Stock Market Simulation

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By

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Abstract

This project is a six-week stock market simulation. The goal of this project is to gain knowledge of the stock market and its trends to be able to successfully make a profit during the simulation. This project used current and accurate numbers from the stock market to make the simulation as realistic as possible. Two trading methods were tested: the buy and hold strategy and the swing trading strategy. Stock simulations were performed with ten selected companies as portfolios and a starting investment of $100,000. Each strategy starts with an identical portfolio. The returns of the simulations – 4.7% (loss) for the Buy and Hold strategy and – 3.9% (loss) for the Swing trading strategy, respectively.   The total loss of the S and P 500 index was 3.74% over the course of the six-week simulation. The results from the simulations indicated that the Swing trading strategy using technical analysis was more profitable than the Buy and Hold strategy however neither beat the market. This project provided the participants with trading experience that will benefit them in future investments.

Acknowledgments

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Chapter 1: Introduction

1.1 Goals, Scope, and General Plan

The purpose of this IQP is to familiarize a new investor with the stock market and provide knowledge so one can become a sufficient investor. Research is a necessity and will be done throughout the first two weeks of the project. There will be a focus on background information such as the history of the stock market, as well as investment methods, analysis methods, common trends, and terminology which will allow one to form an interpretation and clear analysis of the stock market. This will allow for educated decisions when choosing to buy and sell in the stock market. Once background knowledge is obtained, six weeks will be spent collecting data using a stock market simulation. Two investment methods, the buy and hold strategy and swing trading, will be investigated using two different simulations. Each simulation will start with near-identical portfolios. This will allow for comparative analysis which will allow one to be able to see where progress is. At the end of the six weeks, the remaining three weeks of the project will be spent analyzing the results and trying to interpret the cause and effect of the successes and failures. Throughout this project, the new investor should gain the tools necessary to be a successful investor in the future.

1.2 History of the Stock Market

The first stock market appeared in Antwerp Belgium in 1531. This first exchange had no stocks but instead dealt with promissory notes and bonds. Moneylenders and brokers would meet there to deal with individual, business, and government debt issues. Though there were no real stocks, partnerships, or trade deals, overall financial work was practiced in a similar manner to what is done today.

In the 1600s, the Dutch, British, and French held their own version of a stock exchange by giving charters to companies in East India on behalf of their respective country. During the peak of imperialism, most countries had a stake in the East Indies and Asia. The exchange functioned based on the dangers of Sea Voyages. Essentially, sea voyages, which brought back goods, were at high risk of no return due to Barbary pirates, poor weather, and bad navigation. To lessen the risk of losing profit due to a lost ship, owners sought multiple investors to buy shares who, if the voyage was successful, would obtain some proceeds in exchange for covering expenses such as the ship maintenance and crew. If the voyage failed, investors faced the risks. Investors could therefore play the odds against failed voyages by investing in multiple voyages at once. Trading shares was made easy as well. All that was needed was a broker since shares were on paper. However, due to the lack of regulation for issuing these shares, many companies failed to pay their investors back [1].

In 1773, the first modern stock exchange was established in London, the London Stock Exchange (LSE). This was 19 years before the New York Stock Exchange (NYSE) was established. Due to the LSE having restrictive laws pertaining to stocks, it did not grow as much as the NYSE, which had dealt with stocks from the beginning. The lack of restrictive laws and its location on Wall Street, which is an epicenter for business and trade in the US, allowed the NYSE to dominate. Many countries made their own stock exchanges with domestic companies. These companies, once they were big enough, would progress to the LSE, and then to the NYSE [1].

1.3 Factors that Influence the Stock Market

The stock market essentially functions as an auction. When there are more buyers than sellers or vice versa, prices will adapt, and the amount of trading will fluctuate. Overall, stocks will stay relatively consistent day to day but some events in particular cause sharp increases and

decreases in stock prices. Events that influence the stock market range from natural disasters to changes in the inflation rate. Changes in the market could cause either emotionally driven decisions or calculated decisions. Either way, this can affect the price of the stock [2].

First, high economic growth, low-interest rates, and low inflation rates make the stock market more appealing. When there are signs favoring economic growth, there is more opportunity for profit due to higher demand. This will allow a company to boost dividends and stock prices. Low-interest rates and low inflation rates make stocks more attractive because the value of the stocks is increased with lower risk for investors. This helps boost economic growth and increases profits [3].

Second, the media has a huge influence on the market. If there is proof of economic stability in the media, the price of stocks will increase. However, if there is news of natural disasters, spikes in oil prices, wars and attacks, political instability, or other news relating to a decline in the economy, the stock prices tend to decrease [3].

Third, there is a bandwagon effect that plays a role in the stock market. If a stock falls, people may sell before the market has a chance to recover. Others then follow suit, lowering the stock prices even more. This also applies in a positive way. If the stock market increases and people start buying stocks, others will follow and do the same [3].

Finally, and most simply, if other related markets such as government bonds or commodities are seemingly overpriced, then the stock market will likely have more people willing to invest in it [3].

1.4 Stock Market Indices

An index is defined as a statistical way of calculating a change in an economy or market. Many indexes in the U.S. have an assortment of methods and categories that serve a broad range of purposes. Media often reports the Standard & Poor's 500 (S&P 500), the Dow Jones Industrial Average (DJIA), and the Nasdaq composite index (NASDAQ). Ultimately, indexes add meaning and clarity to a variety of investing avenues [4].

1.4.1 Standard & Poor's 500 Index

The S&P 500 index is an index with 500 of the top companies in the U.S. These stocks are chosen based primarily on capitalization. Other factors include liquidity, public float, sector classification, financial viability, and trading history. This index represents 80% of the total value of the U.S. stock market and gives a good indication of movement in the U.S. market. The S&P 500 is a market-weighted index, therefore every stock in the index is represented in proportion to the total market capitalization. If the total market value for all 500 companies in the index drops by ten percent, then the value of the index drops by ten percent [4].

S&P 500's current market value is $3,955.37, and its market summary is shown below in Figure 1.1 [5].

Figure 1.1 S&P 500 Market Summary from 1982 to 2022 [5]

1.4.2 Dow Jones Industrial Average Index

DJIA is one of the oldest, most well-known, and most frequently used indexes in the world. It includes thirty of the most influential companies in the United States. It is a price-weighted index, meaning that the percent change should not be interpreted as an indication that the entire market has dropped by that percentage. This is due to Dow's price-weighted function. This function implies that a one dollar change in one stock with a lower price will have greater significance than in a stock worth more. A change in the DJIA represents a change in investors' expected earnings and the risks of the thirty companies included in the index. Overall, this index is a good representation of nationally recognized, well-established, and financially sound companies [4].

DJIA's current market value is $31,993.99, and its market summary is shown below in Figure 1.2 [6].

Figure 1.2 DJIA Market Summary from 1982 to 2022 [6]

1.4.3 Nasdaq Composite Index

The Nasdaq is the exchange on which technology stocks are traded. The NASDAQ is a market-capitalization-weighted index of all the stocks traded on the Nasdaq stock exchange. This also includes some international companies, and some securities from other industries as well. Unlike DJIA and the S&P 500, this index includes both large and small firms as well as speculative companies. Speculative companies give a portion of their assets to high-risk investments in hopes of generating a large return. The movement of this index indicates the performance of the technology industry and investors' attitudes towards speculative stocks [4].

NASDAQ's current market value is $11,400.01, and its market summary is shown below in Figure 1.3 [7].

.IXIC · INDEX

Nasdaq Composite

11,400.01 ↑5,956.75% +11,211.79 Max

May 11, 3:23:19 PM UTC-4 · INDEXNASDAQ · Disclaimer

| 1D | 5D | 1M | 6M | YTD | 1Y | 5Y | MAX |

Figure 1.3 NASDAQ Market Summary from 1982 to 2022 [7]

1.4.4 Russell 2000 Index

Unlike the other three indexes, the Russell 2000 index is not always reported in the media. The Russell 2000 index measures the performance of the 2,000 smaller companies out of the 3000 total companies in the Russell 3000 index. It is managed by FTSE Russell and is widely regarded as a bellwether for the U.S. economy. It focuses on smaller companies, which are more prone to changes in the economy, as opposed to larger, highly profitable companies which can afford to take a hit [8].

Russell 2000's current market value is $1,733.09, and its market summary is shown below in Figure 1.4 [9].

Figure 1.4 Russell 2000 Market Summary from 1982 to 2022 [9]

1.5 Stock Market Indicators

Stock market indicators apply a statistical formula to a series of data points which conclusions can be drawn from. Often, indicators are plotted on a separate chart rather than appearing above or below an index price chart [10].

Technical indicators are pattern-based signals produced by the price, volume, and open interest of a stock. They are used by investors who follow technical analysis. It is used to evaluate investments and identify trading opportunities, by analyzing statistical trends observed involving volume and price movement from trading activity. This can be used on stocks and any security with historical trading data [11].

1.5.1 Moving Averages

In the stock market, the moving average (MA) is a stock indicator that is used in technical analysis. The MA constantly updates the average price and smooths the price data. With this calculation, short-term fluctuations in the price of a stock over a specific period are made less severe. It uses the history of stock prices to provide information and show trends for that stock. Investors can then analyze them, predict future fluctuations in the stock price, and allow them to plan their next move accordingly [12].

Below, Figure 1.5 shows a blue line representing a moving average that is located below its' corresponding stock data. The Figure also shows the MA's typical application of identifying trends and determining support levels and resistance levels. These levels are described as "two of the most highly discussed attributes of technical analysis... these terms are used by traders to refer to price levels on charts that tend to act as barriers, preventing the price of an asset from getting pushed in a certain direction" [13]. Support and resistance levels indicate price points at which the stocks' value generally does not go below or above respectively. Therefore, when a stock is approaching a potential support level, it signals a good time to buy, and when it is approaching a potential resistance level, it signals a good time to sell [14].

Figure 1.5 Moving Average [12]

There are two types of moving averages, the simple moving average (SMA), and the exponential moving average (EMA). The SMA applies equal weight to all observations in a period and the EMA puts greater value and significance on the more recent data points [15].

A moving average crossover is a technical tool that uses two different moving average lines that cross over one another. The two components needed are two moving averages. One with a data set drawing from a longer period of data and one drawing from a shorter period of data. There are two types of crossovers, the golden crossover, and the dead crossover. The golden crossover is when the short period moving average crosses the longer period moving average from the bottom-up. This is a signal to buy because the short-term MA projects a rise in stock value relative to its value in recent history, which is shown by the long-term MA. The dead crossover is the inverse. If the MA with a shorter period falls below the longer period MA, then it is a signal to sell. Figure 1.6 below shows a golden crossover relative to the data set. It is made clear that the longer period MA is more constant relative to the fluctuation of both the stock data and the shorter period MA [16].

Figure 1.6 Moving Average Crossover [16]

This indicator shown is especially useful for determining the next move for an investor. Since it provides an understanding of stock trends and predictions of future stocks, this technique allows investors to use the logic behind which stock should be bought or sold.

1.5.2 Relative Strength Index

The relative strength index (RSI) is a momentum indicator that is used in technical analysis. It measures the magnitude of recent price changes to evaluate overbought or oversold conditions in the price of a stock or other assets. The indicator goes on an oscillating scale from zero to one hundred. Thirty is considered an oversold reading or undervalued stock while seventy is considered an overbought reading or overvalued stock. When the reading is below thirty it is a good time to buy since this analysis method predicts that the stock price will soon be raised. When the reading is above seventy it is a good time to sell because RSI predicts that there will be a drop in price or a corrective pullback price. Figure 1.7 shows an RSI and examples of overbought and oversold conditions located below the stocks' data [17].

Figure 1.7 Relative Strength Index [17]

This decision tool is good for knowing when to sell and how long to hold on to stocks before selling. The general rule of the stock market is to buy when the stock is low and sell when it is high. Therefore, buy below thirty percent and sell above seventy percent on the RSI scale. It will also allow an investor to increase their confidence when there is an upward trend in stock prices to assure that the investor will not sell too early.

1.6 Recent History of the Stock Market

The stock market has evolved into something very complex and difficult to understand without background research and knowledge of current events happening within the U.S. and around the world. The addition of the media allows the world to know the new headlines almost immediately, this provides a new element that must be taken into consideration. These events affect the stock market daily and are necessary to know to be able to make a profit.

First, since the beginning of the COVID-19 pandemic in 2020, updates on new variants, spikes in cases, vaccines, and other related news have not left the media. Though the stock decline from the initial lockdown has since recovered, there are still lasting effects from new developments due to humanity now living alongside the virus. Due to the COVID-19 spike in China in 2022, they are implementing harsh rules to fight it. Shanghai has been in lockdown for over a month. This closes ports and factories not only in Shanghai but in other major cities in China. Moreover, this causes consequences to the supply chain such as higher fuel prices, slower manufacturing, and delays in deliveries to other countries, hurting the economy and lowering stocks of unnecessary items [18].

Second, the market has been under a lot of pressure because the U.S. is dealing with the highest inflation levels experienced in about forty years. Prices are raised everywhere and are persisting in the U.S. and the global economy. The inflation in the U.S. has been caused by a supply chain disruption due to the pandemic, decreased output of goods due to lack of consumer interest, an all-around shortage of supplies, and government-sponsored unemployment. People are both concerned with inflation itself and are unsure about the Federal Reserves' ability to fix it. Therefore, with the increased inflation, stock value is decreasing [19].

Finally, Russia's invasion of Ukraine has impacted companies that are present there and products that are exported from there. This puts pressure on market prices. Energy, grains, and metal prices especially, have dramatically increased. This is due to trade restrictions imposed on the U.S. and the lack of production capable of being done in Ukraine. Because of the lack of necessary products coming into the U.S. from Ukraine, this leads to an increase in demand which results in an increase in specific stock prices [20].

Chapter 2: Methodology

2.1 Stock Market Simulation Platform

With the diversity in stocks, the constant fluctuations, and the overall complexities, the stock market is overwhelming to most. With no practice, people are at considerable risk of losing a substantial amount of money before learning how to maneuver the market at all. With the commission fee trading platforms require, a simulation is the safer alternative when first learning about the stock market. There are many stock market simulations online today. With a simple google search, many results are shown from companies such as Thinkorswim by TD Ameritrade, Moomoo, and Warrior Trading. These can be used to track the progress of stock portfolios which are subject to multiple trading strategies. These simulators use paper trading, which allows new investors to simulate the stock market experience by using fake cash to buy stocks. This inclines beginners to take greater chances and therefore learn from their mistakes, to help them improve upon identifying chart patterns and trends with no real risk [21].

The desirable criteria in a stock market simulation were one that had similar functions to that of the real market, one that was pulled from current data in the stock market, and one that could create a portfolio to manage stocks. Investopedia's stock market simulator had all the stated qualities and was therefore the best fit. Investopedia uses both current and historical data for analysis of the stock market which enhances the experience for the user. It also provides extensive educational material that can be used as a guide to the stock market. In addition to this, Investopedia also has a feature that will allow one to buy and sell stocks outside of open hours and will base price judgment on the closing price of the stock. This is similar to after-hours trading of the real market [22].

Investopedia uses a game format to run the simulation. It gives each player $100,000 to create a portfolio and invest in different stocks. Based on today's market the game will adjust the price of stocks accordingly. There are five tabs across the top labeled portfolio, trade, research, learn, and game. Each tab represents a different aspect of the stock market [23].

First, the portfolio tab allows one to view their stocks, that day's earnings, their annual returns, and their performance history over different periods. Figure 2.1 below shows what the portfolio page looks like. The upper right graph shows different periods of time where the investor can track data on specific stocks. On the left investors can see their earnings and account value. And below both these features, they can see the companies they have invested in.
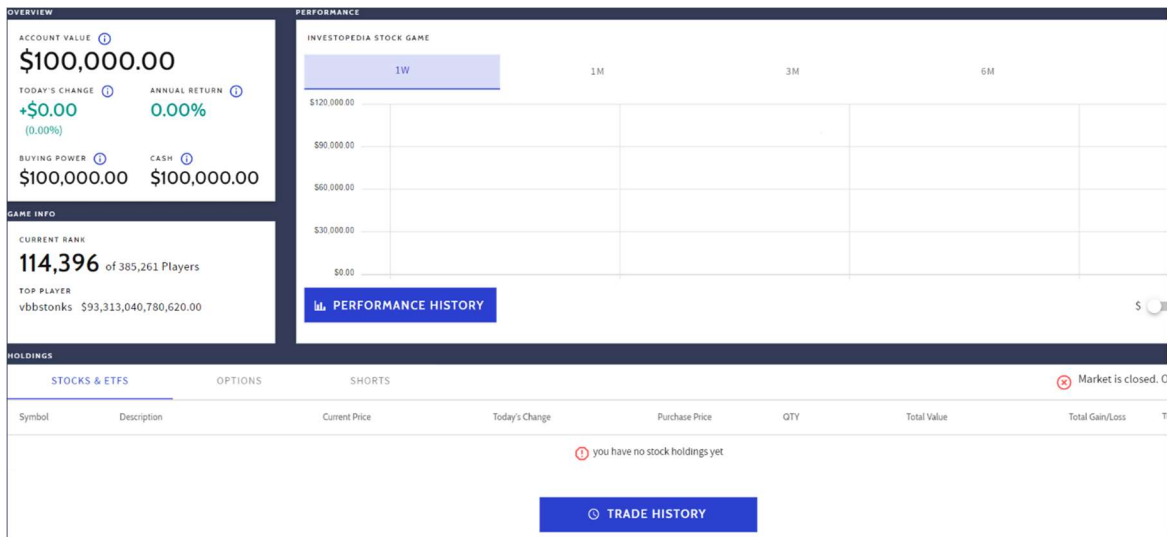
Figure 2.1 Portfolio Page of the Stock Market Simulator [23]

Second, the trade tab is where one can buy and sell stocks. One simply looks up the symbol of that stock and then picks the action of buy or sell, the number of stocks, and the duration. The duration feature allows for trades to occur after market hours.

Third, is the research tab. This is an especially helpful feature of this simulation because it helps determine when to buy and sell stocks. There are many indicators to choose from, and

different indexes to filter through to give the most information possible to logically make the next decision [24].

Below, Figure 2.2 shows the research page of Investopedia's simulator. The most traded stocks are listed at the top, followed by other stocks with analytical statistics listed below. When the filter tab is clicked, more information is accessible such as technical analysis tools.
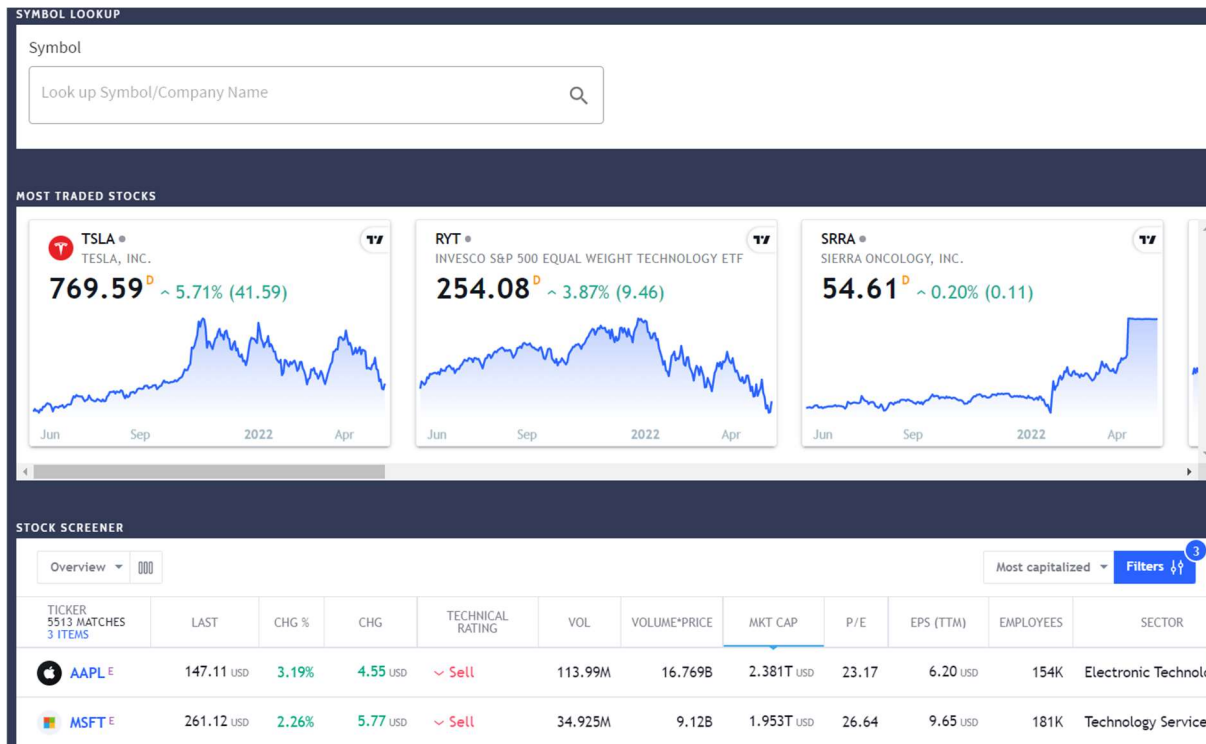
Figure 2.2 Research Page of the Stock Market Simulator [23]

Next, the learning page gives essential how-to tutorials on the basics of the stock market. How to buy and sell stocks, the basics of when to sell, what short-term selling versus long-term is, and other valuable information is included [24].

Finally, the games tab puts your progress against others who are using the same simulation. The investor can play games against others using the simulator. They can also join or create games

with others to check their progress. This gives the investor added information through comparative analysis to grasp a complete idea of how one is truly doing in the stock market [23].

2.2 Buy and Hold Strategy

The buy and hold strategy is one of the simplest strategies and is great for long-term investments. Buy and hold does not require observation of day-to-day fluctuations in the market. This is a passive strategy, meaning investors keep a stable portfolio over a longer period despite the state of the stock market [25]

As shown previously in chapter 1, the overall trend of each index is upward. This does not account for every stock available, but in generalized cases it does. Though there are some sharp declines, especially recent, the market has always recovered. The logic is then, since the market always seems to recover, if one buys a stock and keeps it for multiple years there will eventually be a profit. Some benefits are that there is a lower quantity of transactions required and therefore lower brokerage and advisory fees, the tax rate is lower on long-term capital gain, and it is easy to adopt and use. There are some downfalls to this strategy, however. People who use this strategy need to have a high-risk tolerance as they will watch their stock rise and fall multiple times before it is time to sell. One needs to have the patience to profit from this type of strategy. There is also no limit to the potential losses if any severely negative event occurs to either the stock market or that specific stock itself [26].

Figure 2.3 below shows a stock from General Electric Company. It has declined within the past five years and has not recovered. There are many stocks that follow a similar trend to the indexes shown in chapter one and make a profit within this time. This is an example, however, of a stock where one will experience the risks of the buy and hold strategy.
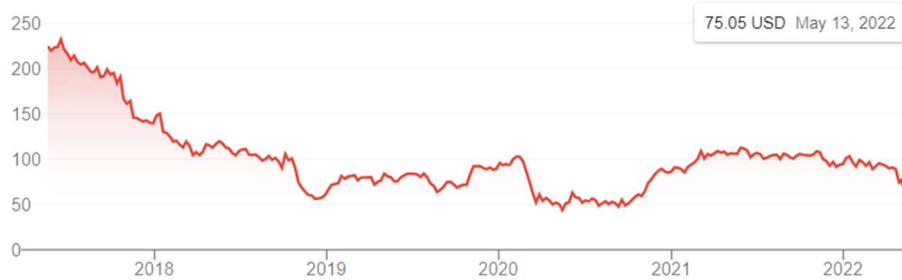
Figure 2.3 Failed Buy and Hold Strategy Example [27]

Since this experiment will be held for six weeks, there is not enough time to see the long-term benefits of this strategy. However, it will be a good control to see how the second strategy, the swing trading strategy, performs relative to this one. Analysis of this strategy will be done at the end of the period and will use comparative analysis to identify its successes and failures because there will be only one buying period and one selling period.

2.3 Swing Trading Strategy

The swing trading strategy is a short-term active investing strategy. Active investing refers to trading more frequently and opportunistically based on the fluctuations of the market. Stock traders tend to use technical analysis indicators to anticipate where the market is and where the market is projected to go to then benefit from this strategy [28].

Swing traders hold stocks for longer than one day as opposed to day trading which normally holds on to stocks for a few hours. Swing trading uses stable stocks which accumulate profit over time as opposed to day trading, which has the goal of creating a smaller profit with a more volatile

stock in a brief period. The swing trade strategy forces one to commit to the daily ups and downs of the stock price until indicated a good time to sell. When one sticks to a proper analysis plan, they will be able to make a profit [29].

Since this strategy requires one to hold on to a stock for multiple days, the most opportune stocks would be higher-priced stocks that are trending upward with little daily movement. The technical analysis tool that is commonly used in swing trading is support and resistance levels. These imply upward and downward trends. Moving averages of different periods will be used to create a smooth data line that can then identify support and resistance levels. From there knowing when to buy and sell these stocks will become clear. The crossover method will be used as well as a second indicator. Because moving averages will already be found, finding golden and dead crossovers is another tool that will be used to determine when trading stocks should occur [29].

Below, Figure 2.4 shows potential support and resistance levels which are areas that can make a profit. The green bars show an increase in stock price and imply the stock is approaching a resistance level, and the red bars show a decrease in stock price and imply the stock is approaching a support level. If one buys at a potential support level and sells at a potential resistance level, there is an opportunity to make a profit.

Figure 2.4 Swing Trading Opportunity Using Resistance and Support Levels [30]

In addition to analyzing moving averages, the relative strength index will also be used. Identifying oversold and overbought readings in the RSI oscillating scale will be used as another check to coincide with support and resistance level predictions and moving average crossovers. When there is an oversold reading coinciding with the first method of analysis, whether that is a support level prediction or a golden cross over occurs, it is a sign to buy, and vice versa with the opposite conditions.

Chapter 3: Companies

To make the best decision on which companies to pick from, a recap of the previous chapters and a discussion on the insight they provide is a proper starting point. Currently, in the U.S., there is extremely high inflation and high-interest rates on stocks. Therefore, stocks, in general, are losing value and have a higher risk when investing in them. Also due to problems with the supply chain from both embargos derived from the Russia and Ukraine war, and China's newest lockdown, supply is limited making demand much higher. This accumulated with medias' constant updates on the poor state of the U.S. economy led to a significant decrease in the stock market during the past few months.

The definition of a recession is a period of temporary economic decline during which trade and industrial activity are reduced. There are many news articles that dispute whether the U.S. is heading into a recession, when it will exactly be, and how long it will last. Though there are many uncertainties it is made clear that within the six weeks of this experiment a vast improvement in the market is unlikely. Therefore, it will be optimal to invest in necessities, products that people are reliant on and cannot afford to stop using. This, along with diversifying the portfolio will give the best chance of success in today's stock market. Due to the state of the economy and the media increasing people's worry, products that are not necessary will have a decrease in stock value and necessary products will increase. The stocks will start at a high price but should theoretically continue to grow as the increase in demand and limit in supply continues. Demand for luxury items will therefore only drop-in products, hence decreasing their stock value [31].

3.1 Healthcare

Healthcare stocks tend to be relatively immune to a severe decline in stocks. People cannot put off needed medical treatments and necessary appointments. Therefore, the two companies that will be picked to capitalize on this will be CVS Pharmacy and Walgreens. Since both are drug stores and retail pharmacies, they attract people with similar demands. This will be used as a comparison to see if one is more successful than the other, and if this is true, an investigation will take place to find why they may differ. Below Figures 3.1 and 3.2 show the stock prices of CVS and Walgreens respectively over the past year [32].

Figure 3.1 CVS Stock Price Over the Past Year [33]

Figure 3.2 Walgreens Stock Price Over the Past Year [34]

3.2 Consumable Essentials

When prices of everyday products and services rise, consumers tend to shift their habits, specifically eating habits, from dining in restaurants to making food at home. Grocery stores and packaged food makers will therefore be relatively safe when the economy is in a decline. Because of this, Kroger will be picked as a company to invest in. Kroger will be used because it is one of the largest supermarkets by revenue in the world. Below in Figure 3.3 is the price of stocks from Kroger over the past year [32].

Figure 3.3 Kroger Stock Price Over the Past Year [35]

PepsiCo will also be used for similar reasoning. Since this company has many well-known brands such as Pepsi, Tropicana, Quaker Oats, and Aquafina, all which line grocery shelves, it is likely that the demand for these products will stay high even if the prices increase and supply is lessened. Below in Figure 3.4 is the price of stocks from PepsiCo. over the past year [32].

Figure 3.4 PepsiCo. Stock Price Over the Past Year [36]

3.3 Utilities

Demand for electricity, water, waste collection, and natural gas will all remain relatively stable despite stock market declines. This is a necessary service people need in today's world because of America's urbanized culture. American Water Works, Williams Companies Incorporated, and imperial oil will be picked to observe the wastewater, natural gas, and oil stocks respectively [32].

American Water Works is the nation's leading water and wastewater utility company. They produce steady earnings and are supported by government-regulated rates. They also have shown

themselves to generate stable revenue despite economic standing. Figure 3.5 below shows American Water Works' stock price over the past year [32].

Figure 3.5 American Water Works Stock Price Over the Past Year [37]

The Williams Companies Inc. is also a major presence in the utility realm. Specifically in natural gas. It operates critical pipelines that move gas and other energy commodities from production to market centers. It is backed by long-term contracts and has generated a stable cash flow throughout its history. Below in Figure 3.6 is the stocks over the past year of Williams Companies Incorporated [32].

Figure 3.6 Williams Companies Inc. Stock Price Over the Past Year [38]

The final utility, oil, will be investigated by observing the stock prices of Imperial Oil. Due to the current high price per barrel, and the U.S. dependence on oil it shows there is a high demand and low supply, similar to the other utilities mentioned. This implies that the stock prices of oil will continue to increase. Below in Figure 3.7 is the stock price of Imperial Oil over the past year [32].

Figure 3.7 Imperial Oil Stock Price Over the Past Year [39]

3.4 Cost-Conscious Retail

When the economy is in a decline people shift their spending habits to be more conservating with lower-priced items. They also typically stop spending on optional expenses such as paying professionals to do routine maintenance. There will be more do-it-yourself home improvement motivation, hence more spending will be at home improvement outlets, discount retailers, and auto part stores. Because of this, Amazon, and Home Depot will also be companies that will be invested. Below in Figures 3.7 and 3.8 are the past year's stock prices of Amazon and Home Depot respectively [32].

Figure 3.8 Amazon Stock Price Over the Past Year [40]
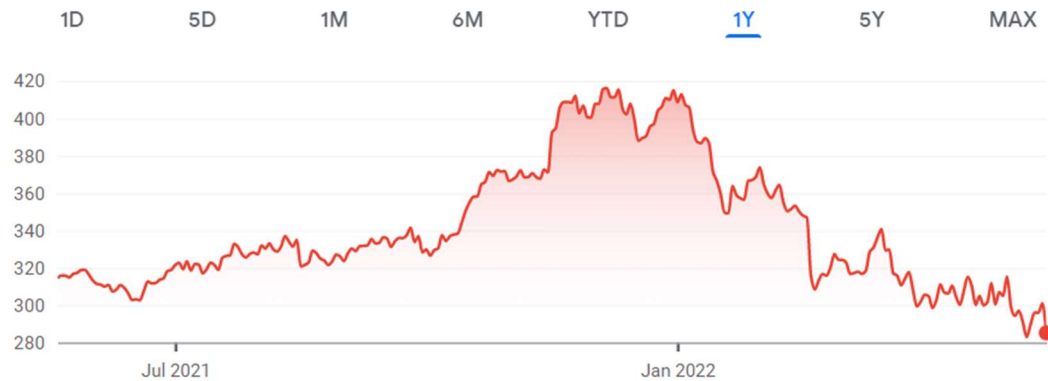
Figure 3.9 Home Depot Inc Stock Price Over the Past Year [41]

3.5 Travel

Predictions from the beginning of the year to now have dramatically changed. But one thing that has been constant is the progress made with the COVID-19 pandemic. Since vaccines are now readily available to the public, and according to the Mayo Clinic about 60% of Americans are now fully vaccinated, despite new strains, life is expected to somewhat return to normal. This means that traveling was predicted to be a huge market at the beginning of 2022, and therefore the stocks should be profitable because there is high demand for it. Though, with the current economy not being in the state most predicted in January of 2022, including a travel company in my portfolio will be used as a comparison to these predictions and to diversify the portfolio. Therefore, the final company in my portfolio will be Delta Air Lines Incorporated [42].

Below in Figure 3.10 is the stock price of Delta Air Lines Inc.

Figure 3.10 Delta Air Lines Inc Stock Price Over the Past Year [43]

The ten companies in my portfolios will be CVS Health, Walgreens Boots Alliance Inc, Kroger Company, PepsiCo, American Water Works Company, Williams Companies, Imperial Oil, Amazon.com, Home Depot, and Delta Air Lines.

Chapter 4: Buy and Hold Simulation

The buy and hold strategy started with purchasing stocks from all companies mentioned in chapter three. Each company had between $8,300 and $10,100 worth of each stock to start and the total initial investment amongst all stocks was $94,976.35. This left about $5,000 sitting in cash in case there were unforeseen circumstances that arose within the six-week simulation.

The investments that followed the initial purchase were made when the market was closed for consistency. Therefore, all purchases were be based on the closing value from the prior day to remove as much variability as possible. This allowed for a better comparison between the buy and hold strategy and the swing trading strategy, rather than showing the successes and failures of buying or selling at different peaks and lows during the day.

This buy and hold strategy used Friday's closing price each week as a "selling" price. This is done for asset value and profit calculations from week to week. At the start of next week, the same stocks will be rebought at the same price as they were "sold" at the end of the prior week and held until the market closes on Friday when the stocks will be sold again.

4.1 Week One (5/21-5/27)

On Monday, May 23rd, 2022, all initial stocks for the buy and hold portfolio were bought. No other trades were made throughout the rest of that week following the plan this strategy entails. Below is Figure 4.1 from the portfolio tab on the simulation at the end of the day for this strategy.

Figure 4.1 Starting Portfolio for the Buy and Hold Strategy at the End of Day 1 [23]

All transactions were made at the end of the week based on Friday's selling price. Below is Table 4.1. This is where all transactions from Week One are displayed from the buy and hold portfolio. Also shown are the total profit and total cash present in the portfolio. As mentioned above, the "sell" price in the table represents the closing price of Friday, May 27th, for calculation and monitoring purposes, and the same price will be used to rebuy the same stocks the next week.

Table 4.1 Buy and Hold Portfolio Transactions Week 1 (5/21 – 5/27)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
5/21/2022							$100,000	
5/23/2022	CVS	Buy	$95.69	100	$9,569	0	$90,431	0
5/23/2022	WBA	Buy	$41.68	240	$10,003.20	0	$80,427.80	0
5/23/2022	KR	Buy	$49.14	200	$9,828.00	0	$70,599.80	0
5/23/2022	PEP	Buy	$165.00	60	$9,900.00	0	$60,699.80	0
5/23/2022	AWK	Buy	$148.03	60	$8,881.80	0	$51,818.00	0
5/23/2022	WMB	Buy	$35.89	275	$9,869.75	0	$41,948.25	0
5/23/2022	IMO	Buy	$53.30	180	$9,594.23	0	$32,354.02	0
5/23/2022	AMZN	Buy	$2,095.31	4	$8,381.25	0	$23,972.77	0
5/23/2022	HD	Buy	$282.22	33	$9,313.26	0	$14,659.51	0
5/23/2022	DAL	Buy	$39.33	245	$9,635.85	0	$5,023.65	0
5/27/2022	CVS	Sell	$98.05	100	$9,805	$236	$14,828.65	$236
5/27/2022	WBA	Sell	$43.71	240	$10,490.40	$487.20	$25,319.05	$723.20
5/27/2022	KR	Sell	$52.96	200	$10,592.00	$764.00	$35,911.05	$1,487.20
5/27/2022	PEP	Sell	$171.77	60	$10,306.20	$406.20	$46,217.25	$1,893.40
5/27/2022	AWK	Sell	$151.76	60	$9,105.60	$223.80	$55,322.85	$2,117.20
5/27/2022	WMB	Sell	$37.46	275	$10,301.50	$431.75	$65,624.35	$2,548.95
5/27/2022	IMO	Sell	$55.91	180	$10,063.80	$469.57	$75,688.15	$3,018.52
5/27/2022	AMZN	Sell	$2,302.93	4	$9,211.72	$830.47	$84,899.87	$3,848.98
5/27/2022	HD	Sell	$308.46	33	$10,179.18	$865.92	$95,079.05	$4,714.90
5/27/2022	DAL	Sell	$42.23	245	$10,346.35	$710.50	$105,425.40	$5,425.40

It is shown that $5,398.65 was made in profit and that the market overall improved this week, hence value of assets increased and a profit was made. Figure 4.2 below shows the graph of the overall performance of the buy and hold portfolio during Week One.
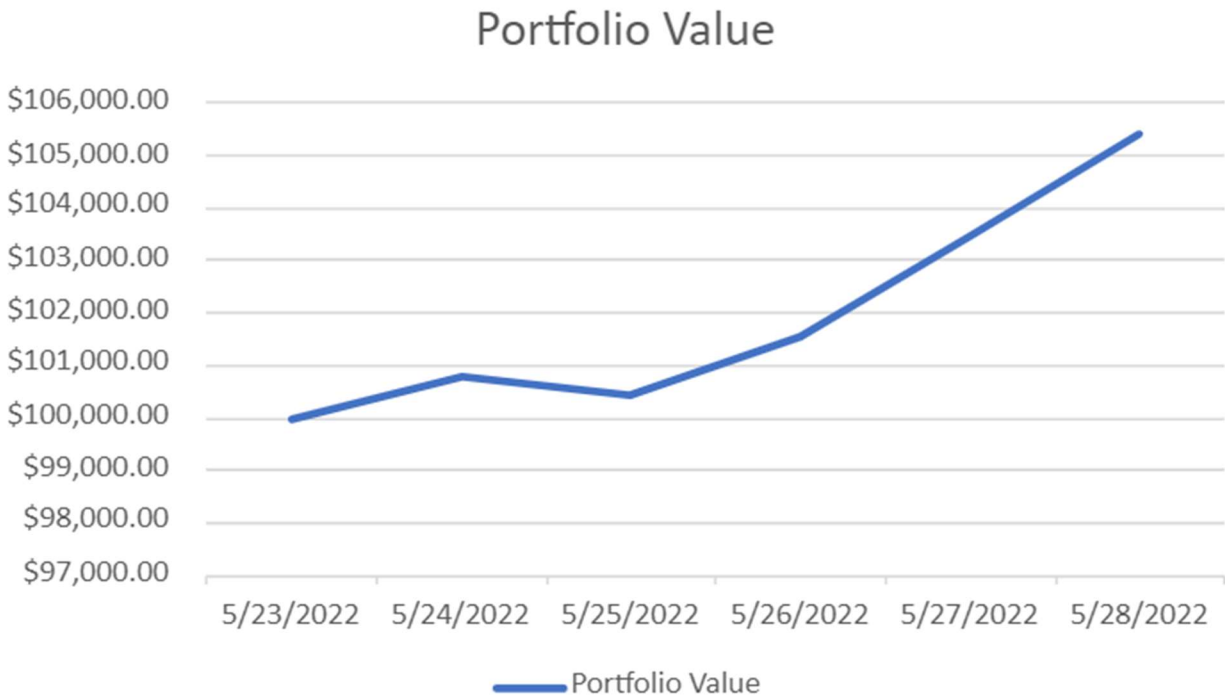
Figure 4.2 Buy and Hold Overall Performance Week 1 2022

4.2 Week Two (5/28-6/3)

During the second week of the simulation, Memorial Day was observed. This made it so the stock market was only open four days instead of five. On Tuesday, May 31st, 2022, the day after Memorial Day, the stock market reopened, and all initial stocks were bought at the price of closing value from the week prior. These stocks were then held for the rest of the week until the market closed on Friday, May 3rd. Table 4.2 below shows the transactions made during the second week of the simulation in the buy and hold portfolio. Like the prior week, the "sell" price is the closing price from Friday and is used for monitoring purposes. The stocks will then be rebought the next week for the same price as it was sold.

Table 4.2 Buy and Hold Portfolio Transactions Week 2 (5/28 – 6/3)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
5/31/2022	CVS	Buy	$98.05	100	$9,805.00	0	$95,620.40	$5,425.40
5/31/2022	WBA	Buy	$43.71	240	$10,490.40	0	$85,130.00	$5,425.40
5/31/2022	KR	Buy	$52.96	200	$10,592.00	0	$74,538.00	$5,425.40
5/31/2022	PEP	Buy	$171.77	60	$10,306.20	0	$64,231.80	$5,425.40
5/31/2022	AWK	Buy	$151.76	60	$9,105.60	0	$55,126.20	$5,425.40
5/31/2022	WMB	Buy	$37.46	275	$10,301.50	0	$44,824.70	$5,425.40
5/31/2022	IMO	Buy	$55.91	180	$10,063.80	0	$34,760.90	$5,425.40
5/31/2022	AMZN	Buy	$2,302.93	4	$9,211.72	0	$25,549.18	$5,425.40
5/31/2022	HD	Buy	$308.46	33	$10,179.18	0	$15,370.00	$5,425.40
5/31/2022	DAL	Buy	$42.23	245	$10,346.35	0	$5,023.65	$5,425.40
6/3/2022	CVS	Sell	$94.90	100	$9,490.00	($315.00)	$14,513.65	$5,110.40
6/3/2022	WBA	Sell	$43.14	240	$10,353.60	($136.80)	$24,867.25	$4,973.60
6/3/2022	KR	Sell	$52.54	200	$10,508.00	($84.00)	$35,375.25	$4,889.60
6/3/2022	PEP	Sell	$164.85	60	$9,891.00	($415.20)	$45,266.25	$4,474.40
6/3/2022	AWK	Sell	$155.15	60	$9,309.00	$203.40	$54,575.25	$4,677.80
6/3/2022	WMB	Sell	$37.51	275	$10,315.25	$13.75	$64,890.50	$4,691.55
6/3/2022	IMO	Sell	$55.42	180	$9,975.60	($88.20)	$74,866.10	$4,603.35
6/3/2022	AMZN	Sell	$2,447.00	4	$9,788.00	$576.28	$84,654.10	$5,179.63
6/3/2022	HD	Sell	$305.08	33	$10,067.64	($111.54)	$94,721.74	$5,068.09
6/3/2022	DAL	Sell	$38.54	245	$9,442.30	($904.05)	$104,164.04	$4,164.04

Stocks were down by the end of the week. Red values in the "Profit/Loss" column in Table 4.2 signifies a loss in profit. The overall loss in stock value from Week One to Week Two was $1,261.36. This is a 23.2% loss in total profit from last week. Below, Figure 4.3 shows the fluctuations in stock value for the overall portfolio for the week and the portfolio's value.

Figure 4.3 Buy and Hold Overall Performance Week 2

Overall, most stocks were down, and without the ability to buy and sell based on indicators, most stocks lost value due to the stock market declining.

4.3 Week Three (6/4-6/10)

During Week Three of the simulation, the stock market was open for the full five days of the week. The S and P index had an incline in price at the beginning of the week, then sharply dropped by Friday, June 10th. Overall, in the buy and hold simulation, like the S and P 500 index this week, all stock prices dropped in value, resulting in a loss of money by the end of the week.

Below in Table 4.3, it is apparent that the stock market, in general, is declining this week. Like the last few weeks of this simulation, all shares were bought based on the closing price from the week prior on June 6th and then sold at the closing price on Friday, June 10th. This is done for calculation and monitoring purposes. The red numbers in parentheses imply a net loss in profit when all shares were sold.

Table 4.3 Buy and Hold Portfolio Transactions Week 3 (6/4-6/10)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
6/6/2022	CVS	Buy	$94.90	100	$9,490.00	0	$94,674.04	$4,164.04
6/6/2022	WBA	Buy	$43.14	240	$10,353.60	0	$84,320.44	$4,164.04
6/6/2022	KR	Buy	$52.54	200	$10,508.00	0	$73,812.44	$4,164.04
6/6/2022	PEP	Buy	$164.85	60	$9,891.00	0	$63,921.44	$4,164.04
6/6/2022	AWK	Buy	$155.15	60	$9,309.00	0	$54,612.44	$4,164.04
6/6/2022	WMB	Buy	$37.51	275	$10,315.25	0	$44,297.19	$4,164.04
6/6/2022	IMO	Buy	$55.42	180	$9,975.60	0	$34,321.59	$4,164.04
6/6/2022	AMZN	Buy	$2,447.00	4	$9,788.00	0	$24,533.59	$4,164.04
6/6/2022	HD	Buy	$305.08	33	$10,067.64	0	$14,465.95	$4,164.04
6/6/2022	DAL	Buy	$38.54	245	$9,442.30	0	$5,023.65	$4,164.04
6/10/2022	CVS	Sell	$93.17	100	$9,317.00	($173.00)	$14,340.65	$3,991.04
6/10/2022	WBA	Sell	$41.54	240	$9,969.60	($384.00)	$24,310.25	$3,607.04
6/10/2022	KR	Sell	$51.09	200	$10,218.00	($290.00)	$34,528.25	$3,317.04
6/10/2022	PEP	Sell	$162.52	60	$9,751.20	($139.80)	$44,279.45	$3,177.24
6/10/2022	AWK	Sell	$148.27	60	$8,896.20	($412.80)	$53,175.65	$2,764.44
6/10/2022	WMB	Sell	$34.89	275	$9,594.75	($720.50)	$62,770.40	$2,043.94
6/10/2022	IMO	Sell	$54.16	180	$9,748.80	($226.80)	$72,519.20	$1,817.14
6/10/2022	AMZN	Sell	$109.65	80	$8,772.00	($1,016.00)	$81,291.20	$801.14
6/10/2022	HD	Sell	$289.24	33	$9,544.92	($522.72)	$90,836.12	$278.42
6/10/2022	DAL	Sell	$35.12	245	$8,604.40	($837.90)	$99,440.52	($559.48)

For the first time in this simulation, this portfolio has ended in negative total profit, leaving the overall value of stocks at $99,440.52. This is $559.48 below the starting value. As shown in

the "Profit/Loss" column, it is apparent that all stocks in the portfolio dropped in value relative to their prices last week. The overall loss from last week is $4,723.52 which is nearly four times the amount of profit loss between Week One and Week Two.

Below, Figure 4.4 shows the fluctuations in stock value for the overall portfolio for the week and the portfolio's value.
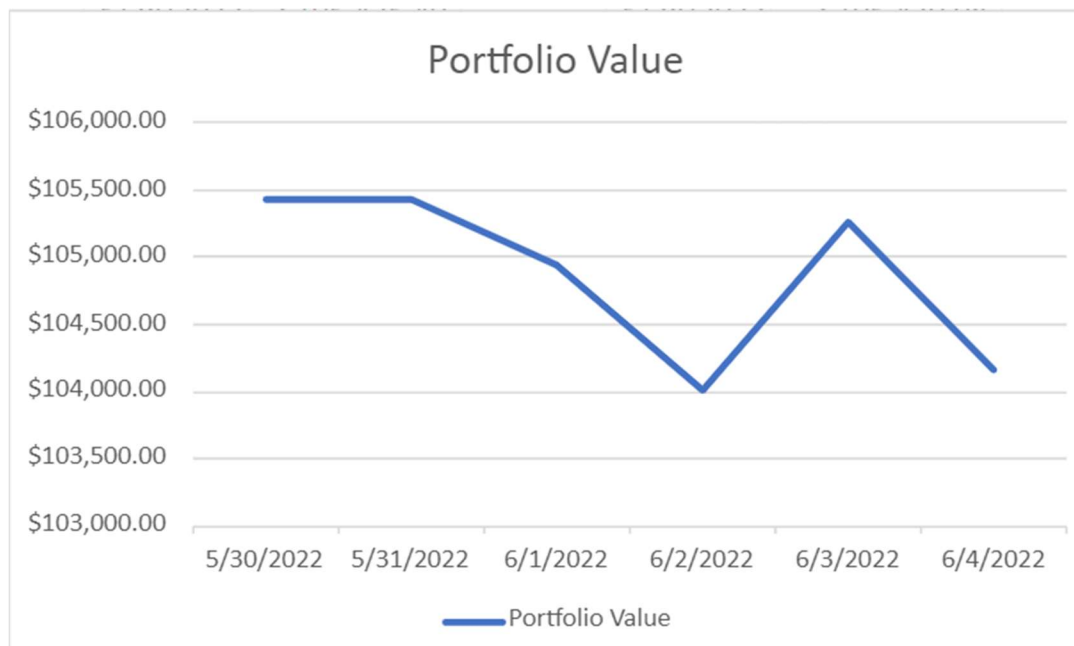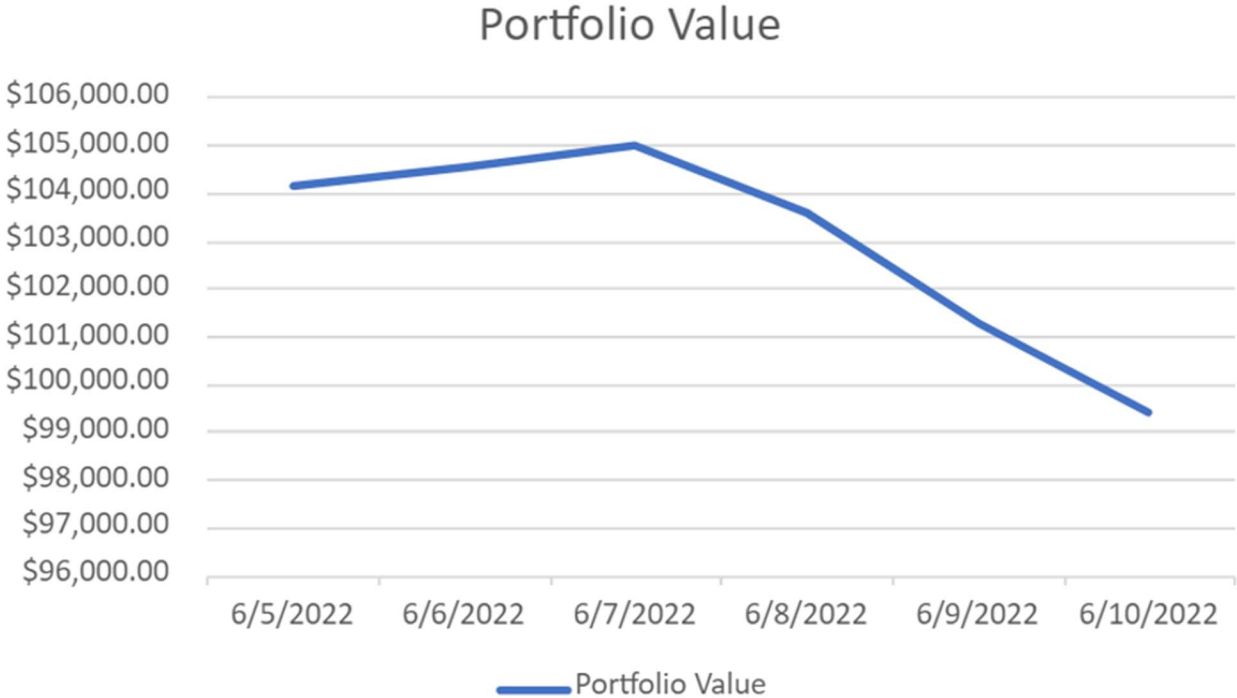

Figure 4.4 Buy and Hold Overall Performance Week 3

The Amazon stock was a major contributor to the decline in stock value this week due to the stock split. The Amazon stock split 20-for-1 on Monday, June 6th. Though there is normally a brief high in stock price due to this event, the Amazon stock lost value throughout the week. Based on analysis of the RSI, the Amazon shares, once the split occurred, appeared to be close to the overbought condition and the price then decreased accordingly [44].

Figure 4.5 below shows the Amazon stock and its fluctuations throughout the past week.

Figure 4.5 Amazon Stock on June 10th, 2022 [23]

It is shown that the RSI and stock value both greatly decreased after the stock split on June 6th.

4.4 Week Four (6/11-6/17)

This week, all five days of the week the stock market was open. Similar to the prior week the S and P 500 as well as all other indexes mentioned in chapter one have declined. The S and P 500 was down 5.79%. This ultimately has led to the decline of all stocks observed in the buy and hold portfolio. The rationale for buying stocks that would fare well in a recession was a good thought process behind maintaining a lot of the initial value of the stocks, however, this still shows there is no immunity when the entire market is dropping. Below in Table 4.4 is the trades for this

week. Like prior weeks "selling" a stock shown in the "buy/sell" column of the table uses the closing stock price from the Friday to sell for monitoring purposes. Then the stocks will be "bought" at that same price during Week Five to keep the integrity of the buy and hold strategy.

Table 4.4 Buy and Hold Portfolio Transactions Week 4 (6/11-6/17)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
6/13/2022	CVS	Buy	$93.17	100	$9,317.00	0	$90,123.52	($559.48)
6/13/2022	WBA	Buy	$41.54	240	$9,969.60	0	$80,153.92	($559.48)
6/13/2022	KR	Buy	$51.09	200	$10,218.00	0	$69,935.92	($559.48)
6/13/2022	PEP	Buy	$162.52	60	$9,751.20	0	$60,184.72	($559.48)
6/13/2022	AWK	Buy	$148.27	60	$8,896.20	0	$51,288.52	($559.48)
6/13/2022	WMB	Buy	$34.89	275	$9,594.75	0	$41,693.77	($559.48)
6/13/2022	IMO	Buy	$54.16	180	$9,748.80	0	$31,944.97	($559.48)
6/13/2022	AMZN	Buy	$109.65	80	$8,772.00	0	$23,172.97	($559.48)
6/13/2022	HD	Buy	$289.24	33	$9,544.92	0	$13,628.05	($559.48)
6/13/2022	DAL	Buy	$35.12	245	$8,604.40	0	$5,023.65	($559.48)
6/17/2022	CVS	Sell	$88.66	100	$8,866.00	($451.00)	$13,889.65	($1,010.48)
6/17/2022	WBA	Sell	$39.32	240	$9,436.80	($532.80)	$23,326.45	($1,543.28)
6/17/2022	KR	Sell	$46.20	200	$9,240.00	($978.00)	$32,566.45	($2,521.28)
6/17/2022	PEP	Sell	$157.06	60	$9,423.60	($327.60)	$41,990.05	($2,848.88)
6/17/2022	AWK	Sell	$131.84	60	$7,910.40	($985.80)	$49,900.45	($3,834.68)
6/17/2022	WMB	Sell	$29.74	275	$8,178.50	($1,416.25)	$58,078.95	($5,250.93)
6/17/2022	IMO	Sell	$48.50	180	$8,730.00	($1,018.80)	$66,808.95	($6,269.73)
6/17/2022	AMZN	Sell	$106.22	80	$8,497.60	($274.40)	$75,306.55	($6,544.13)
6/17/2022	HD	Sell	$270.73	33	$8,934.09	($610.83)	$84,240.64	($7,154.96)
6/17/2022	DAL	Sell	$30.26	245	$7,413.70	($1,190.70)	$91,654.34	($8,345.66)

Similar to the week prior, the red values indicate a loss of value in the portfolio from the initial $100,000. The total profit also shows red values as the total profit is negative and the portfolio has lost money throughout this simulation. This reflects all four indexes mentioned and will ultimately continue to indicate the trajectory of success of the buy and hold strategy because there is no altering this portfolio until the six-week simulation is complete. The current value of the portfolio is $91,654.34 which implies an $8,345.66 decrease from the start of the simulation. This is also a $7,786.18 decrease in value from Week Three which is about two times more of a decrease from Week Two to Week Three.

Figure 4.6 below shows the value of the portfolio throughout the week. As it is shown there is a consistent decline in portfolio value for the buy and hold strategy which mimics the indexes.

It should be noted that this strategy is used in the long term and is successful when the market is successful or when a stock recently recovers from fallen stock.
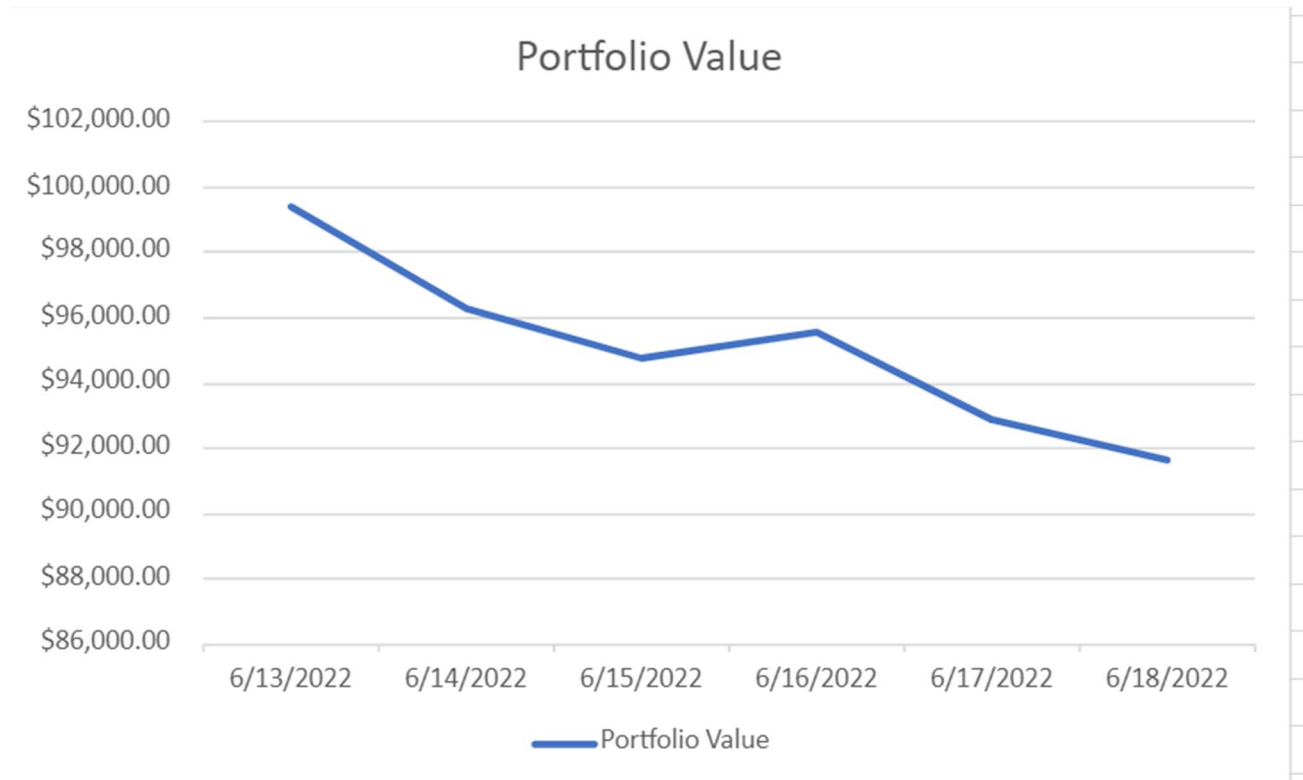
Figure 4.6 Buy and Hold Overall Performance Week 4

4.5 Week Five (6/18-6/24)

For the first time since the start of the simulation, this week the stock market experienced an overall increase. The overall increase of the S and P 500 started on Tuesday with a 2.45% increase and continues with another jump on Friday to be a 6.45% increase as well. The overall increase of this index was 6.45% over the span of the five-day week. Over the course of the week, the majority of the companies observed had shares increase in value. This led to the overall performance throughout the simulation of Amazon, American Water Works, and PepsiCo have a total positive gain in profit thus far.

The buy and hold strategy overall does well when the market is consistently growing and is relatively stable. Throughout this simulation and especially during Week Four, the market was the reason for the buy and hold portfolios' poor performance from that week. Below is Table 4.5 which shows all transactions made in the past week for this portfolio. The "sell" price is the price that each stock was valued at during the closing price on Friday. The next week's stocks will then be bought at the same price. This is done for monitoring purposes.

Table 4.5 Buy and Hold Portfolio Transactions Week 5 (6/18-6/24)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
6/20/2022	CVS	Buy	$88.66	100	$8,866.00	0	$82,788.34	($8,345.66)
6/20/2022	WBA	Buy	$39.32	240	$9,436.80	0	$73,351.54	($8,345.66)
6/20/2022	KR	Buy	$46.20	200	$9,240.00	0	$64,111.54	($8,345.66)
6/20/2022	PEP	Buy	$157.06	60	$9,423.60	0	$54,687.94	($8,345.66)
6/20/2022	AWK	Buy	$131.84	60	$7,910.40	0	$46,777.54	($8,345.66)
6/20/2022	WMB	Buy	$29.74	275	$8,178.50	0	$38,599.04	($8,345.66)
6/20/2022	IMO	Buy	$48.50	180	$8,730.00	0	$29,869.04	($8,345.66)
6/20/2022	AMZN	Buy	$106.22	80	$8,497.60	0	$21,371.44	($8,345.66)
6/20/2022	HD	Buy	$270.73	33	$8,934.09	0	$12,437.35	($8,345.66)
6/20/2022	DAL	Buy	$30.26	245	$7,413.70	0	$5,023.65	($8,345.66)
6/24/2022	CVS	Sell	$94.52	100	$9,452.00	$586.00	$14,475.65	($7,759.66)
6/24/2022	WBA	Sell	$41.65	240	$9,996.00	$559.20	$24,471.65	($7,200.46)
6/24/2022	KR	Sell	$48.45	200	$9,690.00	$450.00	$34,161.65	($6,750.46)
6/24/2022	PEP	Sell	$166.13	60	$9,967.80	$544.20	$44,129.45	($6,206.26)
6/24/2022	AWK	Sell	$148.34	60	$8,900.40	$990.00	$53,029.85	($5,216.26)
6/24/2022	WMB	Sell	$30.05	275	$8,263.75	$85.25	$61,293.60	($5,131.01)
6/24/2022	IMO	Sell	$46.45	180	$8,361.00	($369.00)	$69,654.60	($5,500.01)
6/24/2022	AMZN	Sell	$116.46	80	$9,316.80	$819.20	$78,971.40	($4,680.81)
6/24/2022	HD	Sell	$283.00	33	$9,339.00	$404.91	$88,310.40	($4,275.90)
6/24/2022	DAL	Sell	$31.20	245	$7,644.00	$230.30	$95,954.40	($4,045.60)

As shown above, the only stock to lose value from Week Four to Week Five was the Imperial Oil Company stock. The rest of the stocks gained value back from the week prior regaining $4,300.06 from the initial $8,345.66 deficit from the week prior. The total value of the portfolio ended the week at $95,954.40 with a total loss of $4,045.60 which is more than half of the total loss from Week Five.

Below in Figure 4.7 is the total value of the portfolio throughout the week. It is apparent that the overall stock market increased in value.
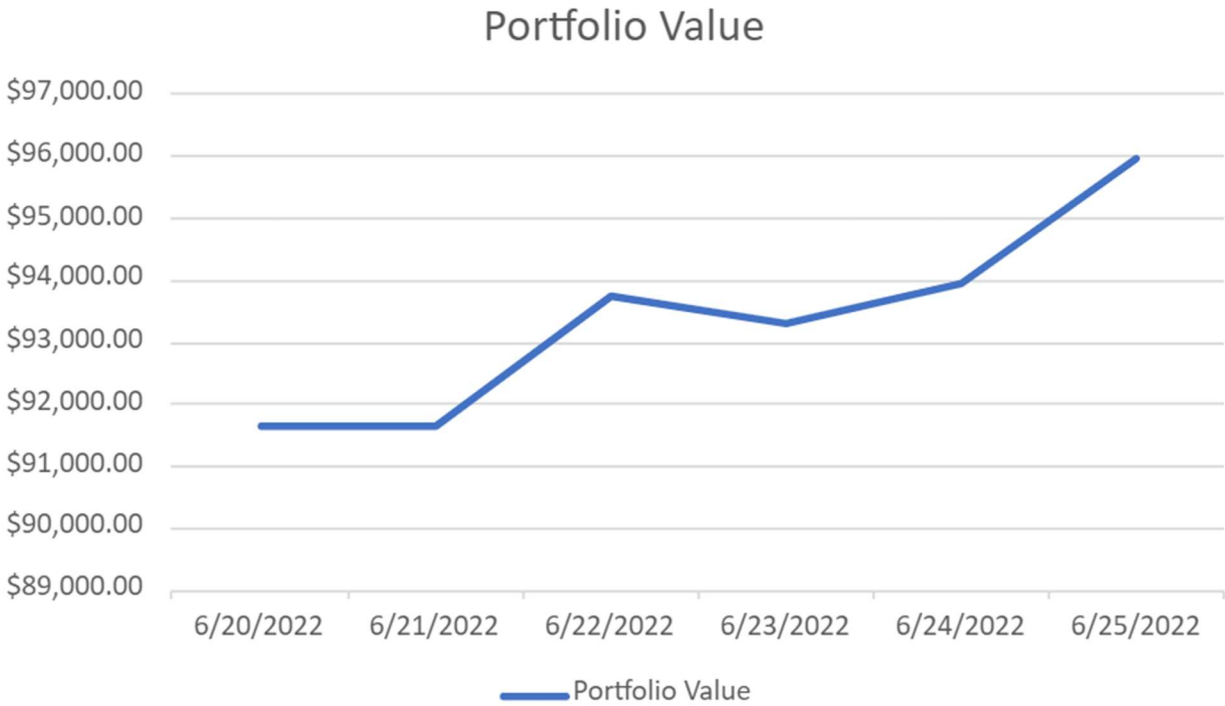
Figure 4.7 Buy and Hold Overall Performance Week 5

4.6 Week Six (6/25-7/1)

During the final week of this simulation, the S and P index declined and overall, most of the observed companies declined as well. The consistent downward trajectory of the market led to an overall decline from the starting value of $100,000 by $5,024.96 leaving the final total value of assets at $94,975.04. Below in Table 4.6 are the final transactions for the buy and hold portfolio. The "Sell" term uses the closing stock value from Friday of that week for monitoring purposes.

Table 4.6 Buy and Hold Portfolio Transactions Week 6 (6/25-7/1)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
6/24/2022	CVS	Buy	$94.52	100	$9,452.00	0	$86,502.40	($4,045.60)
6/24/2022	WBA	Buy	$41.65	240	$9,996.00	0	$76,506.40	($4,045.60)
6/24/2022	KR	Buy	$48.45	200	$9,690.00	0	$66,816.40	($4,045.60)
6/24/2022	PEP	Buy	$166.13	60	$9,967.80	0	$56,848.60	($4,045.60)
6/24/2022	AWK	Buy	$148.34	60	$8,900.40	0	$47,948.20	($4,045.60)
6/24/2022	WMB	Buy	$30.05	275	$8,263.75	0	$39,684.45	($4,045.60)
6/24/2022	IMO	Buy	$46.45	180	$8,361.00	0	$31,323.45	($4,045.60)
6/24/2022	AMZN	Buy	$116.46	80	$9,316.80	0	$22,006.65	($4,045.60)
6/24/2022	HD	Buy	$283.00	33	$9,339.00	0	$12,667.65	($4,045.60)
6/24/2022	DAL	Buy	$31.20	245	$7,644.00	0	$5,023.65	($4,045.60)
7/1/2022	CVS	Sell	$93.94	100	$9,394.00	($58.00)	$14,417.65	($4,103.60)
7/1/2022	WBA	Sell	$38.56	240	$9,254.40	($741.60)	$23,672.05	($4,845.20)
7/1/2022	KR	Sell	$48.14	200	$9,628.00	($62.00)	$33,300.05	($4,907.20)
7/1/2022	PEP	Sell	$169.39	60	$10,163.40	$195.60	$43,463.45	($4,711.60)
7/1/2022	AWK	Sell	$153.43	60	$9,205.80	$305.40	$52,669.25	($4,406.20)
7/1/2022	WMB	Sell	$31.29	275	$8,604.75	$341.00	$61,274.00	($4,065.20)
7/1/2022	IMO	Sell	$47.19	180	$8,494.20	$133.20	$69,768.20	($3,932.00)
7/1/2022	AMZN	Sell	$109.56	80	$8,764.80	($552.00)	$78,533.00	($4,484.00)
7/1/2022	HD	Sell	$279.08	33	$9,209.64	($129.36)	$87,742.64	($4,613.36)
7/1/2022	DAL	Sell	$29.52	245	$7,232.40	($411.60)	$94,975.04	($5,024.96)

It should be noted that PepsiCo, American Water Works, Williams Companies, and Imperial Oil all made a slight profit this week while the rest declined similar to the S and P 500. There was an overall decline between Week Five and Week Six. The asset value of the portfolio dropped $979.00 over the course of the week. Below in Figure 4.8 shows the buy and hold performance for week 6. It is apparent that there was a sharp decline mid-week.
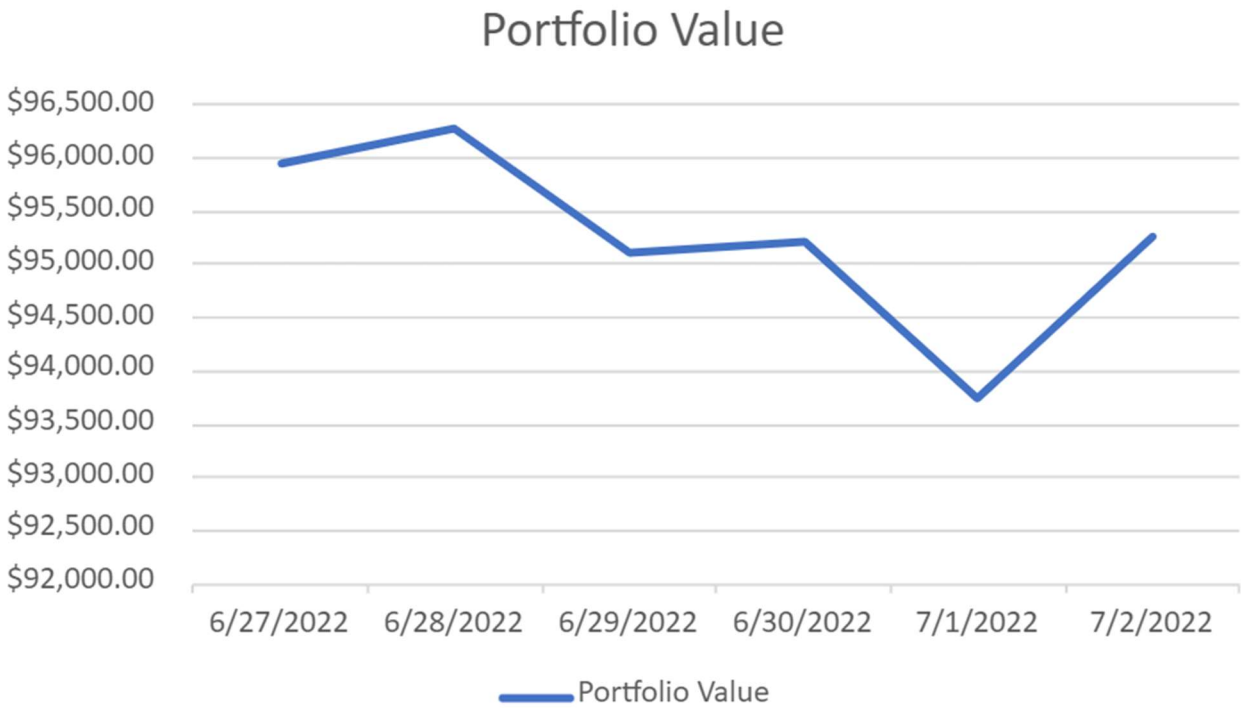
Figure 4.8 Buy and Hold Overall Performance Week 6

Chapter 5: Swing Trading Simulation

The swing trading strategy, like the buy and hold strategy, began with purchasing stocks from all companies mentioned. Each company had the same number of shares invested as the other strategy as well as a similar amount of money invested in each stock. The total initial investment is $95,130.87, which is less than a .2% difference between the amount invested in the buy and hold portfolio. The reason why the portfolios aren't identical is that stock from each company was purchased about ten minutes apart, and with the daily fluctuations of the market, the value did not stay consistent. Like the first portfolio, the swing trading portfolio had about $5,000 sitting in cash in case there was an unforeseen circumstance during the simulation. The swing trading strategy also made trades, besides the initial purchase, once the market is closed for the same reasons as stated in the previous chapter with the buy and hold strategy.

5.1 Week One (5/21-5/27)

On Monday, May 23rd, like the buy and hold portfolio, all initial stocks for the swing trading portfolio were bought. This portfolio was made as identical to the buy and hold portfolio as possible. There were no other trades on the first day because swing trading requires more than a few hours for the development of fluctuations in the stocks before selling. Below is Figure 5.1 from the portfolio tab on the simulation at the end of the first day.

Symbol	Description	Current Price	Today's Change	Purchase Price	QTY	Total Value	Total Gain/Loss	Trade Actions
			TOTAL VALUE $95,767.45	TODAY'S CHANGE $791.10 (0.83%) ↑		TOTAL GAIN/LOSS $791.10 (0.83%) ↑		
AMZN	Amazon.com Inc.	$2,151.14	$223.31 (2.66%) ↑	$2,095.31	4	$8,604.56	$223.31 (2.66%) ↑	⊕ Buy More ⊖ Sell
AWK	American Water Works Co. Inc.	$148.36	$19.80 (0.22%) ↑	$148.03	60	$8,901.60	$19.80 (0.22%) ↑	⊕ Buy More ⊖ Sell
CVS	CVS Health Corp	$95.57	-$12.00 (-0.13%) ↓	$95.69	100	$9,557.00	-$12.00 (-0.13%) ↓	⊕ Buy More ⊖ Sell
DAL	Delta Air Lines, Inc.	$39.52	$46.55 (0.48%) ↑	$39.33	245	$9,682.40	$46.55 (0.48%) ↑	⊕ Buy More ⊖ Sell
HD	Home Depot, Inc.	$286.03	$125.73 (1.35%) ↑	$282.22	• 33	$9,438.99	$125.73 (1.35%) ↑	⊕ Buy More ⊖ Sell
IMO	Imperial Oil Ltd.	$53.23	-$12.83 (-0.13%) ↓	$53.30	180	$9,581.40	-$12.83 (-0.13%) ↓	⊕ Buy More ⊖ Sell
KR	Kroger Co.	$50.22	$216.00 (2.20%) ↑	$49.14	200	$10,044.00	$216.00 (2.20%) ↑	⊕ Buy More ⊖ Sell
PEP	PepsiCo Inc	$165.60	$36.00 (0.36%) ↑	$165.00	60	$9,936.00	$36.00 (0.36%) ↑	⊕ Buy More ⊖ Sell
WBA	Walgreens Boots Alliance Inc	$42.15	$112.80 (1.13%) ↑	$41.68	240	$10,116.00	$112.80 (1.13%) ↑	⊕ Buy More ⊖ Sell
WMB	Williams Cos Inc	$36.02	$35.75 (0.36%) ↑	$35.89	275	$9,905.50	$35.75 (0.36%) ↑	⊕ Buy More ⊖ Sell

Figure 5.1 Starting Portfolio for the Buy and Hold Strategy at the End of Day 1 [23]

The transactions made for the swing trading portfolio were based on the indicators described in previous chapters. Golden and dead crossovers from the moving average and the relative strength index were found to be most helpful in determining when and how much to trade. Below in Figure 5.2 is the Amazon stock and its indicators shown from top to bottom.

Figure 5.2 Amazon Stock on May 26ᵗʰ, 2022 [23]

Located below the stock value are a blue line and an orange line. These are both moving averages. The orange is a longer period moving average and the blue is a shorter period with respect to one another. The blue crossed the orange from the Amazon stock, bottom-up on May 23ʳᵈ, which is a golden crossover. They have since stayed close to one another. This along with the RSI, which is shown in purple below the moving averages reading thirty-four, indicates this is a good time to purchase this stock. Therefore, one stock was purchased in addition to the initial four stocks. Since Amazon stocks are expensive, costing about $2,100, to maintain diversity in a portfolio only one was purchased. This process was used to determine when to buy stocks from the companies selected, and how many to buy.

The process for selling stocks uses the same indicators as buying stocks but is reversed. Below, Figure 5.3 shows the stock from the Williams Companies stock and its indicators.

Figure 5.3 Williams Companies Stock on May 27ᵗʰ, 2022 [23]

The moving average shows a golden crossover that happened on May 24ᵗʰ and signs of a dead crossover happening in the near future. Also, since the RSI reading is close to an overbought condition, it implies that there will soon be a decline in the price of the stock. Therefore, twenty-five stocks from the Williams Companies were sold, which was about 10% of the total initial purchase. This was done because there still is room for growth of the stock, and if this is the case there is the ability to capitalize on it. If it is not the case, it reduces the overall risk.

Below is Table 5.1 where all transactions from Week One is displayed, as well as total cash and total profit from the swing trading portfolio. Below, the column labeled "total assets" is added to this portfolio as an extra value to measure the successes and failures of this portfolio weekly. It measures the value of the portfolio without needing to sell all stocks and then rebuy them at the end of the week. The same information in the total assets column of this is displayed in the "total cash" column in the buy and hold portfolio.

Table 5.1 Swing Trading Portfolio Transactions Week 1 (5/21 – 5/27)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit	Total Assets
5/21/2022							100,000		$100,000.00
5/23/2022	CVS	buy	$95.54	100	$9,553.50	0	$90,446.50	0	
5/23/2022	WBA	buy	$41.84	240	$10,040.40	0	$80,406.10	0	
5/23/2022	KR	buy	$49.45	200	$9,889.80	0	$70,516.30	0	
5/23/2022	PEP	buy	$165.32	60	$9,919.20	0	$60,597.10	0	
5/23/2022	AWK	buy	$147.80	60	$8,868.00	0	$51,729.10	0	
5/23/2022	WMB	buy	$35.96	275	$9,887.63	0	$41,841.47	0	
5/23/2022	IMO	buy	$53.30	180	$9,594.00	0	$32,247.47	0	
5/23/2022	AMZN	buy	$2,095.95	4	$8,383.80	0	$23,863.67	0	
5/23/2022	HD	buy	$281.79	33	$9,298.91	0	$14,564.76	0	
5/23/2022	DAL	buy	$39.56	245	$9,692.20	0	$4,872.56	0	
5/26/2022	AMZN	buy	$2,159.40	1	$2,159.40	0	$2,713.16	0	
5/26/2022	KR	buy	$52.15	10	$521.50	0	$2,191.66	0	
5/26/2022	WMB	Sell	$36.89	25	$922.25	$23.37	$3,113.91	$23.37	
5/27/2022	WBA	Buy	$43.16	20	$863.20	0	$2,250.71	$23.25	
5/27/2022	HD	Buy	$303.54	2	$607.08	0	$1,643.63	$23.25	
5/27/2022	PEP	Sell	$171.26	25	$4,281.50	$148.50	$5,925.13	$171.75	
5/27/2022	KR	Buy	$51.93	10	$519.30	0	$5,405.83	$171.75	
5/27/2022							$5,405.83	$171.75	$105,430.08

There was overall $171.75 in total profit from the stocks sold, however, the value of the portfolio has increased by $5,430.08. Therefore, the overall value of the stocks increased by $5,430.08 this week. Below, Figure 5.4 shows the overall performance of the swing trading portfolio and the overall increase in stock value.
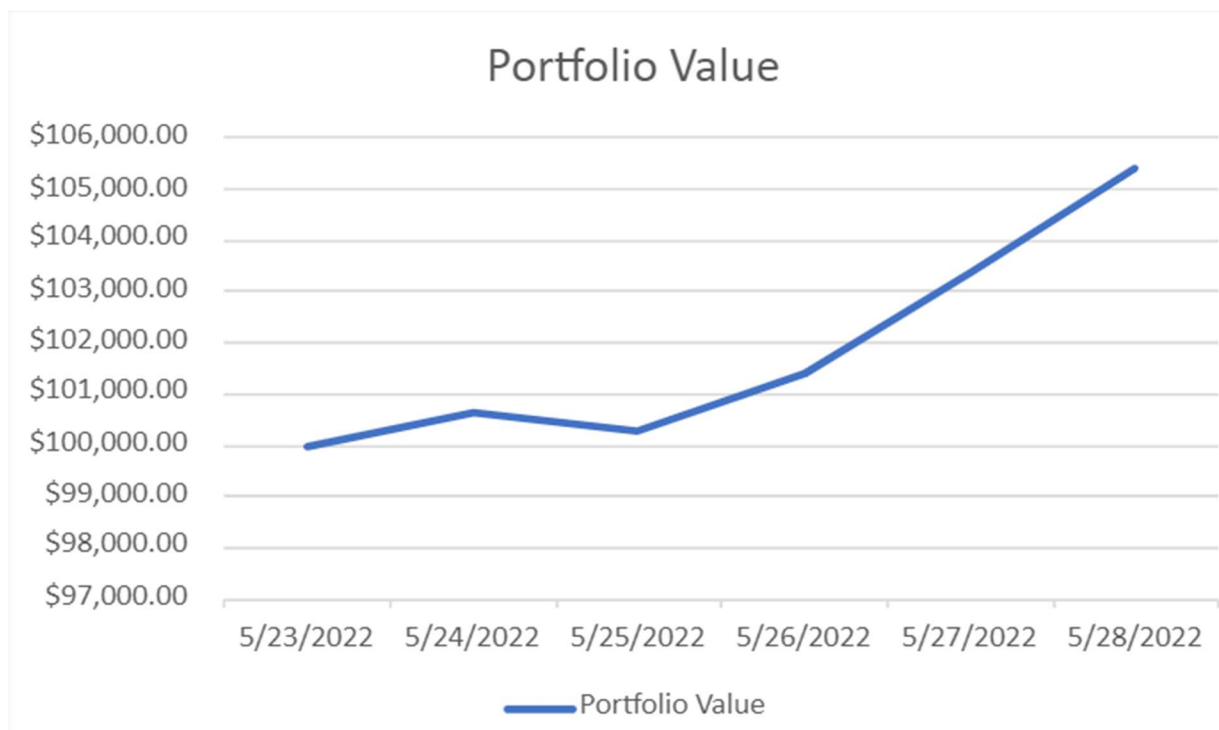
Figure 5.4 Swing Trading Strategy Overall Performance Week 1 2022

5.2 Week Two (5/28-6/3)

Like the buy and hold portfolio, this week, the market was only open for four days instead of five due to Memorial Day on May 30th. The market was overall down this week making it optimal to purchase stocks rather than buy them. There were still, however, opportunities to sell based on indicators that stocks were about to drop such as a high RSI reading or a dead cross over. Below in Table 5.2 are the transactions made for the swing trading portfolio for Week Two. Like the week prior, the column "total assets" was added to provide clarity on the portfolio value when trades are being made. Because no trade was made on Friday before the market closed, an extra row was added to display this information at the end.

Table 5.2 Swing Trading Portfolio Transactions Week 2 (5/28 – 6/3)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit	Total Assets
6/1/2022	CVS	Buy	$97.38	10	$973.80	0	$4,432.03	$171.75	
6/1/2022	HD	Sell	$301.74	15	$4,526.10	$299.32	$8,958.13	$471.07	
6/1/2022	IMO	Sell	$55.35	18	$996.30	$36.90	$9,954.43	$507.97	
6/1/2022	PEP	Buy	$168.18	12	$2,018.16	0	$7,936.27	$507.97	
6/1/2022	WMB	Sell	$37.26	12	$447.12	$15.66	$8,383.39	$523.63	
6/2/2022	CVS	Buy	$96.92	20	$1,938.40	0	$6,444.99	$523.63	
6/3/2022							$6,444.99	$523.63	$104,298.46

All selling transactions were made earlier in the week overall, selling at the market open on Wednesday, June 1st. Buying stock happened that day as well as the day after on June 2nd. Figure 5.5 below shows the CVS stock from the June 2nd transaction. With the sharp decrease in stock value, low RSI, and a golden crossover that occurred a few days prior, this was a sign to buy the CVS stock as there is room for it to increase within the coming weeks.

Figure 5.5 CVS Stock on June 2st, 2022 [23]

The total value of the portfolio dropped to $104,298.46 making the overall increase in value from the beginning of the simulation $4,298.46, which is a $1,131.62 decrease from Week One. However, this portfolio decreased by $129.74 less compared to the buy and hold portfolio. This week the swing trading strategy maintained more value in stocks than the buy and hold strategy

with the decreasing market. Below Figure 5.6 the fluctuations in stock value for the overall portfolio for the week and the portfolio's value.
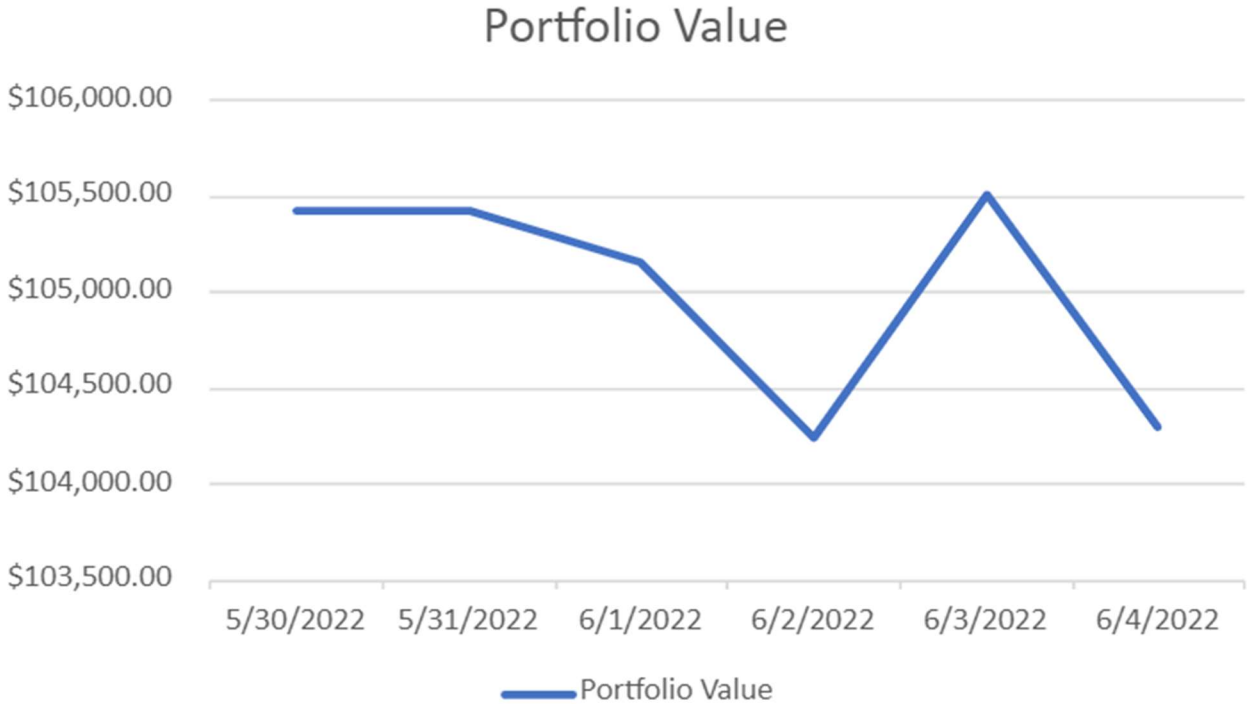
Figure 5.6 Swing Trading Overall Performance Week 2

5.3 Week Three (6/4-6/10)

During Week Three, coinciding with the buy and hold portfolio, the stocks in the swing trading portfolio went down by the end of the week. The overall philosophy this week was to sell in the middle of the week before anything major happened by the end of the week. There were still opportunities to buy throughout the week however, because each stock fluctuated at a slightly different time. The goal was to maintain the diversity in the portfolio while avoiding as much loss in value of a stock as possible. Below in Table 5.3 are the transactions made for the swing trading portfolio for Week Three. Like Week Two, the column "total assets" was added to provide clarity on the portfolio value when trades were made.

Table 5.3 Swing Trading Portfolio Transactions Week 3 (6/4 – 6/10)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit	Total Assets
6/6/2022	AWK	Sell	$156.16	30	$4,684.80	$250.80	$11,129.79	$774.43	
6/6/2022	CVS	Buy	$95.31	10	$953.10	0	$10,176.69	$774.43	
6/6/2022	DAL	Buy	$39.00	27	$1,053.00	0	$9,123.69	$774.43	
6/7/2022	AMZN	Buy	$122.01	2	$244.02	0	$8,879.67	$774.43	
6/8/2022	IMO	Sell	$57.67	20	$1,153.40	$87.40	$10,033.07	$861.83	
6/8/2022	WMB	Sell	$37.75	60	$2,265.00	$107.70	$12,298.07	$969.53	
6/10/2022	CVS	Buy	$91.52	10	$915.20	0	$11,382.87	$969.53	
6/10/2022	HD	Sell	$291.50	8	$2,332.00	$77.72	$13,714.87	$1,047.25	
6/10/2022	IMO	Sell	$55.81	40	$2,232.40	$100.40	$15,947.27	$1,147.65	
6/10/2022	KR	Sell	$50.14	30	$1,504.20	$20.73	$17,451.47	$1,168.38	
6/10/2022	PEP	Buy	$160.97	5	$804.85	0	$16,646.62	$1,168.38	
6/10/2022							$16,646.62	$1,168.38	$99,971.33

The value of the portfolio has decreased by $4,327.13 which is a little less than four times as much loss in total asset value as the week before. Overall, there is a $28.67 loss in portfolio value relative to the beginning of the simulation. This loss is about twenty times less of a loss relative to the buy and holds strategy from Week Three. A lot of stocks showed indications that they needed to be sold close to the end of the week. Figure 5.7 shows imperial oil at an overbought condition on June 7th, then in Figure 5.8 shows the effects from it on June 10th. This overbought condition was apparent starting June 7th and stayed there until it dropped by the end of the day on Friday, June 10th.
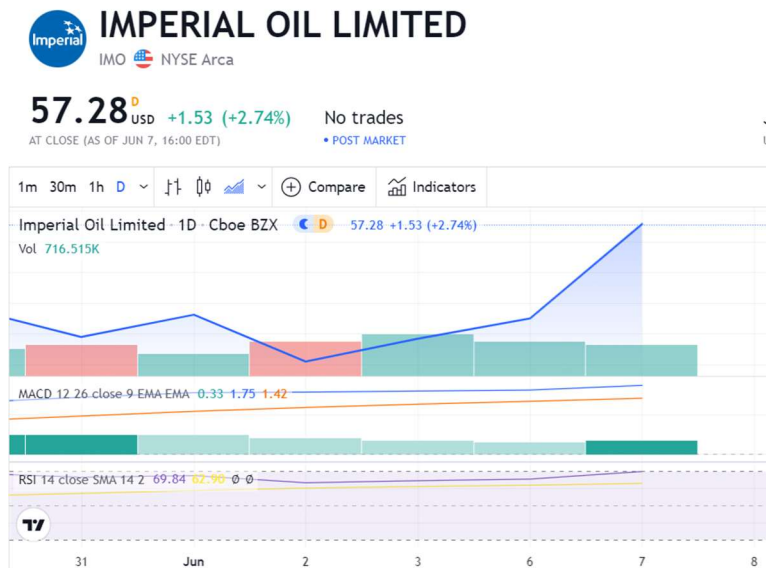
Figure 5.7 Imperial Oil stock on June 7th, 2022 [23]
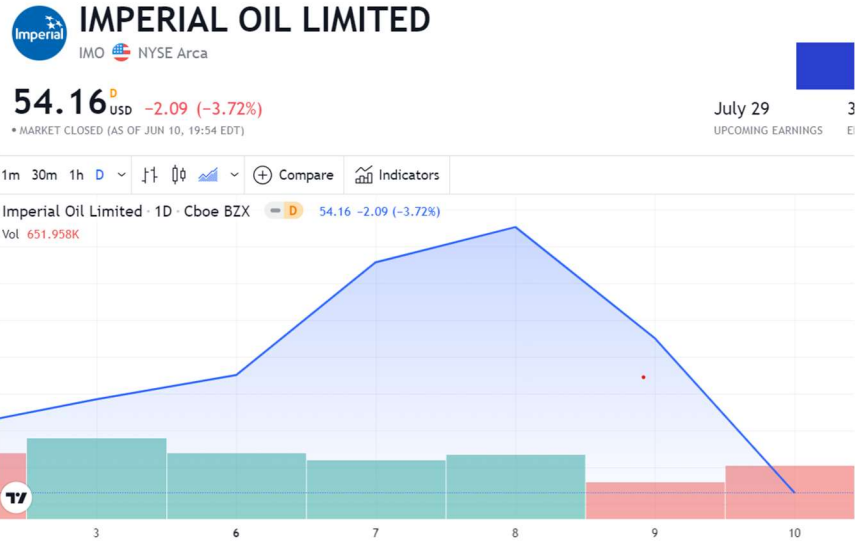
Figure 5.8 Imperial Oil stock on June 10th, 2022 [23]

Like the buy and hold simulation, the swing trading portfolio was affected by the Amazon stock split on Monday, June 6th. Also, like the buy and hold portfolio, adverse effects from the stock split referenced in Figure 4.5 had an impact on this portfolio as well. A purchase of two shares from the Amazon stock was made on June 7th. This was based on the common trend that stock splits tend to increase the value of the stock for a brief bit of time, however, this did not occur. Below, Figure 5.9 shows the fluctuations in stock value for the overall portfolio for the week and the portfolio's value [44].
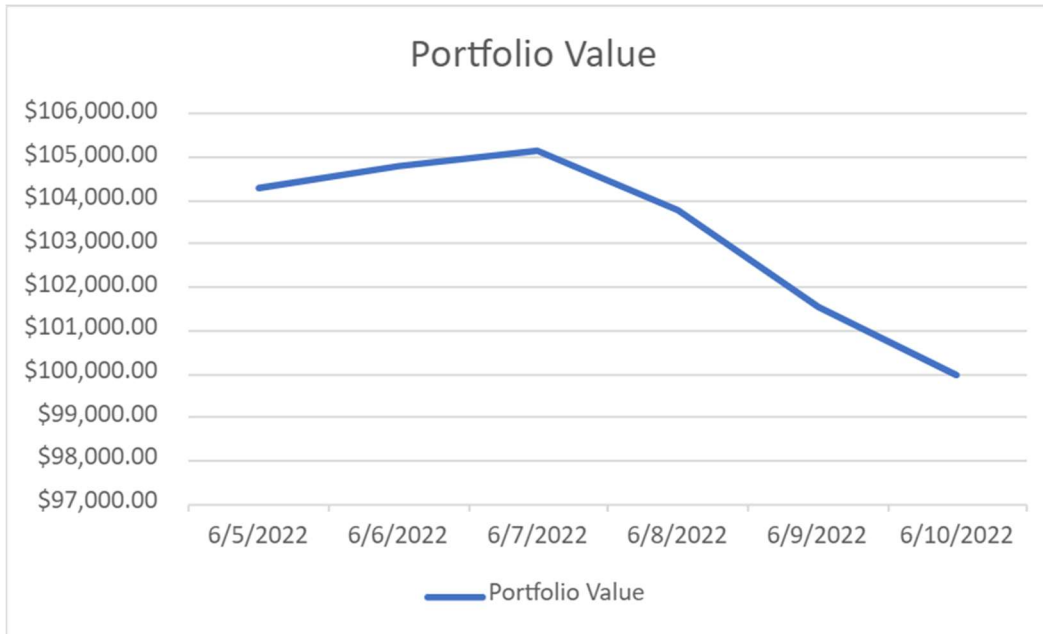
Figure 5.9 Swing Trading Overall Performance Week 3

5.4 Week Four (6/11-6/17)

Similar to the buy and hold strategy, the swing trading strategy suffered during Week Four due to the stock market's overall decline during the month of June. Unlike the buy and hold strategy, more stocks were bought when prices were lower based on the indicators, and stocks were sold the week prior before stocks decreased this week. Below in Table 5.4 were the trades pursued during Week Four. All purchases were buying stocks due to the market continuing to decline and the value of the monitored stocks dropping as well. This is an optimal time to buy because within the past few weeks stocks haven't been consistently dropping. Without selling this week, the profit did not increase nor decrease but the asset value of the portfolio did decrease as shown by the "total asset" column.

Table 5.4 Swing Trading Portfolio Transactions Week 4 (6/11 – 6/17)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit	Total Assets
6/14/2022	AWK	Buy	$140.71	10	$1,407.10	0	$15,239.52	$1,168.38	
6/14/2022	HD	Buy	$283.21	2	$566.42	0	$14,673.10	$1,168.38	
6/14/2022	IMO	Buy	$54.77	20	$1,095.40	0	$13,577.70	$1,168.38	
6/14/2022	WMB	Buy	$33.61	60	$2,016.60	0	$11,561.10	$1,168.38	
6/16/2022	WMB	Buy	$31.08	25	$777.00	0	$10,784.10	$1,168.38	
6/18/2022									$93,185.53

As shown above, no stocks were sold and the total profit did not change. Total assets for the swing trading strategy portfolio are $1,531.19 greater than the buy and hold strategy portfolio. Also, this portfolio has lost $6,785.80 throughout this week which is $1000.38 less loss than the buy and hold strategy from Week Three to Week Four. The overall loss from the beginning of the simulation is $6,814.47 from this portfolio. Below in Figure 5.10 is the value of the portfolio throughout Week Four.

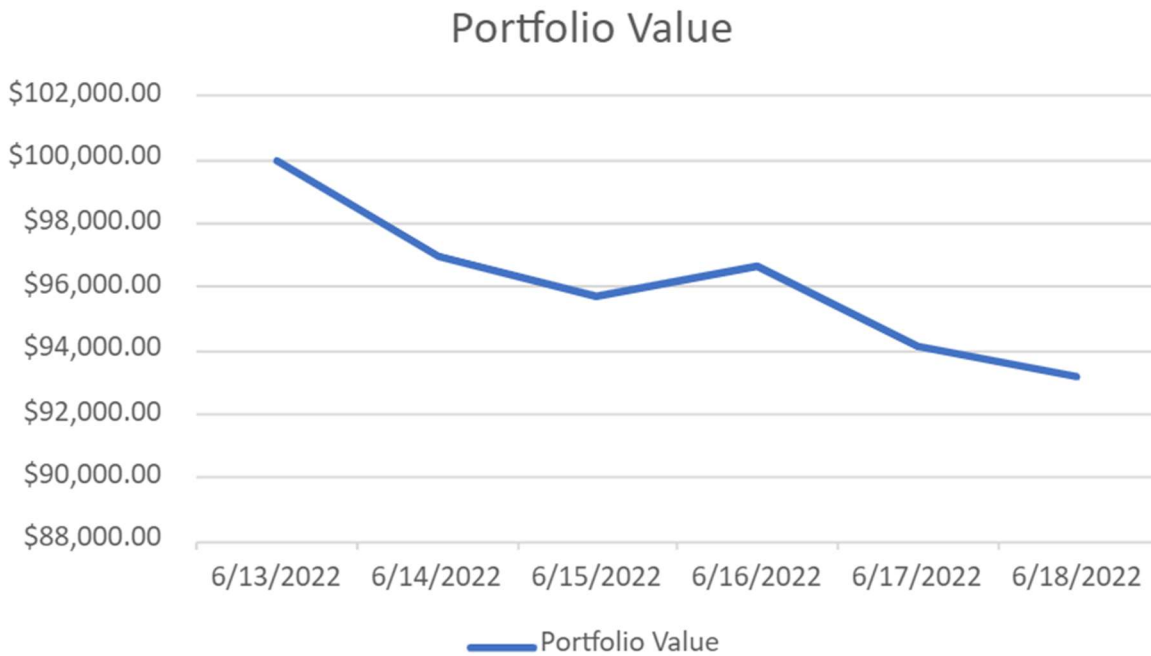

Figure 5.10 Swing Trading Overall Performance Week 4

Most RSI readings throughout the week were below forty-five which is close to an oversold condition and there were many golden crossovers. Therefore, based on the indicators used, buying

this week with no selling was the best option. Since most stocks that were chosen are necessities, and since the portfolio was diverse, the stocks should go up within the remainder of the simulation.

5.5 Week Five (6/18-6/24)

Like the buy and hold strategy, the increase in the S and P 500 and the overall stock market has had a positive effect on the swing trading strategy portfolio. Due to the increase in value in the stock market this week, holding the stocks that were bought weeks prior made the most sense. The RSI was not high enough to indicate an overbought condition and there were no dead crossovers this week, hence there was only one trade made throughout the entire week. The only company that transactions were made this week was PepsiCo. Fifteen shares were sold on the 22nd and this was because it appeared that a dead crossover was going to occur the next day but instead the two moving average lines ultimately grew further apart. There was more liberty taken this week with riskier decisions by holding everything to make as much profit as possible.

Below, Table 5.5 shows the transaction that was made for week five. Total assets was listed on the line below for calculation and monitoring purposes.

Table 5.4 Swing Trading Portfolio Transactions Week 4 (6/18 – 6/24)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit	Total Assets
6/22/2022	PEP	Sell	$160.33	15	$2,404.95	($74.85)	$13,189.05	$1,093.53	
6/25/2022									$97,497.08

Shown above this trade led to a net loss. This was due to seeing an increase in value and selling too soon relative to what the indicators were implying. Total assets for this portfolio increased by $4,312.55 from Week Four to Week Five and decreased the deficit in money lost by over half which is about the same as the increase in value the buy and hold strategy experienced

this week. The total asset value lost from the start of the simulation to week Five is $2,502.92 which decreased the deficit by half.

Below, in Figure 5.11 is the overall asset value of the swing trading portfolio throughout the week.
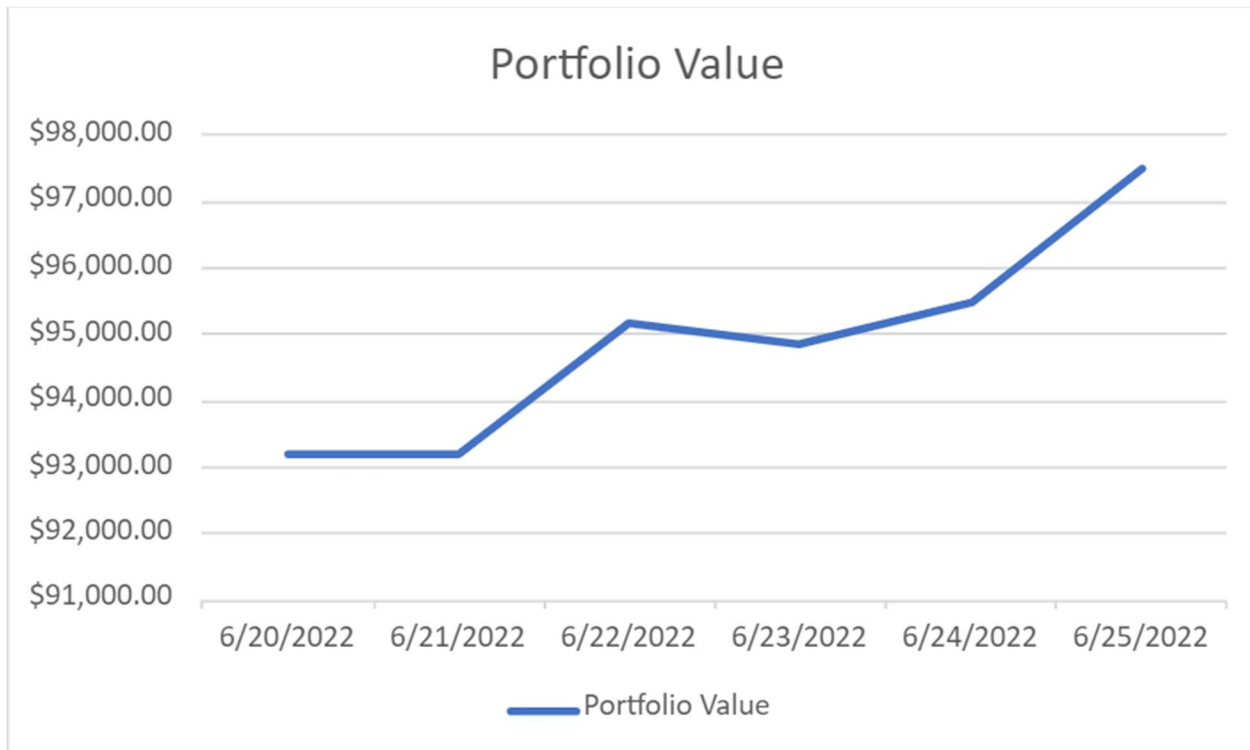
Figure 5.11 Swing Trading Overall Performance Week 5

As shown above, the increase in stock market value overall had a positive impact on the swing trading portfolio.

5.6 Week Six (6/25-7/1)

Like the buy and hold portfolio, there was an overall decline this week in stocks which reflected the S and P 500 decline. Therefore, to attempt to avoid this major drop, stocks were bought mainly at the beginning of the week. Below Table 5.6 show the transactions made during Week Six prior to the final sale at the end of the week.

Table 5.6 Swing Trading Portfolio Transactions Week 6 (6/25 – 7/1)

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit	Total Assets
6/28/2022	HD	Sell	$283.78	12	$3,405.36	$23.94	$16,594.41	$1,117.47	
6/28/2022	KR	Sell	$49.04	60	$2,942.40	($24.54)	$19,536.81	$1,092.93	
6/28/2022	WMB	Buy	$31.24	25	$781.00	0	$18,755.81	$1,092.93	$96,066.66

It is shown that the value of assets dropped by $1,430.42 between Week Five and Week Six. The final asset value at the closing price on Friday for the swing trading portfolio was $96,066.66 with a $3,933.34 decrease in value from the initial investment. This is $1,091.62 greater in value than the buy and hold portfolio at the end of the simulation. Table 5.7 shows the final transaction for each stock that sells all shares in the swing trading strategy portfolio. The selling price was based on the Friday closing price for Week Six.

Table 5.7 Swing Trading Strategy Final Transactions

Date of Transaction	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit	Total Assets
7/1/2022	CVS	Sell	$93.94	150	$14,091.00	($243.00)	$32,846.81	($243.00)	
7/1/2022	WBA	Sell	$38.56	260	$10,025.60	($878.00)	$42,872.41	($1,121.00)	
7/1/2022	KR	Sell	$48.14	130	$6,258.20	($225.80)	$49,130.61	($1,346.80)	
7/1/2022	PEP	Sell	$169.39	37	$6,267.43	$211.67	$55,398.04	($1,135.13)	
7/1/2022	AWK	Sell	$153.43	40	$6,137.20	$546.90	$61,535.24	($588.23)	
7/1/2022	WMB	Sell	$31.29	288	$9,011.52	($816.34)	$70,546.76	($1,404.57)	
7/1/2022	IMO	Sell	$47.19	122	$5,757.18	($550.12)	$76,303.94	($1,954.69)	
7/1/2022	AMZN	Sell	$109.56	102	$11,175.12	$387.91	$87,479.06	($1,566.78)	
7/1/2022	HD	Sell	$279.08	2	$558.16	$349.21	$88,037.22	($1,217.57)	
7/1/2022	DAL	Sell	$29.52	272	$8,029.44	($2,715.77)	$96,066.66	($3,933.34)	$96,066.66

It should be noted that the total assets for the final transaction in Table 5.7 match the total assets in Table 5.6. Also, it is apparent that most companies end with a relatively neutral number in the "Profit/Loss" column. Every company besides Delta Air Lines is less than $900 dollars below or above its starting value. Delta is the only company to have a major decrease in value losing $2,715.77 throughout the span of the six-week simulation. Below in Figure 5.12 shows the asset value daily of the swing trading strategy portfolio.
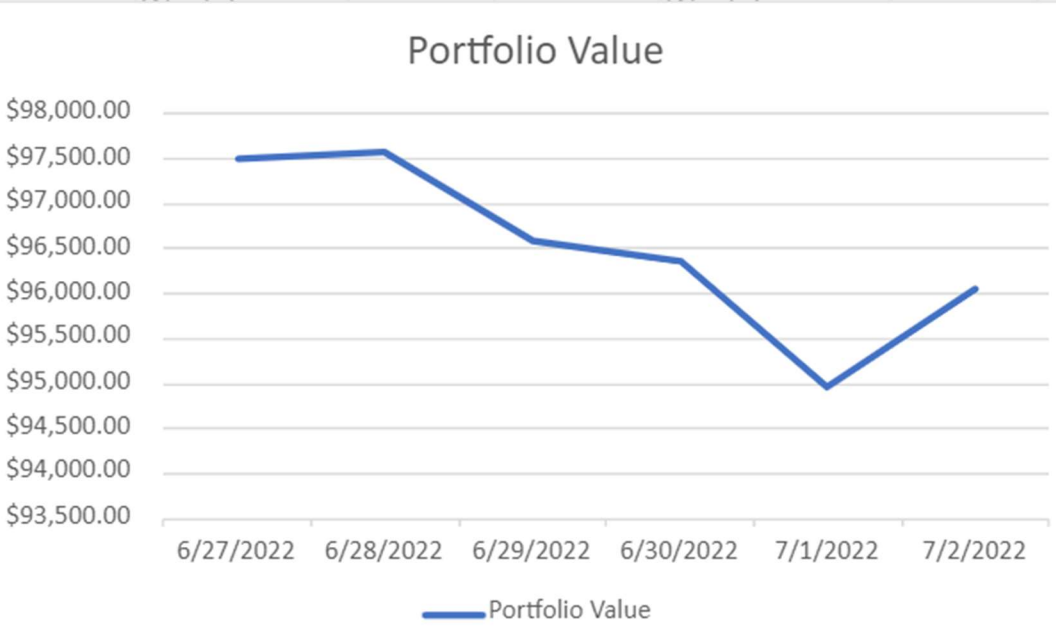
Figure 5.12 Swing Trading Overall Performance Week 6

Similar to the buy and hold portfolio, there was a major decline in asset value in the middle of the week. Given more time, technical analysis indicates that the stock value would recover and gain value in the coming days and weeks.

Chapter 6: Results and Comparative Analysis

This simulation tested two trading strategies in a six-week simulation, the buy and hold strategy, and a swing trading strategy. Both reflected the general stock market performance due to the decline in the market. This decline is apparent when looking at the S and P 500 index over the past six months. The S and P index will be used as a comparison for both strategies as it reflects how the market for the chosen companies and how they reacted throughout the simulation. The value of the S and P 500 on the first day of the simulation, May 23rd, 2022, was $3,973.75, and the ending value of the S and P 500 on July 1st, 2022, was $3,825.33. This is a $148.42 or 3.74% decrease in the S and P 500 index over the six-week simulation. Below in Figure 6.1 is the daily value of the S and P 500 over the past 6 months. Though this does not show the exact period it gives a sense of what the market was doing over the course of the entire simulation.

Figure 6.1 S and P 500 Index over the Six-Month Period Surrounding the Simulation [5]

There has been a gradual decline in the value of the companies in this index throughout the past six months and especially since May. There was an increase during Week One and Week Five of the simulation which was stated in Chapters Four and Five which is also reflected in the S and P 500.

Figure 6.2 shows the change of value throughout the six-week simulation for the buy and hold strategy.
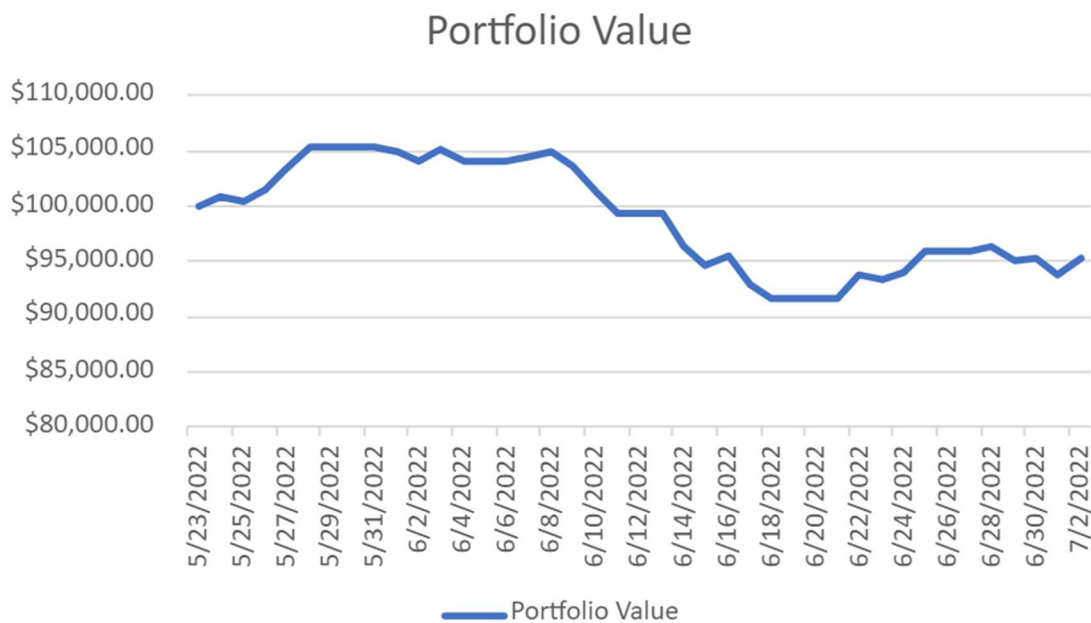
Figure 6.2 Buy and Hold Portfolio Value throughout the Simulation

The buy and hold strategy lost a total of $4,727.80 or 4.7% of its total portfolio. This strategy is considered a failure however it did not perform much worse than the S and P 500 index. Below in Figure 6.3 shows the profit and losses of each company over the course of the entire simulation. It should be noted that most companies that were picked that should maintain value in a recession either made a profit or were close to breaking even.

Figure 6.3 Buy and Hold Portfolio Profit and Loss

Delta Air Lines was the only company that had a significant loss. This company was chosen based on the premise of the high COVID 19 vaccination rate and the period of this simulation, which was in the summer. The travel market, however, continued to get increasingly worse as the simulation kept going. Without this company, this simulation would have been either close to a successful simulation or a true success.

For comparison below Figure 6.4 shows the performance of the swing trading strategy value throughout the course of the simulation.
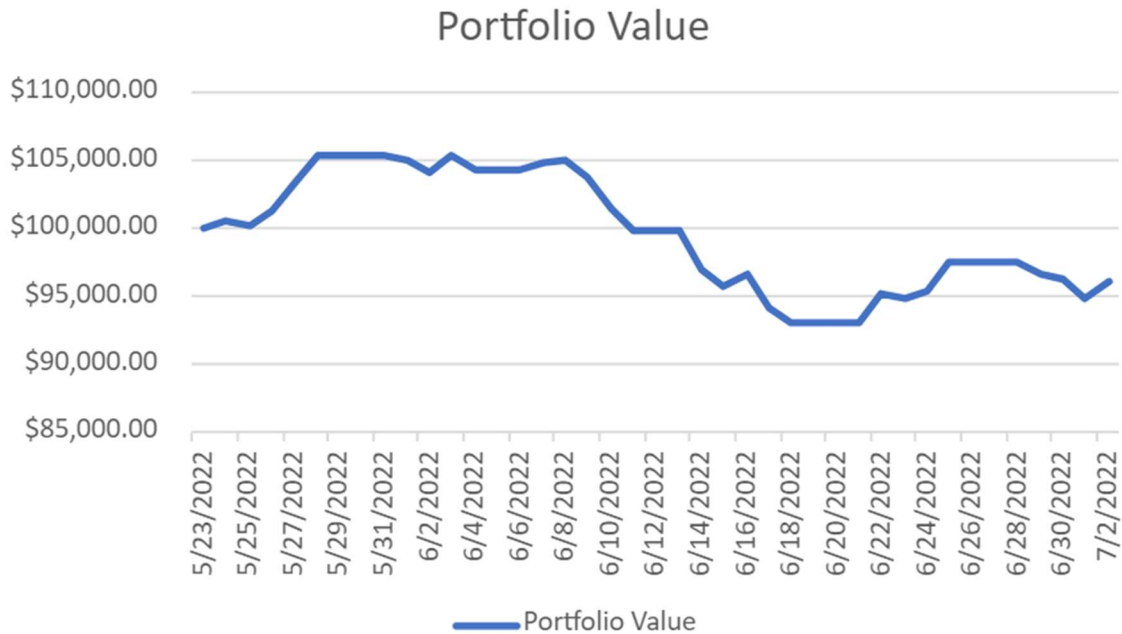
Figure 6.4 Swing Trading Portfolio Value throughout the Simulation

The total loss for the swing trading strategy is $3,933.34 or a 3.9% decrease. This portfolio performed very similarly to the S and P 500 index which performed less than .2% better relative to the swing trading portfolio.

The choice of companies at the beginning of the simulation was the key as to why the loss mirrored the market very closely. Like the buy and hold portfolio, Delta Air Lines was the major cause as to why this portfolio suffered in making a profit. Figure 6.5 below makes it apparent that this was the only company that lost a substantial amount of value.

Profit/Loss

A bar chart titled "Profit/Loss" showing profit and loss values for various stock tickers. The y-axis ranges from ($3,000.00) to $1,000.00 in increments of $500.00. The x-axis shows the tickers: CVS, WBA, KR, PEP, AWK, WMB, IMO, AMZN, HD, DAL. CVS shows a small loss, WBA shows a loss of around ($850), KR shows a small loss, PEP shows a small gain, AWK shows a gain of around $550, WMB shows a loss of around ($800), IMO shows a loss of around ($550), AMZN shows a gain of around $400, HD shows a gain of around $350, and DAL shows a large loss of around ($2,700). Legend: Profit/Loss.
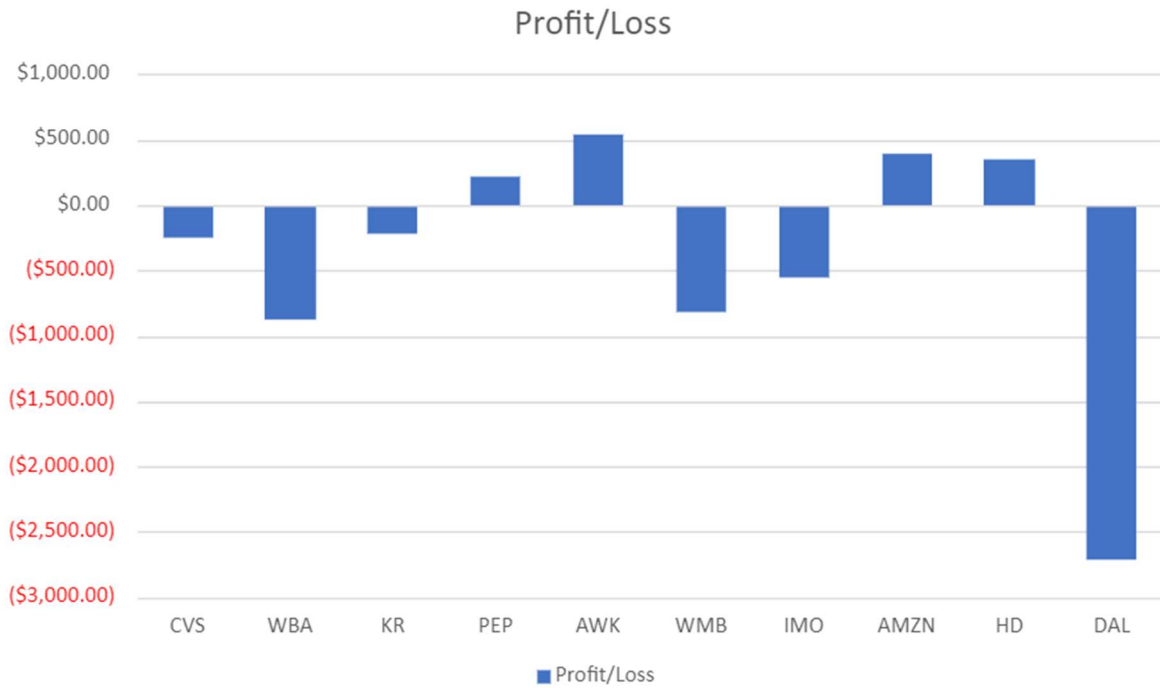
Figure 6.5 Swing Trading Portfolio Profit and Loss

Unlike the buy and hold portfolio which had the Williams Companies and Imperial Oil have a decent value decrease as well, only Delta Airlines lost over $1,000 in value in the swing trading strategy portfolio.

Chapter 7: Conclusion

From the results in the previous chapter, the swing trading strategy using technical analysis is the most effective technique out of the two techniques chosen. However, given more time the results could be drastically different. Given ample time the market has the ability to stabilize, and profit will eventually be made. Overall, because the loss in portfolio values in both cases was minimized in such a volatile and unstable market, the overall simulation and comparison were a success. Loss in both cases was less than 5% of the initial starting value of $100,000 and most of the goals of this project were fulfilled.

The first goal was to gain basic knowledge of the fundamental topics of the stock market as a whole. This was achieved through the background research completed to become familiarized with the behavior of the stock market, what strategies to choose, and what companies to pick. The second goal was to learn how to analyze data in order to become a sufficient investor. This was a success as the loss in value of both strategy portfolios was not significant in the volatile market that occurred throughout the simulation. Though profit was not made this simulation was still successful.

Overall, this project taught the value of investment and how rewarding financial successes can be when getting involved in the stock market. This project has allowed basic techniques and analysis methods to allow success in the American stock market in the future.

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