 30 U.S. companies. The S&P 500 is made up of the 500 largest companies. The Russell 2000 is the benchmark for smaller U.S. stocks. These indexes allow for investors to invest in multiple companies rather than on individual biases.

Since stock market indexes are usually made up of groups of stocks, each stock within the index is assigned a weighting to it. Higher weightings affect the indexes movement more than those with lower weights. There are three different ways that indexes assign weightings which include price weighted indexes, market capitalization weighted indexes and equal weight indexes.

Price weighted indexes are indexed off the price of the stock, for example if an index is made up of three stocks with share prices of $60, $25, and $35, the $60 share would hold 60% of the index's weight and so forth. The Dow Jones uses price weighted indexes. Market capitalization weighted indexes use the market cap of each company to weigh where they are indexed. For example bigger companies such as Apple and Google would hold bigger weights than smaller companies. Equal weight indexes hold the same weight for each company [4].

1.5 Past Stock Market Crashes

While stock market crashes do not hold an exact definition, they are usually represented by a quick double-digit loss percentage loss in a major stock market index such as the Dow Jones or S&P 500. These crashes are due to big sell offs of stocks due to various factors, both fundamental factors and technical factors. The first notable stock market crash was in 1929 and the United States has seen a few since then as seen in Figure 1.1.
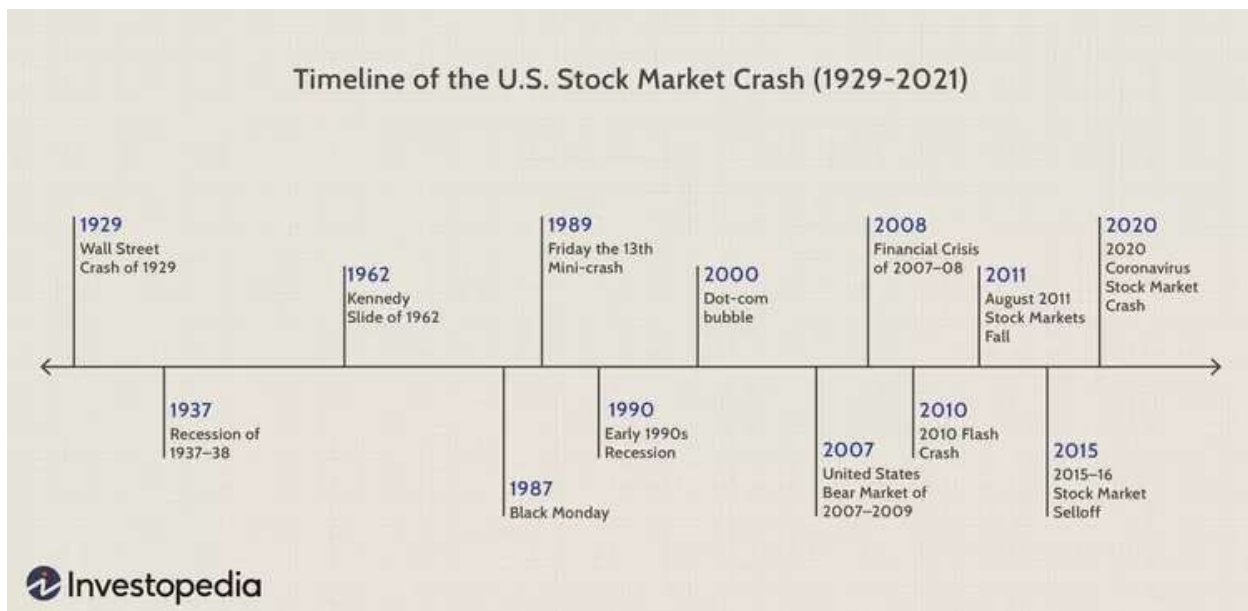
Figure 1.1 Timeline of Stock Market

The first stock market crash was the Wall Street Crash of 1929. During this the Dow dropped 21% on Oct. 24, 1929 and an additional 25% in the week that followed. This was due to

the Federal Reserve implementing anti inflation actions as well as the rapid expansion of investment trusts, public holding companies, and the amount of shares that were bought on margin. This plunged the market in a recession that did not fully recover until 1954.

Fast forward to more recent crashes, such as the Financial Crisis of 2008, the market has evolved but the basic ideas of a market crash have remained the same. In the Financial Crisis of 2008 the United States congress failed to pass a bill that would bail the banks out after bad housing market speculation. This caused the Dow to drop 777.68 points in one day and drop over 50% over the course of one year.

Finally the most recent crash was the Coronavirus Stock Market Crash of 2020. This was due to fears of COVID-19 and business shutting down causing the Dow to drop 37% in March of 2020. The market was able to rebound rapidly by August of 2020, breaking records. However, with new variants being found the effects of this crash can still be felt [5].

1.6 Current Stock Market Sentiment

As of January 2023, the stock market has been in a "bear" market for about the past year. Investors use the terms "bull" and "bear" to describe how the overall market is doing or their own investment strategies. A bull market is a market that is gaining in value, where stocks are going up in price. A bear market is a market that is losing in value, where stocks are going down in price. Money can be made in both markets using different strategies [6].

The current market is a bear market for a few reasons. These include remaining effects from COVID-19, the current war in Ukraine, and United States' current economic situation with regards to inflation. COVID-19 caused a sharp decline in the market in 2020 and as new variants are discovered, the fear of more businesses being shut down due to government restrictions still

affect the market. Also, businesses are still shutting down due to the loss of business in 2020 which affects the market negatively [7].

The current war in Ukraine also is affecting the market negatively as well. Russia was accounting for nearly 10% of the world's oil and natural gas production. Many counties, including the United States imposed sanctions on Russia banning the importation of Russian commodities which negatively hurt both Russia and the United States' economy. There are also fears of the economies being negatively hurt due to fears of the war escalating to something bigger [8].

The United States is currently experiencing unprecedented levels of inflation at 7.1%. It is reported that about 43% of people are experiencing this inflation, citing that it is impacting their everyday expenses. This is bad for the economy because people will spend less money, stimulating the economy less. It is reported that 56% of households in the United States plan on saving more money this year than in years previously. Higher priced items such as items in the technology sector saw a decrease in sales this year due to higher prices and tighter budgets. This all adds up and causes a bearish market [9].

Chapter 2: Methodology

2.1 Stock Market Simulation Platform

Given the popularity of stocks and the lure of making money, there are many stock market simulations out on the internet that can be used to practice and learn how to trade stocks. These simulators allow participants to practice trading without actually buying or selling stocks, and can be used to learn how to make informed decisions about where and how to invest.

An example of one of the numerous stock market simulations out there is Investopedia which offers a simulation with over 6,000 equities to practice investing and trading with [10]. Investopedia Stock Market Simulator is a great way for new stock traders to try out the stock market without risking real money. It allows users to practice buying and selling stocks, test strategies, and try different investors without the risk of losing any real money. The simulator is also a great tool for experienced investors as it allows them to test their strategies and see how they reflect in the markets in a realistic environment. Paper trading is one really important tip that many new investors should use before investing their money in the markets.

We decided to use a stock market simulation platform to test out our trading methods because it allows the players to practice investing and compete with each other, allowing us to analyze the different strategies to see which one turns the most profit. The simulation is set up to be very realistic to the real stock market.

When starting the simulation on Investopedia, we are given $100,000 in virtual cash where we are able to monitor and manage your holdings in real time in the portfolio tab. Figure 2.1 below shows what we can see on the portfolio page. An overview of the account value, today's change, annual return, buying power, and cash can be seen on the top left of the portfolio. The graph in the middle of the screen allows us to see the performance chart to see how well their investments are doing

over time. The holdings tab on the bottom of the portfolio allows us to see how each individual investment is doing as well as when the market will be opening again. Next to the portfolio tab is the trade, research, learn, and game tab where we are able to trade and learn more about the different investment options and can learn more about the companies that you would like to invest in.
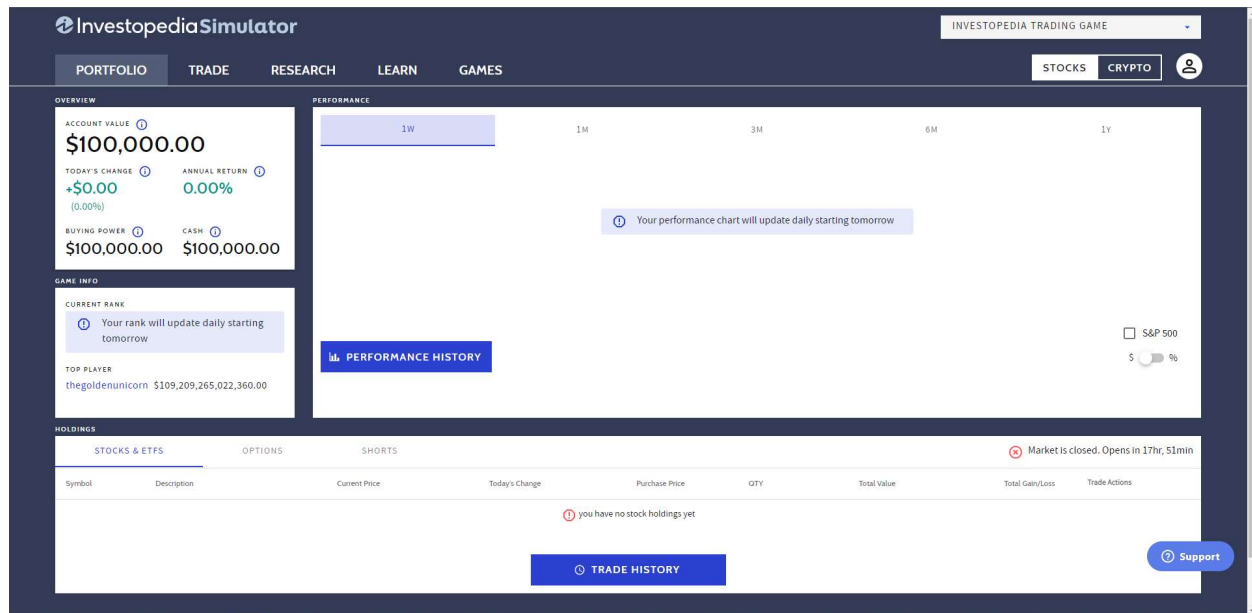
Figure 2.1 Portfolio Tab

The trade tab can be used to buy and sell stocks by searching for the company name. Once a company is searched, information about the stock such as the current volume and bid/ask price can be seen as well as a graph with the stock prices over time. Figure 2.2 shows an example of what we can see after selecting a company such as Apple.
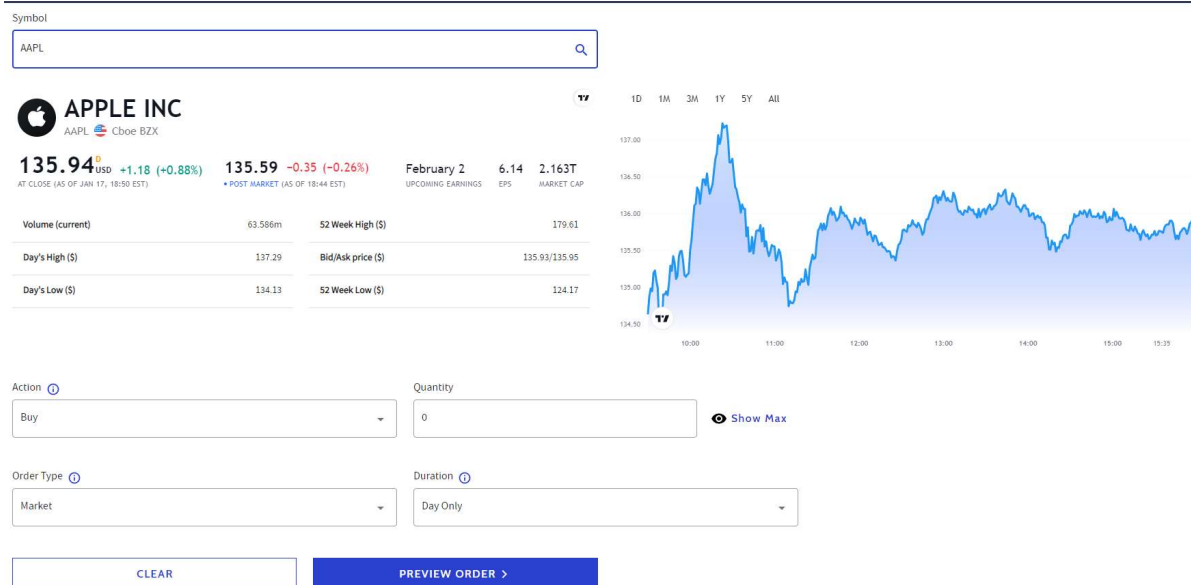
Figure 2.2 Trade Tab

The research tab can be used to see current and past trends of companies they are interested in investing in. This is a useful tool to figure out if it's worth buying or selling a particular stock as well as being able to look at the fundamental data of any company we would be interested in looking into. Figure 2.3 shows the research tab where the most popularly traded stocks show up in order followed by their trends underneath. Particular companies may be searched in the Symbol tab to easily filter out what companies you are interested in.
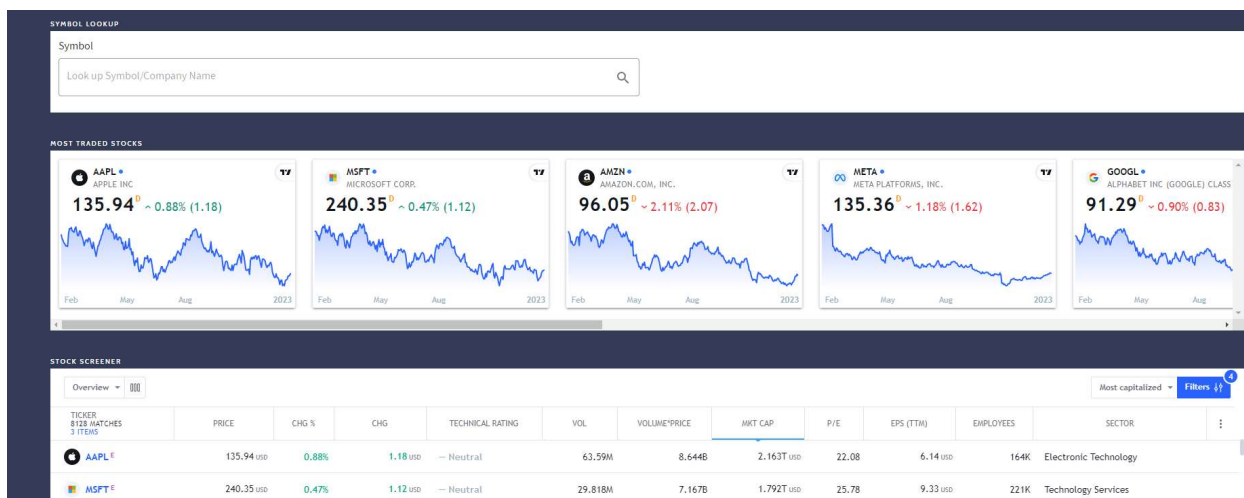
Figure 2.3 Research Tab

The learn tab is useful for learning how to use the stock market, stock trading basics, trading strategies, as well as how to manage a portfolio. This tab is very useful when first starting out because it teaches us all the basics we need to know to start investing.

The final tab is the game tab which shows us the leaderboard of current games we are in along with being able to create and join other games. The leaderboard is very helpful because we can compare our stock trading with each other to gauge how well our investments are doing.

2.2 Momentum Trading

Momentum trading is a strategy that uses market volatility to make money. The idea is to take short term positions of stocks going up and to sell them as soon as they show signs of going down. With the new capital that the investor made off the first trade, they can then invest more money into new positions which repeat the first trade. The idea is that market volatility moves like waves and the idea is to jump from the wave that is about to crash to the one that is building momentum [11].

This strategy requires strict risk management that protects the investor from volatility, overcrowding, and hidden traps. This risk management involves choosing the right equities, timing of opening and closing the trades, entry timing, managing spreads and holding period and exit points. Staying away from leveraged or inverse ETFs and sticking with regular funds and securities that trade more than 5 million shares per day is a way of managing the right equities.

Jumping into positions too soon before the movement has been confirmed or closing the position too late are examples of poor timing. This means not missing trends, reversals or signs that might be a surprise to the market. Early trends are the most profitable and should be seeked out while aging trends should be avoided. This is easy in concept but hard to put into practice.

Managing the bid/ask spreads is crucial to risk management as well. If the spread is large, the security requires a larger movement to be profitable [11].

Order book

	Bid	Ask	
20.04	18 717.28	18 727.15	2.28
2.65	18 715.41	18 729.02	5.2
17.75	18 714.91	18 730.89	12.65
0.24	18 711.91	18 732.77	25.32
10	18 706.42	18 734.64	48.9
6	18 705.92	18 735.14	12
8.28	18 704.92	18 735.64	8.04
16	18 703.92	18 743.13	9.92
9	18 702.92	18 745.01	6.75
8.96	18 701.42	18 745.51	14

BID — The price a buyer is willing to pay for an asset

ASK — The price a buyer is willing to pay for an asset

SPREAD — The difference between the **BID** and **ASK** prices

Figure 2.4: Illustration of Bid and Ask Price [12]

Exiting the trade when the stock is in an overextended technical state is the ideal situation. This is identified by a series of vertical bars on the 60-minute chart. Overextended is when the price of the security breaks through the return trendline as illustrated in Figure 2.5. It is critical to set stops and tighten them when technical barriers hit a major trendline or previous high/low. This strategy heavily relies on technical analysis [11].

Figure 2.5: Example of an overextended stock using AAPL [13]

This strategy is hard to do and requires an investor who is willing to watch the charts carefully and pick good entry and exit points. It requires discipline to cut losses when signs of loss are showing and getting out ahead while the profit builds. If done properly can make impressive returns on investments [11].

2.3 Swing Trading Simulation

Swing trading is a strategy that uses technical analysis in order to capitalize on short to medium gains when trading over a longer period of a few days to weeks. By analyzing patterns of a stock going up or down, swing traders will initiate trades over a period of time to hopefully gain money during a potential price move. Swing trading requires traders to identify and predict if the stock will increase or decrease from the point of purchase to when they are going to sell. Many swing traders will place a stop-loss which means that they will sell the stock once they have lost a

certain amount of money. By placing a stop-loss, the trader will limit the amount of money they can lose minimizing the risk they are taking. The swing trade technique is aimed to make short term profits by relying on technical analysis which is a simplified method of trading [14].

As opposed to day trading which takes a lot of daily commitment, swing trading may require some trading on days while no trading on others. Your position should be checked periodically however, this allows swing traders to be able to maintain multiple trades at once without getting overwhelmed [15].

When swing trading, there are three key elements to look out for when entering the market. The Trade entry point (Point A in Figure 2.6), is where you should look into buying into the market. You want to try to buy at the point when the stock is starting a slow increase in order to potentially capture a potential price move. Figure 2.6 shows the red line B and the green line C which are the stop loss and price forecast respectively. The stop loss represents the limit you are willing to lose until you sell while the price forecast is the exit level where you cashout.

Figure 2.6 Three most important points in Swing Trading [16]

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2.4 Data Analysis Method

In order to analyze data, there are a few stock market indicators that can help determine whether to buy or sell stocks. Stock market platforms will usually provide these indicators by analyzing data points using a statistical formula. A trader can then use the indicators to find patterns and trends in order to determine if they should hold, buy, or sell [17].

The Average Directional Movement Index (ADX) is an indicator that can be used to determine the strength of a particular trend in the price of a stock. On average, the number of time periods is set to 14 however, some analysis will set the time period anywhere between 7 to 30. The ADX is shown on a chart ranging from zero to 100 as a line indicating a very weak trend at zero to a very strong trend at 100. Readings under 25 signify a weak trend. Readings between 25 and 50 indicate a moderate trend while a reading over 50 indicates increasingly stronger trends. When the price of a stock is increasing while the ADX levels are also increasing, this may be a good sign to buy, however, if the price of a stock is increasing while the ADX levels are decreasing, this may be a sign to sell as it may show that the market is losing momentum. The ADX levels only indicate trend strength, not the trend direction so it is important to use other indicators in order to fully analyze the market [18].

The Relative Strength Index (RSI) is an indicator that measures the magnitude and speed of price changes in the market. The RSI is displayed on a line graph ranging from zero to 100 which is similar to the ADX. Ratings of over 70 means that is a good time to sell because it may mean that the stock is overvalued. A reading under 30 indicated an oversold condition signifying a good time to buy because the stock may be undervalued [19]. Using the RSI, investors should aim to buy when the reading is under 30 and sell when the reading is over 70 to increase their chances of profiting.

Chapter 3: Selected Companies

For this simulation, five companies will be selected and traded with each trading strategy. However, each strategy has requirements for the chosen companies. For the momentum trading strategy, leveraged or inverse ETFs will not be chosen along with companies that trade less than 5 million shares per day. Swing trading has less restrictions with what companies are chosen and any company chosen based on the momentum trading strategy requirements will work with swing trading.

One of the keys to being successful in the stock market is diversifying. Diversifying is, in layman's terms, not pulling all the eggs in one basket. The stock market has 11 different sectors but for this simulation five companies from the five most popular sectors will be chosen. The sectors that companies will be selected from are information technology, healthcare, industrials, utilities, and financials. The one month graphs were looked at and were used to determine the company had potential to make money. This is because the simulation is done over six weeks, which the one month graph would accurately represent.

3.1 Information Technology Sector

For the information technology sector the company that was selected was Alphabet Inc. Alphabet Inc is traded on the NASDAQ exchange under the symbol GOOGL. This company fits well with the requirements due to it having a daily volume of about 31 million shares traded. This is seen below in figure 3.1. Alphabet Inc is the 4th most valuable company by market cap which makes it a perfect candidate for this simulation [20].
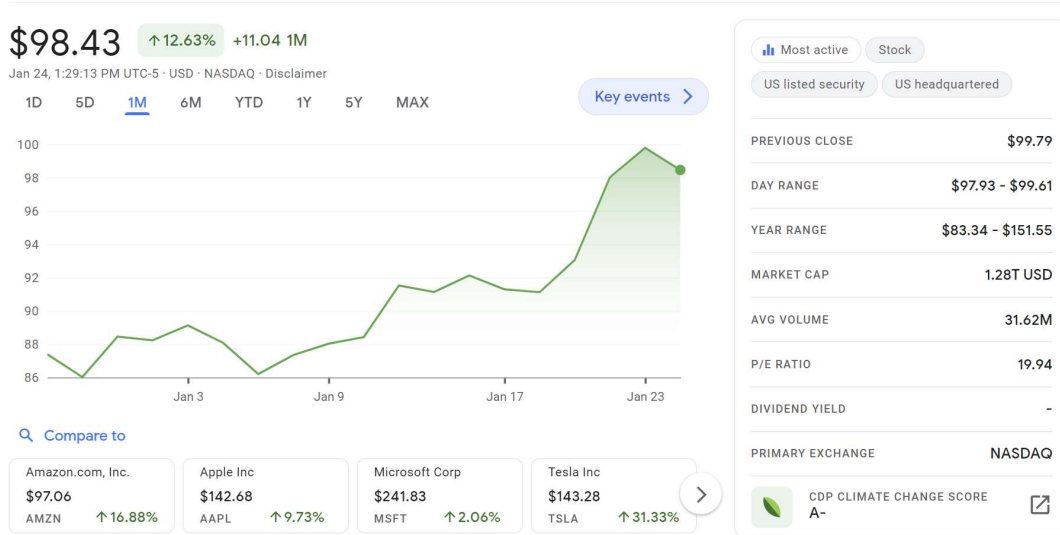
Figure 3.1 GOOGL One Month Graph [21]

3.2 Healthcare Sector

For the healthcare sector the company that was selected was Teladoc Health Inc. Teladoc Health Inc is traded on the NYSE under the symbol TDOC. Finding a healthcare stock that performed well within the past year, and month was hard to find. Teladoc has performed well this past month with an about 20% gain. This is seen below in figure 3.2. Teladoc Health Inc has an average volume of 4.34 million shares per day. This is slightly concerning since momentum trading should be done with stock above 5 million shares per day. However, this will test the trading method to see if having a volume of 5 million shares per day is required to be profitable [22].
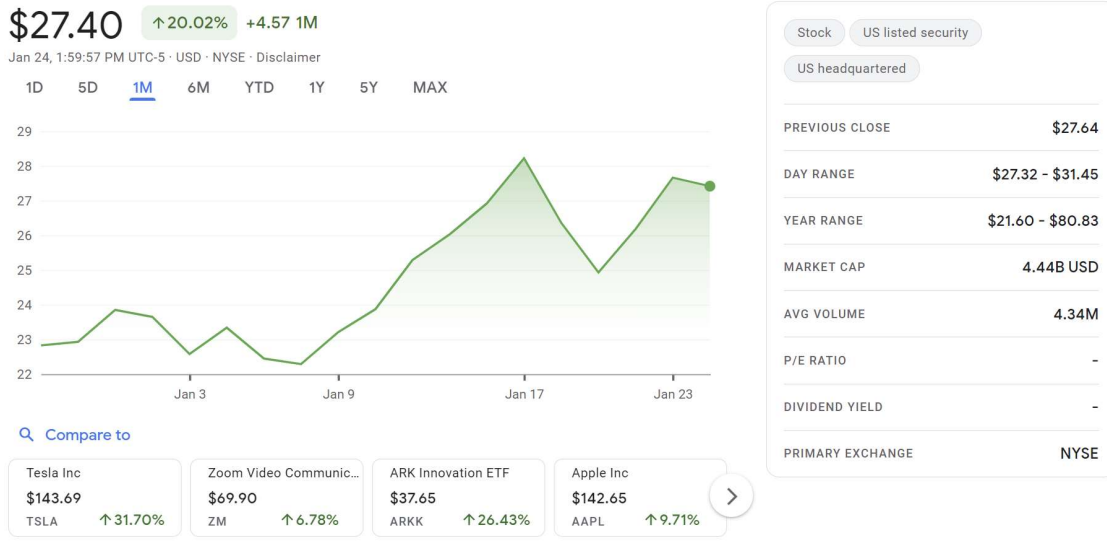
Figure 3.2 TDOC One Month Graph [22]

3.3 Industrials Sector

For the industrials sector the company that was selected was Boeing Co. Boeing Co is traded on the NYSE under the symbol BA. This company fits well with the requirements due to it having a daily volume of about 6.86 million shares traded. This is seen below in figure 3.3. Boeing is a multinational aerospace corporation that has a market cap of $125.66 billion. This makes this company an excellent selection for this simulation [23].

Figure 3.3 BA One Month Graph [24]

3.4 Utilities Sector

For the utilities sector the company that was selected was Dominion Energy Inc. Dominion Energy Inc is traded on the NYSE under the symbol D. This company fits well with the requirements due to it having a daily volume of about 5.61 million shares traded. This is seen below in figure 3.4. Dominion Energy Inc is a North American power and energy company that has a market cap of $52.20 billion. This makes this company an excellent selection for this simulation [25].

Figure 3.4 D One Month Graph [26]

3.5 Financial Sector

For the financial sector the company that was selected was JPMorgan Chase & Co. JPMorgan Chase & Co is traded on the NYSE under the symbol JPM. This company fits well with the requirements due to it having a daily volume of about 10.39 million shares traded. This is seen below in figure 3.5. JPMorgan Chase & Co is an American multinational financial services company that has a market cap of $406.42 billion. This makes this company an excellent selection for this simulation [27].
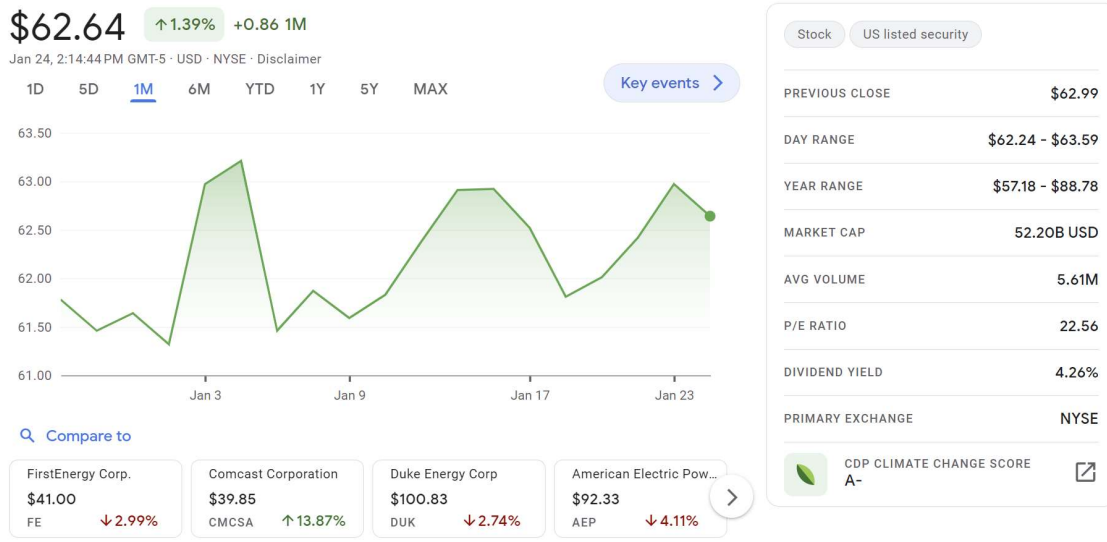
Figure 3.5 JPM One Month Graph [28]

Chapter 4: Momentum Trading Simulation

The momentum trading simulation is to test out the momentum trading strategy that was described in Chapter 3. It began in the same way as the swing trading strategy where each company had between $19,000 to $21,000 worth of stock to start with a total investment of $99,747.43. With the constant change in price, it made it impossible to invest exactly $20,000 into each stock; however, the difference between the amount invested for each company was minimal.

4.1 Week #1

For the first trading week, all the stocks were bought on Monday, February 6th, 2023. Each company had between $19,000 to $21,000 worth of stock to start with a total investment of $99,747.43. In order to be able to have an even comparison with swing trading, each portfolio was started with an equal amount of shares for each stock.

For this week, the transactions made this week are based on the data analysis methods that were explained in chapter 2.2. The entry for most of these stock purchases looked promising with each stock being in the green on 2/6. On 2/7 no stock showed signs of breaking through or losing too much. However midday on 2/8, Alphabet Inc, GOOGL dropped 2.8%. For the momentum trading strategy being tested, if the stock goes up 3% it is sold and if it drops 3% it is sold. On 2/9 GOOGL dropped to 3.90% total and it was sold, .9% over the limit set. This is seen in Figure 4.1 with GOOGL's chart for the week.

Figure 4.1 GOOGL over the week of 2/6/2023

The other stock that was traded was D, Dominion Energy. On 2/8 the stock showed signs of breaking through rising at 2.8%. However on 2/9, D dropped 3.44% but rebound to 2.8% within the same day. On 2/10 D an additional 3.60% total to a total of 6.37% and it was sold. This was 3.37% over the limit set. This stock was a good learning experience to set trailing stop orders to prevent the loss of money when not looking at the charts. It also shows that the charts have to be monitored as much as possible to make as much profit as possible and limit the amount of loss taken. This is seen in Figure 4.2 with D's chart for the week.

Figure 4.2 D over the week of 2/6/2023

Table 4.1 below shows all the transactions from week one from the momentum trading portfolio. The net cost indicates how much money was spent/made from buying/selling the stocks while the profit/loss tab shows the outcome after selling a particular stock. The total cash shows the resulting amount of cash left over that could be used for other investments while the total profit shows how much money has been made over the week. Over the week had a net total loss for -$2,231.71 or 2.23% of the portfolio.

Table 4.1 Momentum Trading Portfolio Transactions Week 1 (2/5-2/11)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
2/6/2023							100,000.00	
2/6/2023	GOOGL	Buy	102.90	193	19,859.70	0.00	80,140.30	0.00
2/6/2023	TDOC	Buy	30.31	649	19,671.19	0.00	60,469.11	0.00
2/6/2023	BA	Buy	207.26	95	19,689.70	0.00	40,779.41	0.00
2/6/2023	D	Buy	61.74	330	20,374.20	0.00	20,405.21	0.00
2/6/2023	JPM	Buy	141.92	142	20,152.64	0.00	252.57	0.00
2/9/2023	GOOGL	Sell	94.39	193	18,217.29	-1,642.41	18,933.60	-1,642.41
2/10/2023	D	Sell	57.88	330	19,100.40	-589.30	38,034.00	-2,231.71

4.2 Week #2

For this week, the transactions made this week were based on the data analysis methods that were explained in chapter 2.2 along with lessons learned from the previous week. Three companies were traded this week including TDOC, BA, and GOOGL. The beginning of this week started with the selling of TDOC 2/14. TDOC dropped a total of 3.3% since week one causing it to sell it for a loss of -$811.25. TDOC was then bought on 2/15 for $31.40 a share since it showed signs of breaking out and rising in price. This is seen in Figure 4.3. However, this analysis was wrong as the trade entered too late and it dropped to $29.70 for a total loss of 5.4% or $1360 in two days.

Figure 4.3 TDOC over the week of 2/13/2023

TDOC has been valuable in learning about the timing of entering trades which is critical to momentum trading. It also showed how much the charts have to be watched to make sure the stock does not hit the sell limits of 3% profit or loss. Overall this stock lost a total of $2171.25 this week. BA rose a total of 4.5% from the previous week causing it to sell for a profit of $925.77 on 2/14. BA was then bought at $210.11 on 2/17 since the stock appeared to have a good entry point with the stock dropping the day before. It appears to be a good, early entry point since the trendline appears to be going from losing to a gain. This was trade after seeing the poor entry point on the TDOC trade. This trade put the account on margin for about five minutes as the TDOC sell order was pending. The BA graph for this week is seen in Figure 4.4.

Figure 4.4 BA over the week of 2/13/2023

GOOGL was traded a total of three times this week with it being bought on 2/14 at $92.33 and it being sold a day after on 2/15 for $96.39. This was done for a profit of 4.2% or $730.80. This trade was a perfect trade using momentum trading by selling after the stock broke through the return line for a profit. The entry for this trade was also good. The final trade for GOOGL this week was 300 shares being bought for $93.91 on 2/17. The entry point appears to be good with the stock rising about 1.4% at the end of the day on 2/17. The GOOGL graph for this week is seen in Figure 4.5.

Figure 4.5 GOOGL over the week of 2/13/2023

Overall the week resulted in a total of loss of $514.68. This brings the total loss of the portfolio to be -$2746.39. This is seen in table 4.2 which details each trade for week two.

Table 4.2 Momentum Trading Portfolio Transactions Week 2 (2/12-2/18)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost / Proceeds	Profit/Loss	Total Cash	Total Profit
							38,034.00	-2,231.71
2/14/2023	TDOC	Sell	29.31	649.00	19,022.19	-811.25	57,056.19	-3,042.96
2/14/2023	BA	Sell	217.00	95.00	20,615.00	925.77	77,671.19	-2,117.19
2/14/2023	GOOGL	Buy	92.33	180.00	16,619.40	0.00	61,051.79	-2,117.19
2/15/2023	GOOGL	Sell	96.39	180.00	17,350.20	730.80	78,401.99	-1,386.39
2/15/2023	TDOC	Buy	31.40	800.00	25,120.00	0.00	53,281.99	-1,386.39
2/17/2023	GOOGL	Buy	93.91	300.00	28,173.00	0.00	25,108.99	-1,386.39
2/17/2023	BA	Buy	210.11	220.00	46,224.20	0.00	-21,115.21	-1,386.39
2/17/2023	TDOC	Sell	29.70	800.00	23,760.00	-1,360.00	2,644.79	-2,746.39

4.3 Week #3

This week the momentum trading portfolio tallied up a loss of -$1,192.02 from the previous week. The trades for this week are seen in Table 4.3. The week started out with 120 shares of BA being sold for a slight loss of $235.01 on 2/21. This stock was decided to get sold due to the fact that it showed no signs of breaking out and dropped about 0.9%. It was also sold in order to gain funds to purchase TDOC and D. Figure 4.6 shows BA's movement for the week and shows that it was sold at a good time with it dropping more throughout the week.

Figure 4.6 BA over the week of 2/20/2023

The next trade of the week was selling 142 shares of JPM for a slight loss of $235.01 on 2/21 which was about a -0.9% decrease from when it was bought. This stock was also sold in order to gain cash to purchase TDOC and D. It was also stagnant and did not move much up or down since week #1. The weekly chart is seen in Figure 4.7.

Figure 4.7 JPM over the week of 2/20/2023

The first purchase of the week was done on 2/21 with D with a purchase of 450 shares. This was purchased due to the stock looking like it potentially was about to breakout with the stock selling off all day on 2/21 and the volume turning into the green late day 2/21. This is seen in Figure 4.8. Throughout the week the stock has dropped a total of 2.4%. It is being held until week #4 to see if there is a turn around or not.

Figure 4.8 D over the week of 2/20/2023

The second and final purchase of the week was done on 2/21 with TDOC with a purchase of 650 shares. This was purchased due to the stock looking like it had good timing for entry for a trade. This is because of the sharp drop off with the graph as seen in Figure 4.9. Sharp drop offs mean a big sell off which means a good and early entry point for momentum trading. However, this week the stock has dropped a total of 5.2%. It is being held until week #4 to see if there is a turn around or not.

Figure 4.9 TDOC over the week of 2/20/2023

The final trade of the week was done on 2/22 with GOOGL with a selling of 300 shares. This was sold due to the stock dropping below the sell cut off of 3% for this trading strategy. It was sold for a loss of $705.00 making it this week's biggest loss. The graph for GOOGL this week is seen in Figure 4.10 which shows it dropping even more past 2/22.

Figure 4.10 GOOGL over the week of 2/20/2023

Overall the week resulted in a total of loss of $1,192.02. This brings the total loss of the portfolio to be -$3,938.41. This is seen in Table 4.3 which details each trade for week three.

Table 4.3 Momentum Trading Portfolio Transactions Week 3 (2/19-2/25)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
2/21/2023							2,644.79	-2,746.39
2/21/2023	JPM	Sell	140.27	142	19,917.63	-235.01	22,562.42	-2,981.40
2/21/2023	BA	Sell	208.01	120	24,961.19	-252.01	47,523.61	-3,233.41
2/21/2023	TDOC	Buy	28.56	650	18,564.00	0.00	28,959.61	-3,233.41
2/21/2023	D	Buy	58.42	450	26,286.75	0.00	2,672.86	-3,233.41
2/22/2023	GOOGL	Sell	91.46	300	27,468.00	-705.00	30,140.86	-3,938.41

4.4 Week #4

This week the momentum trading portfolio only had one trade with the buying of GOOGL on 2/28. Since week four started with $30,140.86, a purchase of 250 shares of GOOGL was made for $22,770.00. This purchase was made because GOOGL was at an all-time low since the beginning of February, making it a good asset to purchase while it was low since it should go up. This is seen in Table 4.4. The chart of GOOGL is seen in Figure 4.11 since the beginning of February, showing the low point of GOOGL for the month.

Figure 4.11 GOOGL since the beginning of February 2023

GOOGL was the only trade this week to limit the number of losses for the week in total. The general indices such as the DOW Jones were down 4.6% since February 13th, 2023. The NASDAQ was down 4.86% since February 13th, 2023. This meant that the momentum trading portfolio was down about 7% for the week in the middle of week four. While this is over the limit for losses in the momentum trading strategy, with the general indices being also down, it was thought to be better to hold rather than sell all holding for a loss. The market rebounded on Friday, March 3rd 2023 with the DOW Jones rebounding 2.23% and the NASDAQ rebounding 2.72%. This made the general indices to be down 3.91% and the momentum trading portfolio to be down 7.71% as of March 1st.

Table 4.4 Momentum Trading Portfolio Transactions Week 4 (2/26-3/04)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
							30,140.86	-3,938.41
2/28/2023	GOOGL	Buy	91.08	250.00	22,770.00	0.00	7,370.86	-3,938.41

4.5 Week #5

This week the momentum trading portfolio had three trades with the selling of GOOGL on 3/7, the buying of JPM on 3/8, and the buying of GOOGL on 3/9. 250 shares of GOOGL were sold on 3/7 for a profit of $877.50. It was sold since it rose 3% since the last purchase and the stock broke through the return line. 100 shares of GOOGL were then bought on 3/9 for a net cost of $9,480. This purchase was executed since the stock dropped with selling volume for nearly a day and then had buying volume during opening on 3/9, this indicated the stock could possibly break out. As seen in Figure 4.12, that analysis was wrong as the stock continued to drop through week four.

Figure 4.12 GOOGL over the week of 3/5

100 shares of JPM were purchased on 3/8 for a net cost of $13,818. These shares were purchased because the stock has selling volume nearly all day on 3/7 and opened on 3/8 with buying volume. This indicated a possible break out. As seen in Figure 4.13, that analysis was wrong as the stock continued to drop through week four.

Figure 4.13 JPM over the week of 3/5

Overall the total loss at the end of week five is $3,060.91. This is seen in Table 4.5. While the total

profit increased since previous weeks, the total portfolio is down -5.53% in the past week. This is

mainly because the general indices are down such as the S&P 500 are down around -4%. With the

general indices being down, fewer trades were made with hopes of the stocking increasing in price

the following week.

Table 4.5 Momentum Trading Portfolio Transactions Week 5 (3/5-3/11)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
							7,370.86	-3,938.41
3/7/2023	GOOGL	Sell	94.59	250.00	23,647.50	877.50	31,018.36	-3,060.91
3/8/2023	JPM	Buy	138.18	100.00	13,818.00	0.00	17,200.36	-3,060.91
3/9/2023	GOOGL	Buy	94.80	100.00	9,480.00	0.00	7,720.36	-3,060.91

4.6 Week #6

This week for the momentum trading portfolio had two trades before selling all the stocks at the end of the simulation. The first trade was 35 shares of BA on 3/13. These 35 shares were in addition to the 100 shares held from week five. The 35 shares cost a total of $7,152.25. This purchase was done because BA saw a decrease from week five but started on 3/13 with buying volume throughout the day making it a good buy as the stock would increase with purchase volume. This is seen in Figure 4.14.

Figure 4.14 BA over the week of 3/12

The next trade that was done was the selling of 100 shares of GOOGL. These 100 shares were sold for a total profit of $517.00. This was a total of 5.17% increase from the previous purchase of these shares. The increase is why the shares were sold. The graph of GOOGL is seen in Figure 4.15.

Figure 4.15 GOOGL over the week of 3/12

With the general indices going up by around 1% this week the momentum trading portfolio went up around 1.72% this week. On March 16, 2023, all the stocks were sold with an ending balance of $91,240.11. The transactions for this week are seen in Table 4.6.

Table 4.6 Momentum Trading Portfolio Transactions Week 6 (3/12-3/18)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
							7,720.36	-3,060.91
3/13/2023	BA	Buy	204.35	35.00	7,152.25	0.00	568.11	-3,060.91
3/16/2023	GOOGL	Sell	99.97	100.00	9,997.00	517.00	10,565.11	-2,543.91
3/17/2023	BA	Sell	200.70	135.00	27,094.50	-3,142.75	37,659.61	-5,686.66
3/17/2023	D	Sell	55.61	450.00	25,024.50	-1,262.25	62,684.11	-6,948.91
3/17/2023	JPM	Sell	125.92	100.00	12,592.00	-1,226.00	75,276.11	-8,174.91
3/17/2023	TDOC	Sell	24.56	650.00	15,964.00	-2,600.00	91,240.11	-10,774.91

Chapter 5: Swing Trading

The swing trading method began in the same fashion as the momentum trading strategy where each company had between $19,000 to $21,000 worth of stock to start with a total investment of 99,359.41. With the constant change in price, it made it impossible to invest exactly $20,000 into each stock; however, the difference between the amount invested for each company was minimal.

5.1 Week #1

For the first trading week, all the stocks were bought on Monday, February 6th, 2023. In order to be able to have an even comparison with momentum trading, each portfolio was started with an equal amount of shares for each stock.

The transactions made this week are based on the data analysis methods that were explained in previous chapters. As seen in Figure 5.1, the Average Directional Index decreased to around 33 which indicates a weak trend. The blue line and orange line underneath the stock represents the shorter moving average compared to the longer moving average respectively. With the shorter moving average being lower than the longer moving average, we decided that it would not be a good time to buy. The Relative Strength Index was around 57 indicating instead that it would be a good time to sell some of the stock.

Figure 5.1 Boeing Stock on February 10, 2023

The Average Directional Index for Dominion was trending upwards however, was still low at around 24. As the Average Directional Index represents a weak trend, we decided to also sell some of the stock despite the increase in price. The Relative Strength Index was also rising to around 41 which indicates that the stock may soon be overvalued if it continues to rise. We decided to sell 100 shares which led to a loss of $93.00.

Figure 5.2 Dominion Energy, INC on February 10, 2023

The Relative Strength Index is trending downwards on the Google Class A stock showing that the stock may be undervalued so we decided that it would be a good time to buy some extra shares. 96 shares of the stock were purchased at $95.00 per stock.
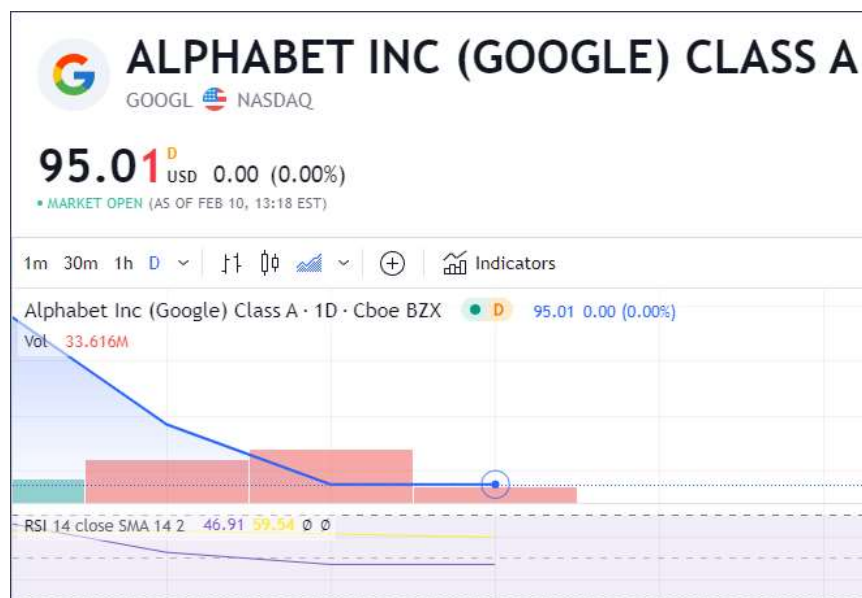
Figure 5.3 Google Class A Stock on February 10, 2023

Table 5.1 below shows all the transactions from week one from the swing trading portfolio. The net cost indicates how much money was spent/made from buying/selling the stocks while the profit/loss tab shows the outcome after selling a particular stock. The total cash shows the resulting amount of cash left over that could be used for other investments while the total profit shows how much money has been made over the week.

Table 5.1 Swing Trading Portfolio Transactions Week 1 (2/5-2/11)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
2/6/2023							100,000.00	
2/6/2023	GOOGL	Buy	102.85	193.00	19,850.05	0.00	80,149.95	0.00
2/6/2023	TDOC	Buy	30.66	649.00	19,898.34	0.00	60,251.61	0.00
2/6/2023	BA	Buy	207.44	95.00	19,706.80	0.00	40,544.81	0.00
2/6/2023	D	Buy	60.46	330.00	19,951.80	0.00	20,593.01	0.00
2/6/2023	JPM	Buy	140.51	142.00	19,952.42	0.00	640.59	0.00
2/10/2023	BA	Sell	211.99	40.00	8,479.60	182.00	9,120.19	250.25
2/10/2023	D	Sell	59.53	100.00	5,953.00	-93.00	15,073.19	157.25
2/10/2023	GOOGL	Buy	95.00	96.00	5,714.88		9,358.31	

5.2 Week #2

On February 13, 2023, we sold 100 shares of JP Morgan Chase & Co and bought 400 shares of Teladoc health. The relative strength index for JP Morgan Chase & Co shows that the stock may be a little overvalued as it was above 50. Although the stock price has increased, the average directional index has been decreasing to around 15 indicating that it was a good time to sell.
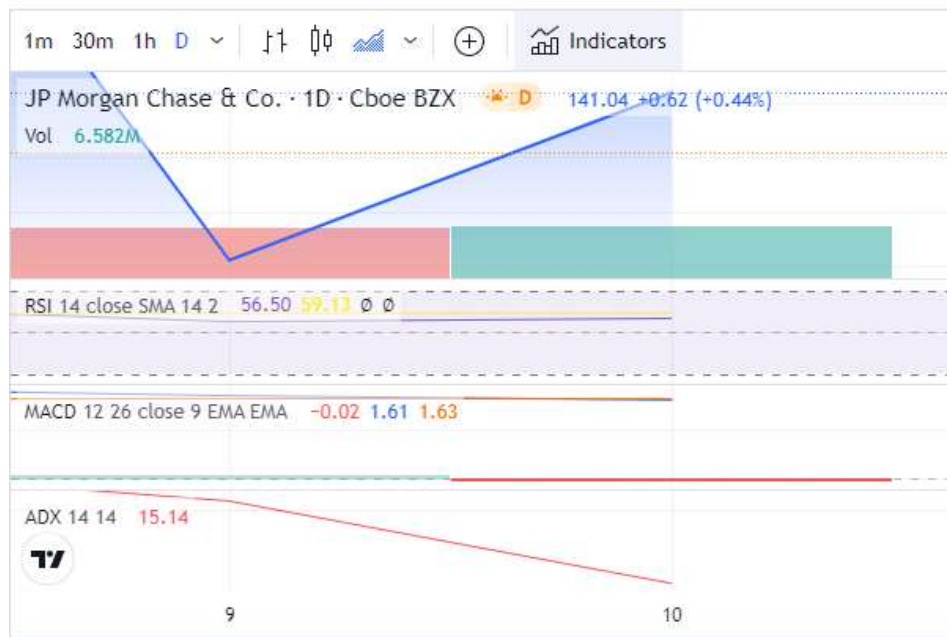
Figure 5.4 JP Morgan Chase & Co Stock on February 12, 2023

The short term moving average for Teladoc Health is still above the long term moving average which indicates that it may be a good time to buy the stock. The relative strength index is at around 52 and trending downwards which may show that it will soon be a good time to buy the stock. We purchased 400 stocks instead of 800 with the cash we have because we want to wait to see if the relative strength index will drop more before potentially buying another 400 stocks. On February 16, 2023, the short term moving average rose to be above the long term moving average. Along with the slow rise in the average directional index, this was a good sign to buy more stock so another 292 shares were purchased.
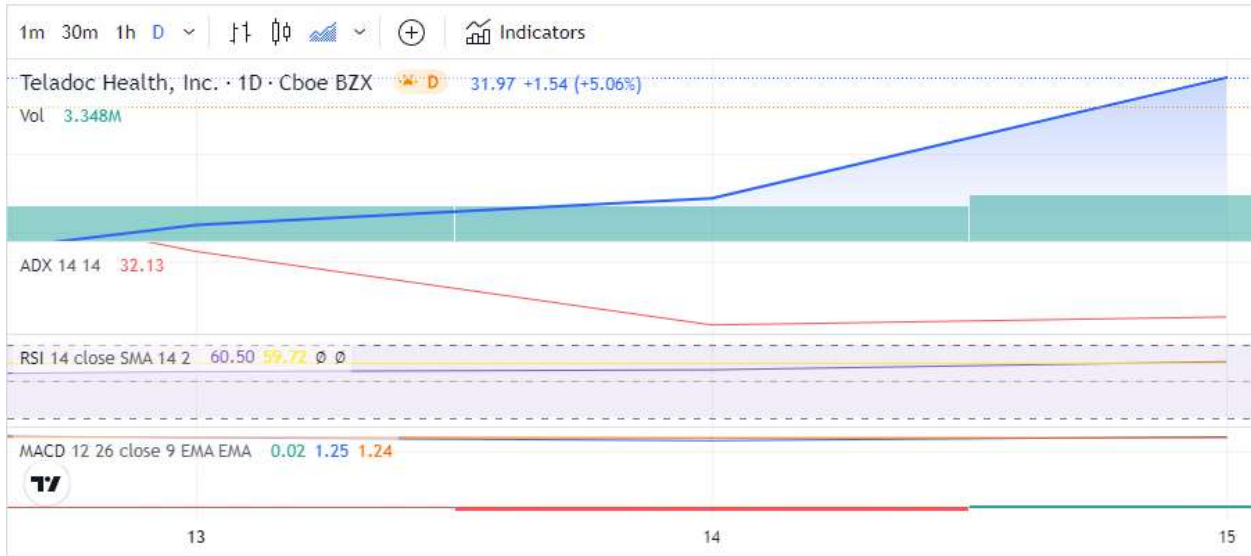
Figure 5.5 Teladoc Health Stock on February 16, 2023

Despite the Google Class A stock rising, the Average Directional Index was decreasing significantly. The relative strength index was a little over 50 which indicates that it is a little overvalued so we sold 100 shares of Google Class A.

Table 5.2 Swing Trading Portfolio Transactions Week 2 (2/12-2/18)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
2/13/2023	JPM	Sell	141.30	100.00	14,130.00	79.00	23,488.31	236.25
2/13/2023	TDOC	Buy	29.14	400.00	11,656.00		11,832.31	
2/16/2023	TDOC	Buy	30.83	292.00	9,002.36		2,829.95	
2/16/2023	GOOGL	Sell	95.37	100	9,537.00	-748.00	12,366.95	-511.75
2/13/2023	JPM	Sell	141.30	100.00	14,130.00	79.00	23,488.31	236.25

5.3 Week #3

On February 22, 2023, we sold 30 shares of Boeing and bought 210 shares of Dominion Energy. The Boeing shares were sold due to the decrease in the Average Directional Index. The relative strength index hasn't changed very much however, it sits above 50 which indicates that the stock may be a little overvalued.
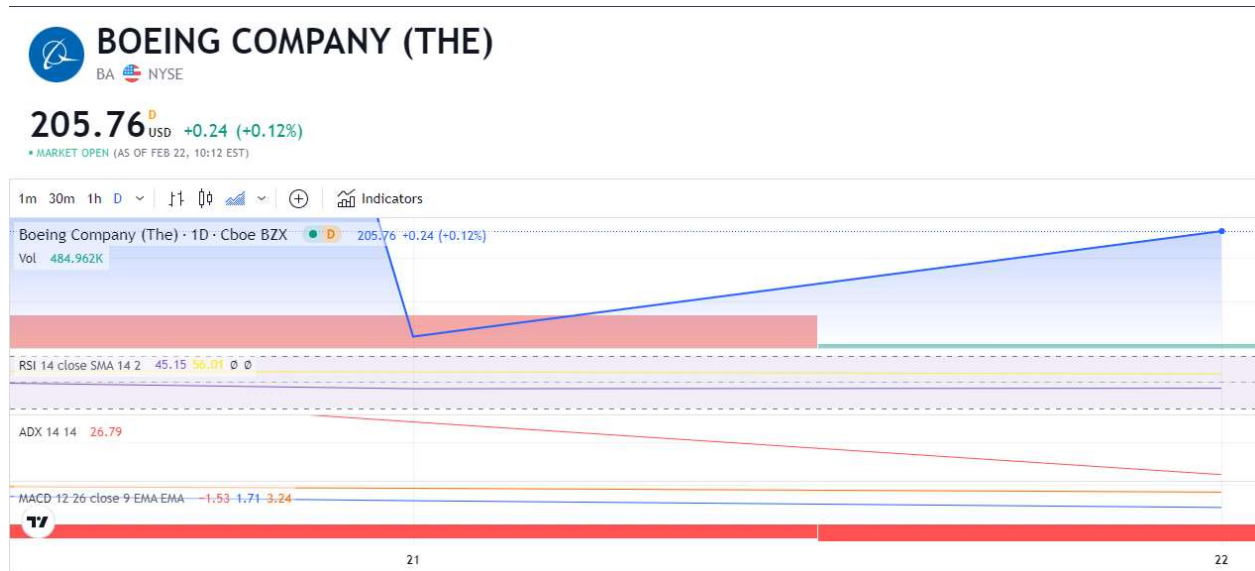

Figure 5.8 Boeing on February 22, 2023

Unlike Boeing, Dominion Energy's average directional index is trending up at around 31. This means that the increased worth of the stock may be a strong trend and will continue to go up. The relative strength index sits under 50 which could indicate that the stock is undervalued.
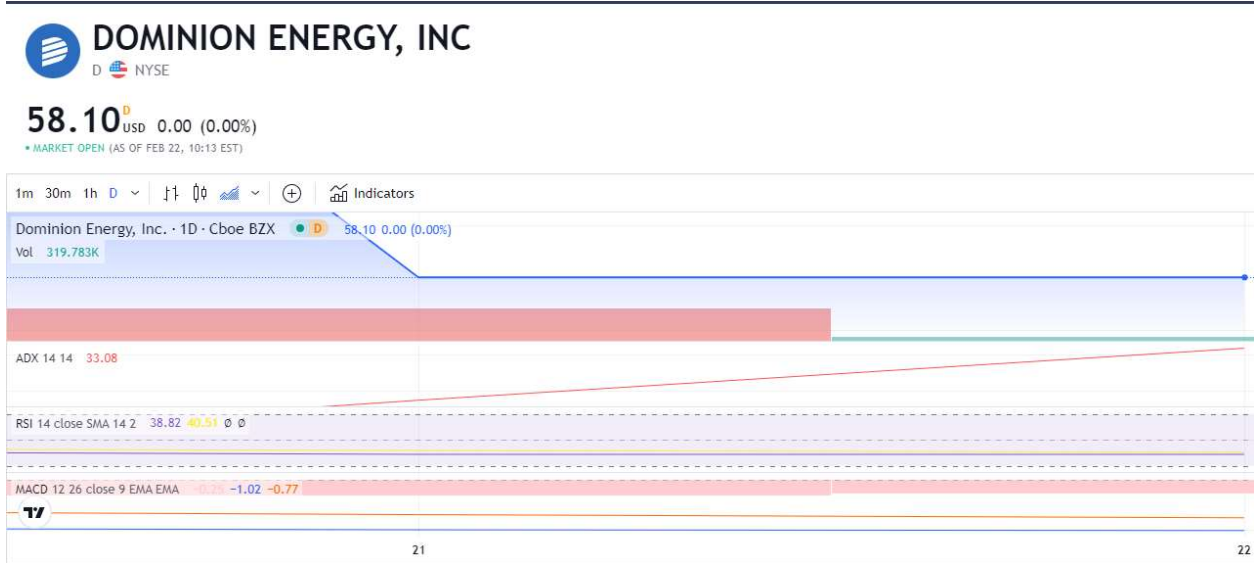

Figure 5.9 Dominion Energy on February 22, 2023

Table 5.3 Swing Trading Portfolio Transactions Week 3 (2/19-2/25)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
							12,366.95	
2/22/2023	BA	Sell	205.97	30.00	6,179.10	-44.10	18,546.05	151.93
2/22/2023	D	Buy	58.06	210.00	12,192.60		6,353.45	

5.4 Week #4

On February 27, 2023, 30 shares of Google Class A were bought. With the average directional index increasing as well as a relative strength index under 50, we decided this would be a good time to purchase some shares.
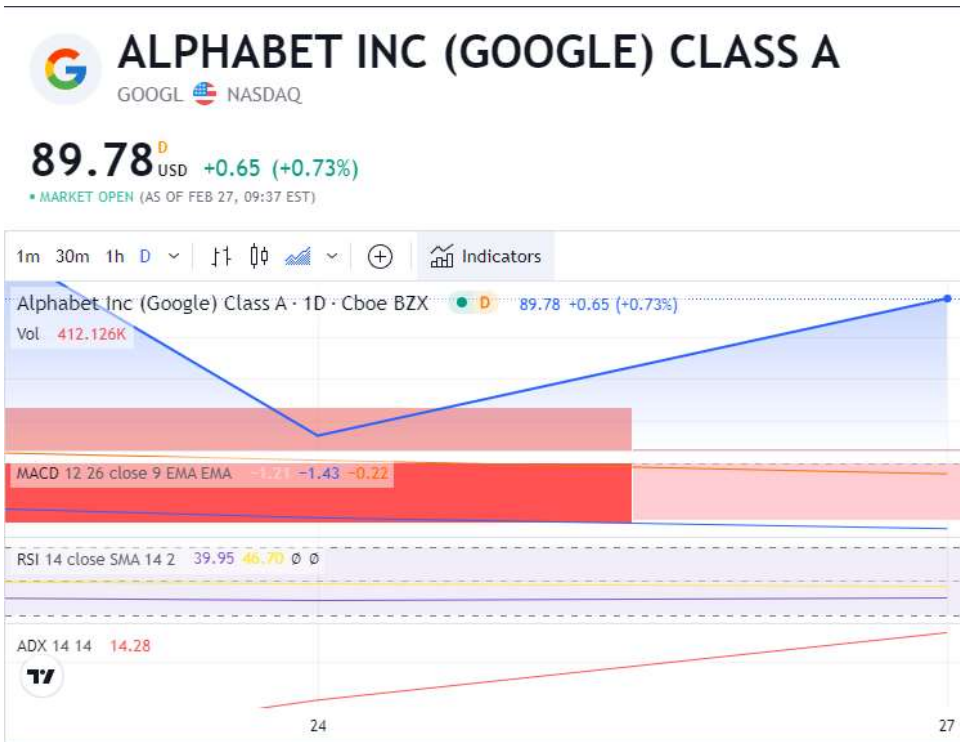
Figure 5.10 Google Class A on February 27, 2023

On March 2nd, 2023, we bought 50 shares of Dominion Energy. Although the price is decreasing, the average directional index is rising and the relative strength index is relatively low showing that the stock is undervalued. Looking at our portfolio on March 1st 2023, our portfolio has lost around 9.81% in the past month while the general indices lost around 3.91%. This could explain a significant portion of the losses we are seeing in our overall portfolio value.

Figure 5.11 Dominion on March 2, 2023
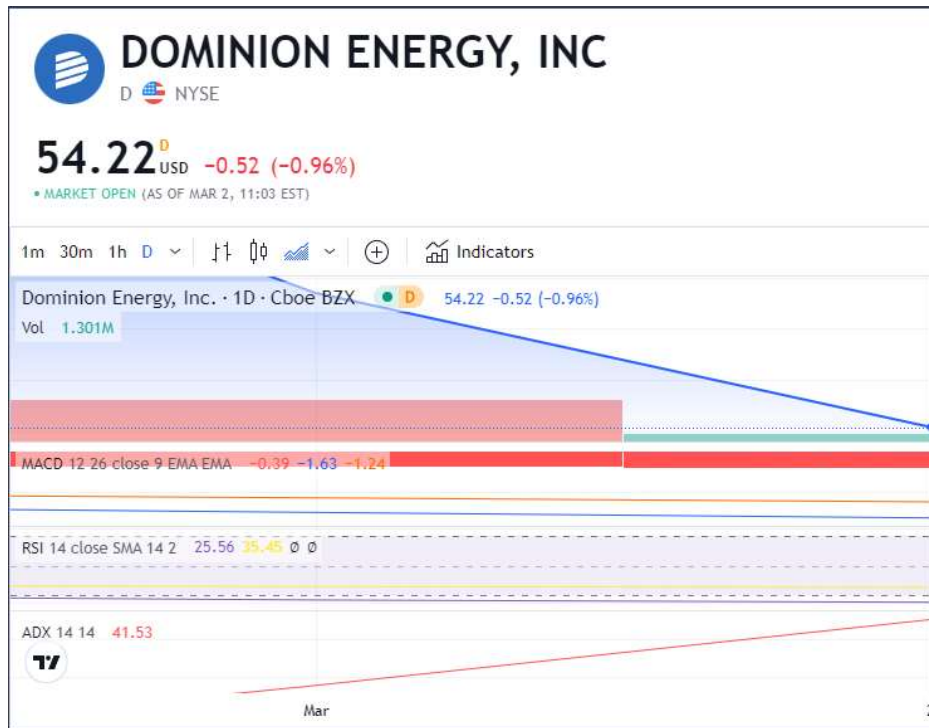
Table 5.4 Swing Trading Portfolio Transactions Week 4 (2/26-3/4)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
							6,353.45	
2/27/2023	GOOGL	Buy	89.66	30.00	2,689.80		3,663.65	
3/2/2023	D	Buy	54.22	50.00	2,711.00		952.65	

5.5 Week #5

On March 6th, 2023, we sold 200 shares of Dominion Energy. With the slowly increasing price but decline in the average directional index, we knew that this was a relatively weak trend so we decided to sell around half of the shares we had.
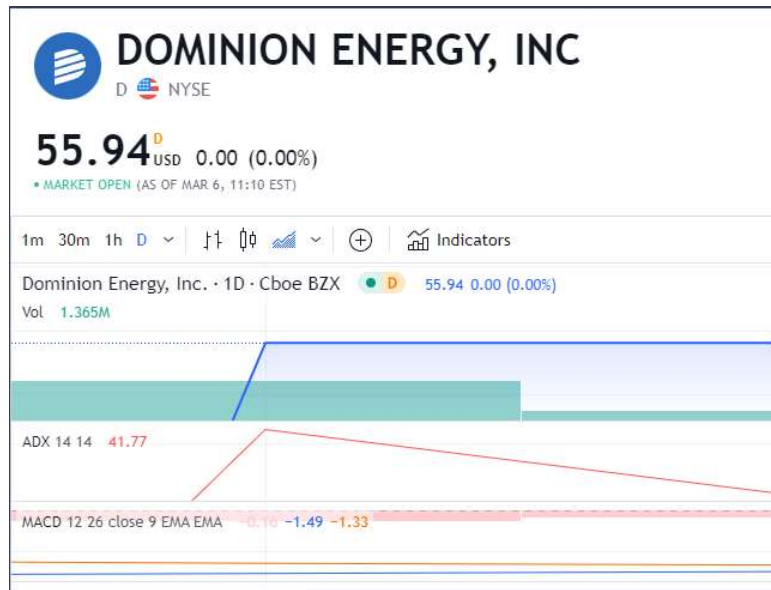
Figure 5.12 Dominion on March 6, 2023

We also bought 20 shares of JP Morgan Chase & Co. The price was increasing and with the shorter moving average being higher than the longer moving average, that is a good indication that the price of the stock would most likely continue to rise.

Figure 5.13 JP Morgan Chase & Co on March 6, 2023

On March 9th, the general indices was down again at -1.3% while our portfolio was down 0.36% since the week started. In hopes that the market would go up naturally, we decided not to sell any stock. We decided to buy 30 stocks of Google despite the decline in price because the relative strength index is decreasing and the average directional index is also decreasing. This means that

the decrease in stock value may be a weak trend and the stock is starting to become a little undervalued which indicates a good time to buy.

Figure 5.14 Google Class A on March 9, 2023

Table 5.5 Swing Trading Portfolio Transactions Week 5 (3/5-3/11)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
3/6/2023	D	Sell	55.93	200.00	11,186.00	-906.00	12,138.65	-754.07
3/6/2023	JPM	Buy	143.62	20.00	2,872.40		9,266.25	
3/6/2023	GOOGL	Buy	92.44	30.00	2,773.20		6,493.05	
3/6/2023	D	Sell	55.93	200.00	11,186.00	-906.00	12,138.65	-754.07

5.6 Week #6

On March 13, 2023, the general indices was still at a loss overall at around -3.10% for the week while our general portfolio was at around -5.86% for the week. In hopes that the market will recover, we decided that we would focus on buying rather than selling stocks. With the stock trending upwards, we bought 50 shares of Dominion Energy because the average directional index was increasing as well as having a low relative strength index.

Figure 5.15 Dominion Energy on March 13, 2023

With the general indices going up by around 1% this week, we decided to do limited selling in hopes that the stock values will increase for the last few days with the general indices increasing. Our portfolio went up around 2.89% this week which is a significant improvement from the last few weeks being down. On March 16, 2023, all the stocks were sold with an ending balance of $92,433.57.

Table 5.6 Swing Trading Portfolio Transactions Week 6 (3/12-3/18)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost / Proceeds	Profit/ Loss	Total Cash	Total Profit
3/13/2023	D	Buy	54.36	50.00	2,718.00		3,775.05	
3/16/2023	BA	Sell	203.30	25.00	5,082.50	-217.25	8,857.55	-971.32
3/16/2023	D	Sell	55.91	340.00	19,009.40	-380.50	27,866.95	-1,351.82
3/16/2023	GOOGL	Sell	100.92	249	25,129.08	981.03	52,996.03	-370.79
3/16/2023	JPM	Sell	130.65	62.00	8,100.30	-673.52	61,096.33	-1,044.31
3/16/2023	TDOC	Sell	25.38	1,341.00	34,034.58	-6,522.12	92,433.57	-7,566.43

Chapter 6: Analysis and Comparison

This simulation tested and compared two trading strategies, momentum trading and swing trading. Throughout the simulation the stock market as a whole suffered with the general indices down at around -4.3% at the end of the simulation. This affected the simulation slightly by creating more risk with trades. This led to multiple losing trades in both the swing and momentum trading. With this in mind, the trading strategies can still be accurately analyzed.

6.1 Momentum Trading Analysis

The momentum trading strategy started off with $100,000 and ended with $91,240.11. This resulted in a total loss of 8.8%. This is around double the general indices. This is seen in Figure 6.1, where the black line represents the S&P 500, the blue line represents the momentum trading portfolio.
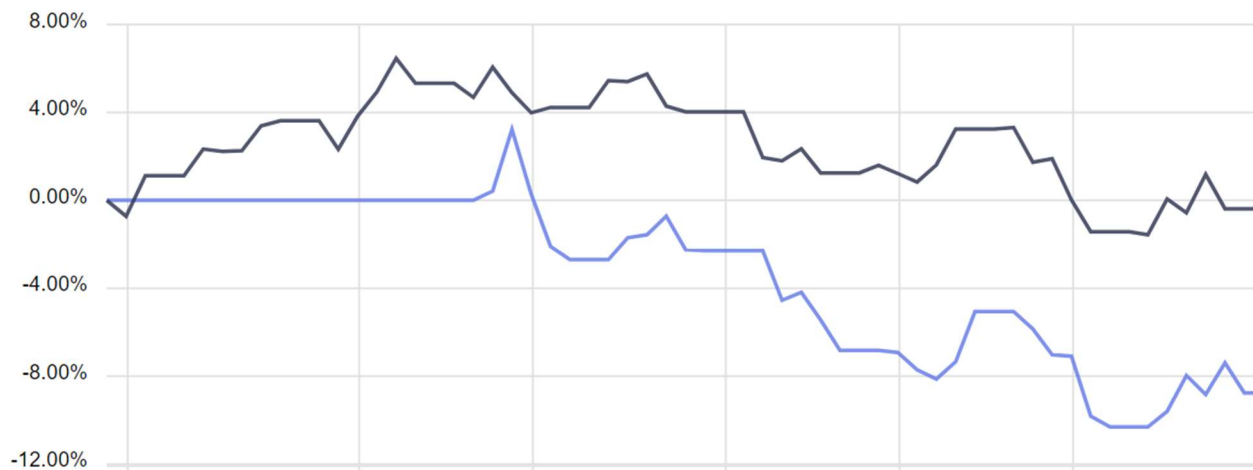

Figure 6.1 Momentum Trading compared to the S&P 500

While the graph in Figure 6.1 trends with the S&P 500, the total losses are greater which creates this separation. This can be attributed to the portfolio trading specific stocks that have greater volatility and move more up and down as compared to the general indices which are a grouping of stocks, making volatility less. The momentum trading strategy also suffered from incorrect entry

into trades, which are hard to time as these trades have to be done early and with constant monitoring of the market. This was known as a risk of momentum trading when going into the simulation. The incorrect entries are the main reason for the losses with the momentum trading portfolio. Each stock is compared in Figure 6.2 with their total profit or loss.
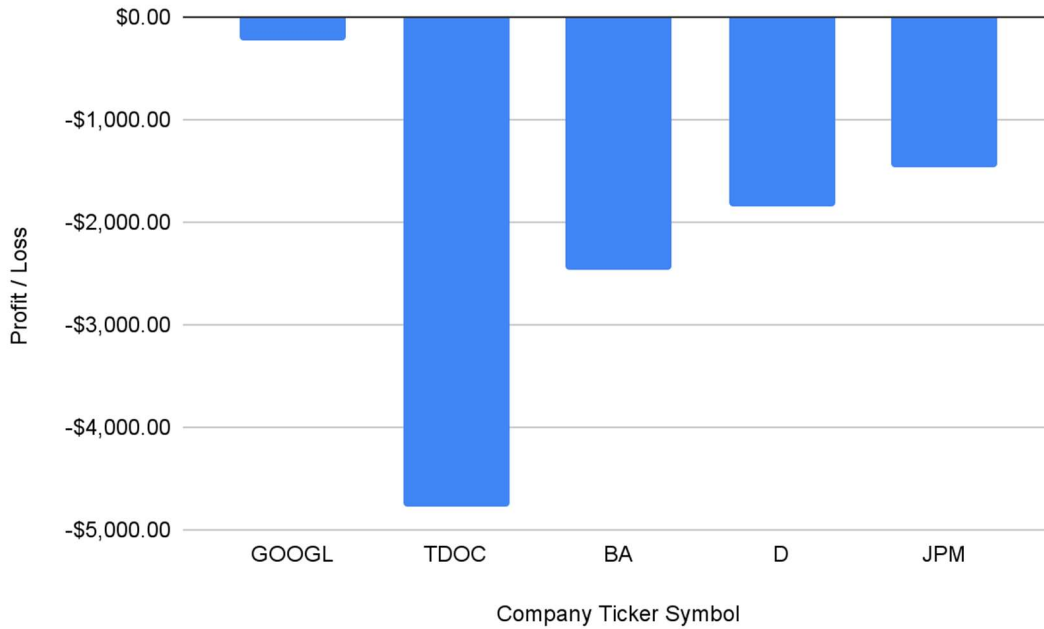

Figure 6.2 Momentum Trading Profit/Loss from individual stocks

It can be seen that TDOC was a major contributor to the loss of the momentum trading portfolio. No company made the momentum trading portfolio net profit.

6.2 Swing Trading Analysis

The swing trading strategy started off with $100,000 and ended with $92,433.57. This resulted in a total loss of 7.6%. This is a little less than double the general indices. This is seen in Figure 6.3, where the black line represents the S&P 500, the blue line represents the swing trading portfolio.
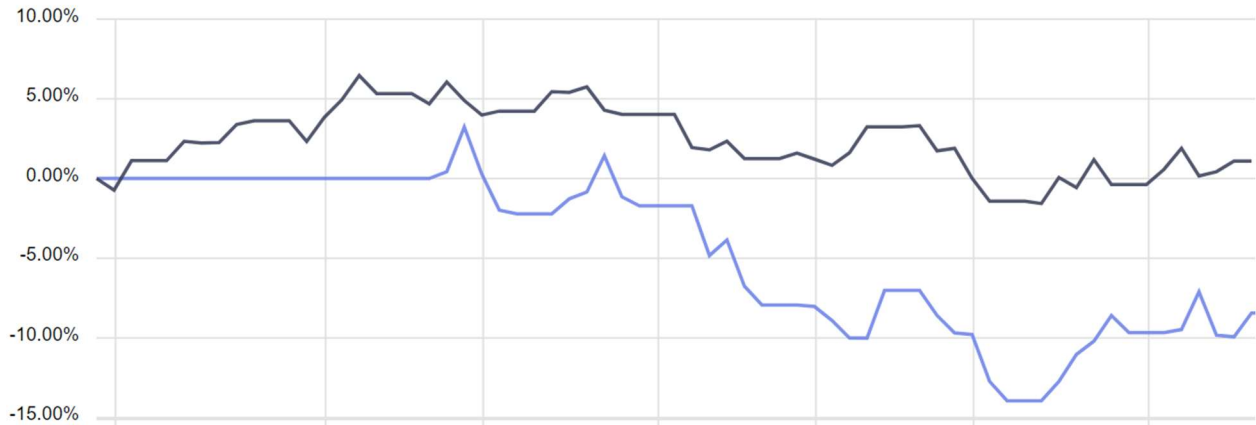
Figure 6.3 Swing Trading compared to the S&P 500

The graph in Figure 6.3 trends with the S&P 500 however, the total losses are greater which creates this separation. This can be attributed to the portfolio trading specific stocks that have greater volatility and move more up and down as compared to the general indices which are a grouping of stocks, making volatility less. The swing trading strategy suffered from being able to tell if the stock was either overvalued or undervalued. Using the indicators discussed in section 2.3, the stocks did not exactly follow the formula of showing an overvalued or undervalued stock. This meant that making a winning trade versus a losing trade was hard to decipher. Each stock is compared in Figure 6.4 with their total profit or loss.
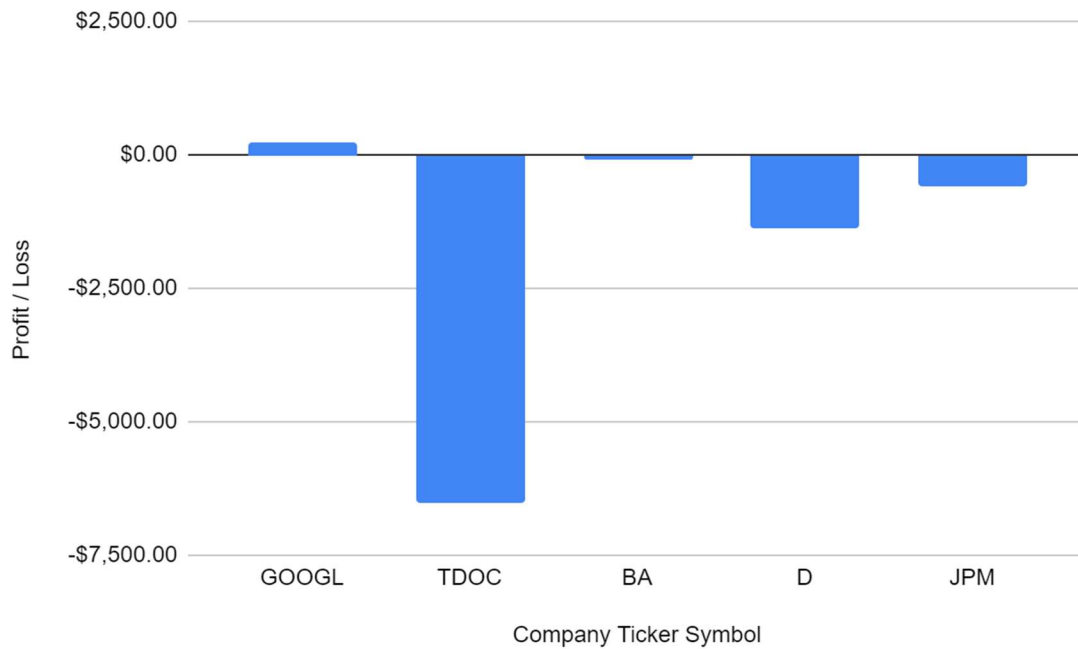
Figure 6.4 Swing Trading Profit/Loss from individual stocks

It can be seen that TDOC was a major contributor to the loss of the swing trading portfolio. Most of the other companies had very little losses in comparison to TDOC. GOOGL was the only stock to make net profit throughout the simulation.

6.3 Comparison

Overall both strategies yielded similar results. While the swing trading strategy only lost 7.6% and the momentum strategy was -8.8%, there is no data that points to one strategy being better than the other. In Figure 6.5, both strategies are compared to the S&P 500 with the black line being the S&P 500, the green line being the swing trading portfolio and the blue line being the momentum training portfolio.
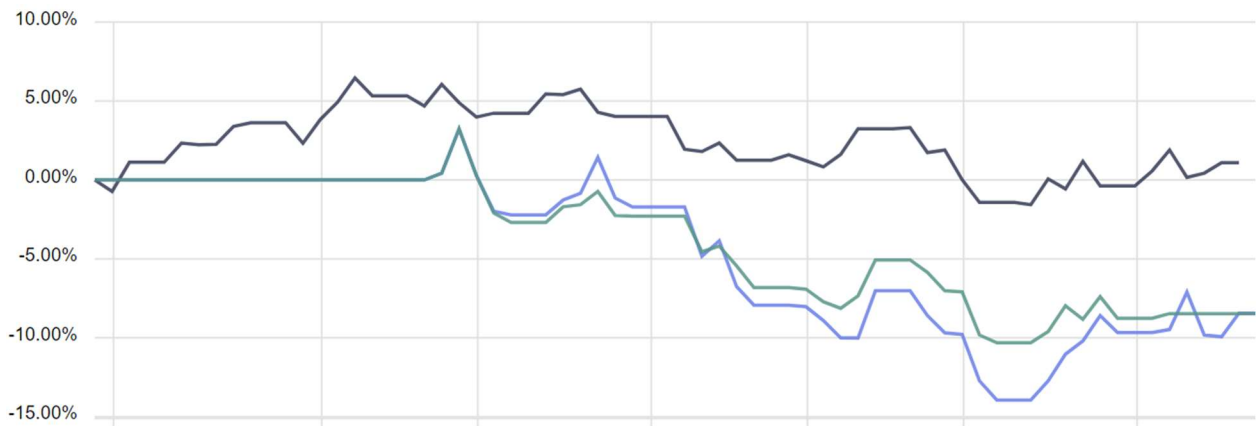
Figure 6.5 Both portfolios compared to the S&P 500

In Figure 6.5, both graphs trend the same way the S&P 500 does but both experience bigger losses due to the individual stock choices as mentioned in both section 6.1 and 6.2. It can also be seen from Figures 6.2 and 6.4 that TDOC was the stock that lost the most for both portfolios. This points to the fact that this stock choice was poor and it does not follow typical patterns. Overall both trading strategies performed very similarly with no major differences.

Chapter 7: Conclusion

Overall, the swing traded method performed a little better than the momentum trading method. However, given that the six week simulation was performed while the market was trending down, we believe that a longer simulation would have allowed the market to stabilize and could result in different results. The loss in both the momentum and swing trading portfolios was due to an unstable market with a loss under 10% for both portfolios. However, even with the losses in both portfolios, the simulation was still successful.

Over the span of the six weeks, we were able to learn how to use the stock market and what to look for when swing trading and momentum trading. We were able to strategically choose five companies to invest in, when to invest, and when to sell depending on the behavior of the stock market. Once we had enough data, we were able to analyze the data in order to help us understand the benefits and disadvantages of both trading methods as well as how to trade efficiently.

In the end, we were able to achieve our goal of becoming familiar with the stock market as well as analyze both trading methods against each other. The project was successful as our new knowledge from our analysis can help us in our future stock trading endeavors in the American stock market.

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