

Project number: DZT 2305

Stock Market Simulation

An Interactive Qualifying Project Report: Submitted to the Faculty of

WORCESTER POLYTECHNIC INSTITUTE

In partial fulfillment of the requirements for the

Degree of Bachelor of Science

By

Matheos Simantirakis

Submitted:

August 20, 2023

Approved by Professor Dalin Tang, Project Advisor

This report represents the work of one WPI undergraduate student submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on the web without editorial or peer review.

Abstract

The objective of this report is to gain experience on two different investment strategies to determine the best performance and ease of learning. The investment strategies or trading methods being simulated for this report is comprised of the Buy & Hold strategy and Swing Trading strategy. Each investment strategy will be separately utilized in a stock market simulation during a 4-week period. The simulations would have a base \$100,000 to start building the investment portfolio. Each investment strategy would comprise of identical portfolios due to the selected companies for use in both stock market analysis. The final simulation results returned – 6.1% (gain) for the Buy and Hold strategy and – 0.25% (gain) for the Swing Trading strategy, respectively. The final analysis of the simulation concludes based on profits that the Buy and Hold strategy preformed finically better than the Swing Trading strategy.

Acknowledgements

The Interactive Qualitative Project (IQP) completion would not have been possible without several individuals. I would like to thank Professor Tang for the continues guidance and knowledge during the project report. Along with my appreciation toward my parents who modified summer plans and financial support to allow me to participate in this summer IQP. The final appreciation I have is directed toward my school, Worcester Polytechnic Institute (WPI), for logistics.

Table of Contents

Abstract	2
Acknowledgement	3
List of Tables	6
List of Tables	7
Chapter 1: Introduction	9
1.1 Objectives and General Plan	9
1.2 Stock Market History	9
1.3 Influences on the Stocks Market	11
1.4 Market Crashes	13
1.5 Current Stock Market History	14
1.6 Outline of the Project.....	15
Chapter 2: Trading Methods.....	16
2.1 Stock Market Simulation Platform	16
2.2 Buy & Hold Strategy	18
2.3 Swing Trading Strategy	20
Chapter 3: Companies	22
3.1 Company #1 (Best Buy [BBY])	23
3.2 Company #2 (Apple [AAPL])	24
3.3 Company #3 (BP “Oil Industry Company” [BP])	25
3.4 Company #4 (Pfizer [PFE])	27
3.5 Company #5 (ShockWave Medical [SWAV])	28
3.6 Company #6 (Viking Therapeutics [VKTX])	29
3.7 Company #7 (AMAZON.COM [AMZN])	30
3.8 Company #8 (Rio Tinto PLC [RIO])	32

Chapter 4: Buy and Hold Simulation	34
4.1 Buy and Hold Week 1	35
4.2 Buy and Hold Week 2	36
4.3 Buy and Hold Week 3	38
4.4 Buy and Hold Week 4	40
4.5 Summary of Buy and Hold strategy	42
Chapter 5: Swing Trading Simulation	44
5.1 Swing Trading Week 1	44
5.2 Swing Trading Week 2	46
5.3 Swing Trading Week 3	47
5.4 Swing Trading Week 4	49
5.5 Overview of Swing Trading strategy	52
Chapter 6 – Analysis and Comparison	54
6.1 Buy & Hold Summary	54
6.2 Swing Trading Summary	58
6.3 Comparison	62
Chapter 7 – Conclusion	64
References	65

List of Figures

Figure 2.1 Investopedia Simulation Home Page	18
Figure 2.2 Investopedia Simulation Stock Information	19
Figure 2.3 BlackBerry Stock History	20
Figure 2.4 Home Depot Over The Past Year	21
Figure 3.1 Best Buy Over the Past Year	23
Figure 3.2 Apple Over the Past Year	24
Figure 3.3 BP Over the Past Year	26
Figure 3.4 Pfizer Over the Past Year	27
Figure 3.5 ShockWave Medical Over the Past Year	28
Figure 3.6 Viking Therapeutics Over the Past Year	30
Figure 3.7 Amazon.com Over the Past Year	31
Figure 3.8 Rio Tinto Over the Past Year	32
Figure 4.1 Total Asset Gain/Loss Week 1 Graph	36
Figure 4.2 Total Asset Gain/Loss Week 2 Graph	38
Figure 4.3 Total Asset Gain/Loss Week 3 Graph	40
Figure 4.4 Total Asset Gain/Loss Week 4 Graph	42
Figure 4.5 Total Asset Per Week Graph	43
Figure 5.1 Swing Trading Simulation Daily Profit/Loss Week 1	45
Figure 5.2 Swing Trading Simulation Daily Profit/Loss Week 2	47
Figure 5.3 Swing Trading Simulation Daily Profit/Loss Week 3	49
Figure 5.4 Swing Trading Simulation Daily Profit/Loss Week 4	51

Figure 6.1 Amazon.com (AMZN) Stock Profit Gains/Losses per Week	55
Figure 6.2 ShockWave Medical (SWAV) Stock Profit Gains/Losses per Week	56
Figure 6.3 British Petroleum (BP) Stock Profit Gains/Losses per Week	58
Figure 6.4 Rio Triton (RIO) Data and Profits of Selling Transactions	59
Figure 6.5 Viking Therapeutics (VKTX) Data and Profits of Selling Transactions	61

List of Tables

Table 4.1 Buy & Hold Purchased Stocks	34
Table 4.2 Buy & Hold Observations Week 1	35
Table 4.3 Buy & Hold Observations Week 2	37
Table 4.4 Buy & Hold Observations Week 3	39
Table 4.5 Buy & Hold Observations Week 4	41
Table 5.1 Swing Trading Transactions Week 1	44
Table 5.2 Swing Trading Transactions Week 2	46
Table 5.3 Swing Trading Transactions Week 3	48
Table 5.4 Swing Trading Transactions Week 4	50

Chapter 1: Introduction

1.1 Objective and General Plan

The purpose of this IQP is to prepare a beginner investor with the knowledge and skills necessary to become an effective investor with both time and profits. In the first week due to time constraints research into companies would be done to begin the first week's simulation. Alongside gathering information for the method section to ensure the appropriate use of the investment methods for the reports increased accuracy. The two trading methods being compared using the stock market simulation results are the Buy & Hold method and Swing Trading. The trading methods data would be gathered over a period of 4 weeks. Each week simulation would begin on Monday when the market opens and ends when the market closes on Friday. These simulated trades or stock price changes of said week would be recorded on a data table to be analyzed at the end of the report. While the trades are being made with its documentation being recorded, chapters that are not reliant on the simulations would be both researched and filled in simultaneously. At the end of the 4-week simulation all information relevant to the report will be completed over the next few weeks. These include sections, chapters, references, table of contents, & table of figures which require the 4-week simulated results collection. The remaining weeks will be focused on the report's completion along with grammatical edits with the acceptable format for the final draft submission.

1.2 Stock Market History

The beginning of the stock market began in 1300's by Venetian moneylenders. Although this isn't what can be considered a typical stock market it laid the groundwork for its development. The Moneylenders in Venice provide services in areas that larger banks couldn't provided or reach. This consisted of the exchanging of debts between individuals, which includes trading high-risk

& high-interest loans for other loans through a different lender. As individuals use the loan for their growing businesses it was common to sell debt issues to interested investors. The selling of debt issues was a way of raising funds with the seller's obligation to pay the purchaser's back eventually with additional benefits agreed upon. These transactions are similar to an old version of the stock exchange made in face-to-face trades although not in line with what a stock exchange is today [9].

The first attempt at a stock exchange record was in 1531 in Antwerp, Belgium. Compared to the Venetian moneylenders, in Belgium the practice expanded the services offered to public customers. Deals were made between business, governments, and individuals all negotiated with brokers and moneylenders. With the increase of debt issues given promissory notes and bonds were increasingly used to keep track and organized information of the multiple transactions occurring. This exchange broadens the ideas of investing, through financiers which produces profit similarly to stocks of today. Although, this stock exchange was only a national level limiting the exchanges development and potential growth of a globally connected market [9].

The ideas gathered from previous investing practice into a stock exchange, the East Indian Trading company maximizes its possibilities in the 1600's where world trade began to flourish. The East Indian Trading company was a British based trading company with the business advantage of having a government backed monopoly to capture as much wealth created through colonial expansion. The profit of what cargo ships had nearly everyone invested in some way to ride the money pouring into Europe. The technology at the time made maritime travel full of uncertainty with weather and navigation errors. When the East Indian Trading company was approved by Dutch, British, and French charter to expand its profits. The company used an early form of limited liability company for ships. Each ship's voyage was considered a company upon

its self for which to incurred more investment created spreading of risk among multiple investor so if a ship is destroyed each investor won't loss a majority of wealth. If an investor wishes to sell their investment into a ship to recoup cash for another voyage it can be done as well. Since, at the time there were no regulations on the issuing of shares leading to blind investments on goals that haven't been revealed named blind pools creating many crashes holding off trust by investor [9].

In 1773 London, the stock exchange everyone is familiar with begins. The London Stock Exchange applied all past lesson from the Venetian moneylenders, Belgium brokers, & the East Indian Trading companies encouraging investments into a single organized catalog of business to simplify investing. With the issues that occurred with the East Indian Trading company was held back for building trust with investors. Although, across the Atlantic Ocean within the United States different stock exchanges would be created with less restrictions fermenting the possibility for increase wealth or significant loss. The most famous of which is the New York Stock Exchange being unchallenged with its location on wall street and business catalog it remained domestically untouchable for 200 years [9].

1.3 Influences on the Stocks Market

The Stock Market can be best described as a global auction house. As to tell what effects the price of goods, number of participants, and demand for said good varies wildly with no clear answer. A factor that changes the market ones before might occur again with a different reaction from either investors or the market. The influences on the market can be categorized into general factors third general categories [34].

The first category that influences the stock markets is fundamental factors. The fundamental factors are a combination of primarily earning base and valuation multiple. The earning base are accounting measurements for a company's ability to obtain profits over extended periods. A

commonly used measurement is known as cash-based-flow for the reliability of gathering information on a company's financial flexibility long-term. The valuation multiple is an expression of future potential based on the expected growth in profits, interest rates affected by inflation, and the perceived stock risk. These fundamental factors applied to a perfect stock market; stock prices would change due to the fundamental factors alone [34].

The second category is technical factors. The stock market would be easier to predict with only the fundamental factors to consider although the stock market is an imperfect system. The technical factors are a combination of external conditions affecting the supply and demand. The factors include inflation, economic strength of markets, substitutes, incidental transactions, demographics, trends, and news. Each technical factor has the possibility for a positive or negative outcome for one another, best observed with inflation. Inflation determines the purchasing power of investors in the stock market, which in the past low inflation typically increases purchasing power for investments. If inflation is high however, the news would report on the current trend spreading worries among specific demographics to possibly hold off from investing further. The decrease in investments into the markets would lead to the economic strength of markets taking effect view most economic sectors in the negatives dragging down demand in said sectors. This example illustrates how overpowering the technical factors are on the stock market with one change affecting everything including overriding the fundamental factors [34].

The third and final category is market sentiment. Market sentiment is the psychology of the market participant, collectively, and individually. The category is difficult to describe as it's often biased and subjective due to psychological factors holding back the market's natural flow from being artificially high or low. The assumption from this category is that the stock market is not efficient most of the time leading to such strange market reactions [34].

The influences on the stock market can be categorized easily. With the factors building off one another from the understood to the unclear. Each has its part to play in the stock market that we are familiar with today.

1.4 Market Crashes

A stock market crash is defined as the substantial drop in stock prices. Over the history of the stock market there have been many crashes, but it is difficult to draw a clean line when a market is fluctuating or crashing. The commonly accepted threshold, however, is a rapid double-digit percentage decline over several days. There have been only two times where that market crashed so deeply that it affected people globally, these are The Wall Street Crash of 1929 and 2008 Recession also known as the House Market Crash [35].

The Wall Street Crash of 1929 was the drastic collapse of the prosperous 1920's after World War 1. The day when the market crashed from 381 points declining to 299.1 points, a negative 21% drop, became known as black Thursday. This percentage market decline created a selling panic through investors leading to a negative percentage decline of over 10% persisting till 1932. Even when the crash had subsided the damage had been done resulting in The Great Depression. It is believed that over confidence from investors in the market and Federal boards interference in combating market speculation created such conditions for a crash. After all was stabilized the stock market only fully recovered from the effects of the crash in 1954 [35].

The 2008 Recession or called the House Market Crash was a mortgage lending-based crash that saw the market fall of 777.68 points on September 28th which was the greatest decrease in the history of the stock market. The sudden crash was caused by the U.S. Congress refusing to bailout banks which would have stabilized the financial system. With the crash beginning Congress was

forced to pass a bank bailout bill on October 3rd, 2008. With the bill passing it took until March 5th, 2009 before the crash was halted. The result was a 50% drop in the stock market [35].

1.5 Current Stock Market History

The stock market has grown into a complex system from its beginning with moneylenders using ink and paper. The understanding behind the workings of the stock market of today would need a grasp of background information and current events within both the domestic and global communities. The speed of information from news outlets can update your knowledge of the possible changes that can occur. With news articles reporting on events daily can allow strategies to be device for the ability to profit from the ever change market. Looking at the past few years, investors have had quite the struggle keeping up with certain events.

The emergence of COVID-19, in 2020 sent the world struggling to find ways to adapt. The continues update on new variances emerging in different countries, the rapid increase in cases, and similar information being reported by the news still has influence on the markets even after the lockdowns have been lifted. The uncertainty created by the development in news stories of COVID-19 had many investors holding their cash which lead to a slowdown in stock market growth. The sudden slowdown or complete halt of normal function for entire sectors, then reversing to full-time operations still can be felt through the increased delivery times and raising prices to compensate for lost revenue during the pandemic. The larger companies that entered the pandemic, however, have emerged with a drastic economic advantage compared to other sectors causing these larger companies to expand by buying up businesses in the weaker sectors of the economy to profit long-term [36].

The risk of inflation before, during and after the pandemic was always present. The financial consequences of the lockdowns began to be felt immediately. The government reported

a price increase of 7% which compared to the stock market decreased stock value by 8%. The report spooked many investors from purchasing further stocks while the US dollar's value declines. The government would attempt to combat the rising of prices for goods three times in 2022 by lifting interest rates. In a few months the market rebounded but with the lack of effective action the government took towards reducing inflation the markets soon dropped further than when the government first acted [37].

While the world was recovering and dealing with new economic issues, the Russian and Ukrainian war begin in Europe. The uncertainty of supplies being exported from Ukraine and Russia along with the global community responses to the growing situation has people guess on stock market changes. With economic warfare being used rattling global supplies of food, fuel, and fertilizers placing pressure on prices. This led primarily to a price spike for oil on March 7th lasting several months [37].

1.6 Outline of the Project

The outline of the project consists of testing different investment strategies to determine the most efficient and profitable method. Research into different companies would be done to determine the best return on investment. The test would consist of a 4-week stock market simulation for each method. At the end of the 4-weeks a report would be compiled explaining the viable method for maximum profitability along with ease of learning.

Chapter 2: Methods

This Chapter delves deeper into describing the methods and trading strategies this IQP report will use. The methods will include the simulations parameters needed for information gathering along with the final simulation platform decided upon. The trading strategies will give the definition of both strategies. The definitions would include the advantages such as ease of learning along with the risk of such strategies.

2.1 Stock Market Simulation Platform

Stock market simulation platforms are used by investors to practice different methods of investing using digital fake money. This is done so investors can practice their skills and techniques at no risk of losing real money. The chosen simulator must have the ability to accurately reflect the multitude of stocks and their subsequent transactions. Along with the ability to have two simulations running for both investing strategies [18].

The use of Stock Market Simulations has its disadvantages regardless of the platform chosen. Assuming that transitioning from a simulation to real stock market would be seamless is a fallacy. Since simulations can only cover so much, specific factors of trading can be overlooked or ignored by the platform give a false expectation of real stock market trading. In a controlled space bad habits can become second nature, taking great effort to break. Such bad habits include but are not limited to complacency, unrealistic trades, and risky trades. The complacency from over confidence toward a simulated successes streak in profit gains can lead to novice investors having false assumptions to the greater complexities of the real market. The assumptions novice investors additionally make are from the limitation of simulation stocks leading to unrealistic trades. The unrealistic trades that simulation can perpetuate is the lag that can occur between stock transactions to simulated market effect making it seem trades are done quicker than calculated.

Additionally, unrealistic trades can eventually branch into a habit of risky trades being adopted. These disadvantages should be noted when dealing with any market simulation platform as a simulation can and will have differences that could affect real market perceptions for any user.

The simulation platform chosen was Investopedia Simulator from the stock market website Investopedia. Figure 2.1 shows the home page of Investopedia simulation.

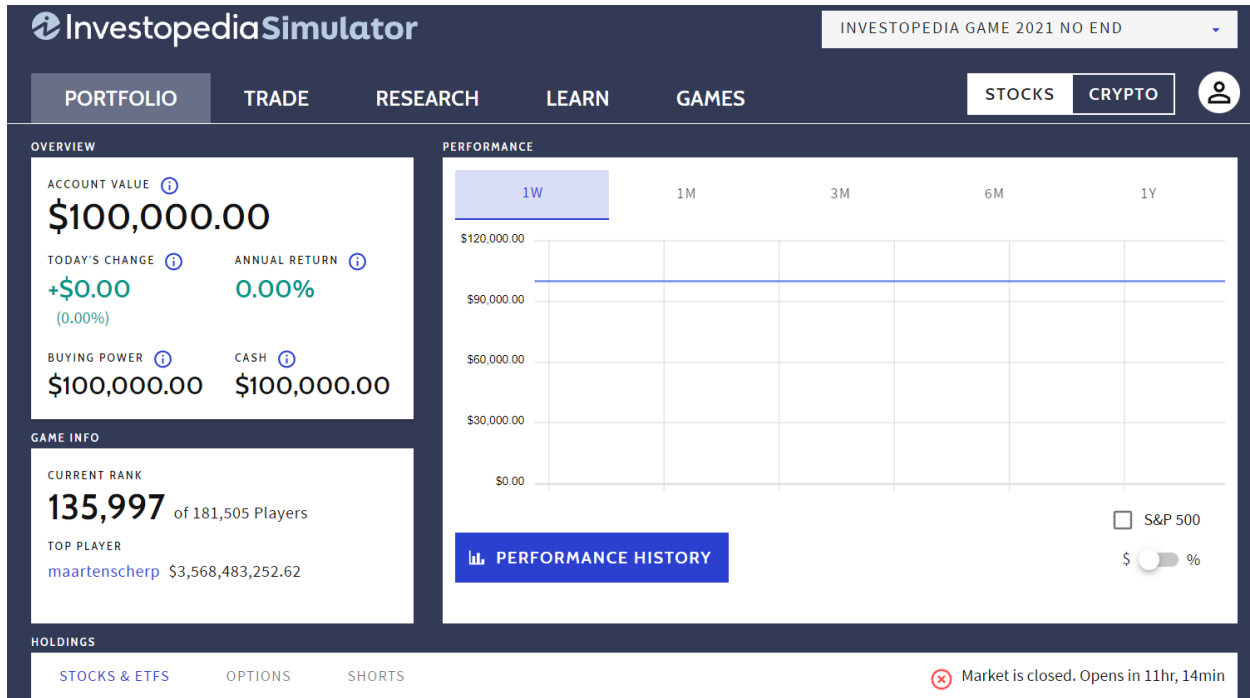


Figure 2.1 Investopedia Simulation Home Page [15]

This simulation has all the basic requirements needed for the IQP reports goals (See Figure 2.1). The simulation makes it convenient to switch between the Swing Trading and Buy & Hold strategy. Able to update any transaction in a timely manner along with both bought and sold stock prices. The purchasing and selling interface have the information needed for each table. Figure 2.2 below shows information of purchased stock such as the daily change of price per share compared to the bought stock price per share. Along with the change in total gains or losses from stock price changes to the quantity of stocks obtained.

TOTAL VALUE		TODAY'S CHANGE		TOTAL GAIN/LOSS	
\$69,018.15		-\$454.40 (-0.65%) ↓		\$3,883.08 (5.96%) ↑	

Symbol	Description	Current Price	Today's Change	Purchase Price	QTY	Total Value	Total Gain/Loss	Trade Actions
AAPL	Apple Inc	\$184.92	-\$54.50 (-0.59%) ↓	\$174.02	50	\$9,246.00	\$545.00 (6.26%) ↑	⊕ Buy More ⊖ Sell
AMZN	Amazon.com Inc.	\$125.49	-\$283.50 (-1.27%) ↓	\$117.73	175	\$21,960.75	\$1,357.88 (6.59%) ↑	⊕ Buy More ⊖ Sell
BBY	Best Buy Co. Inc.	\$79.79	\$81.00 (1.03%) ↑	\$70.88	100	\$7,979.00	\$891.00 (12.57%) ↑	⊕ Buy More ⊖ Sell
BP	BP plc - ADR	\$35.35	-\$6.00 (-0.08%) ↓	\$35.84	200	\$7,070.00	-\$98.00 (-1.37%) ↓	⊕ Buy More ⊖ Sell
PFE	Pfizer Inc.	\$40.06	\$62.00 (0.78%) ↑	\$37.03	200	\$8,012.00	\$606.20 (8.19%) ↑	⊕ Buy More ⊖ Sell
RIO	Rio Tinto plc - ADR	\$67.55	-\$80.00 (-1.17%) ↓	\$61.64	100	\$6,755.00	\$591.00 (9.59%) ↑	⊕ Buy More ⊖ Sell
SWAV	ShockWave Medical Inc	\$294.37	-\$35.40 (-0.60%) ↓	\$284.47	20	\$5,887.40	\$198.00 (3.48%) ↑	⊕ Buy More ⊖ Sell
VKTX	Viking Therapeutics Inc	\$21.08	-\$138.00 (-6.14%) ↓	\$23.16	100	\$2,108.00	-\$208.00 (-8.98%) ↓	⊕ Buy More ⊖ Sell

Figure 2.2 Investopedia Simulation Stock Information [15]

The stock information from Investopedia simulations includes the columns of “Purchase Price” which shows the original prices bought for each stock, “Current Price” shows the value of stocks updated per minute, “QTY” represents the quantity of stock shares bought, “Total Value” represents the combined value of the stocks quantity and current price updated per minute, and “Total Gain/Loss” shows the combined profits either gained or lost updated per minute compared to the origin total value of the stocks (See Figure 2.2). The information shown has a tracker on how much profit is gained or losses occurring with a minutely update. This extra analysis for making the report’s conclusion provides increasing precision with comparison between the investing strategies performance.

2.2 Buy & Hold Strategy

The buy & sell strategy is a passive method which requires investor patience. It’s considered a passive approach to stock trading. The advantage involves the purchasing of a stock to hold for the long term, where short-term changes of the market can be ignored. This is a

preferred strategy for a prolonged stable stock market portfolio along with the tax benefits provided [10].

This strategy, if used correctly can lead to much financial gain but risk is always involved. The stock chosen in this strategy is equally important to the execution. An example of this is the gradual fall of BlackBerry. Figure 2.2 shows Black Berry's stock prices over the years from the companies peak and subsequent fall.

BlackBerry Ltd



Figure 2.3 BlackBerry Stock History [13]

BlackBerry at one point was considered a juggernaut in cellular devices and was believed it could never lose leading to investors to apply this strategy. Currently, other companies have filled in the needs that BlackBerry was unable to keep up with (See Figure 2.3). Due to a lack of management decision mistakes and postponing the adaptation of new technologies lead to the companies to its

current stock price. When using the Buy & Sell strategy ensure that information is gathered on the company's upper management and future goals to limit poor stock choices [16].

2.3 Swing Trading Strategy

The Swing Trading Strategy is a more proactive form of investing which requires an investor to be quick and aggressive. This investment strategy advantage plays off the opportunities through the short-term. The goal is to capitalize on short value increase of stocks to micro profit through constant observation [22].

This strategy can quickly make short-term profits which are often small. The risk that can occur with timing. For example, the stock market price of Home Depot. Figure 2.4 below shows the Home Depot stock prices over the course of the last year.

Home Depot Inc

\$288.57

↓4.70% -14.24 1Y

May 26, 10:07:38 AM UTC-4 · USD · NYSE · Disclaimer

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

[Key events](#)



Figure 2.4 Home Depot Over The Past Year [23]

The Home Depot stock market price in the past year has fluctuated and was hard to predict (See Figure 2.4). How much the stock raises then falls can either make or break this short-term investment strategy. Any small change can create a decision where if the stock falls does the investor risk wait a day to see if the stock goes up to potentially lose more money or sell to cut losses. This constant checking of invested stocks can become time consuming for an individual. Although it's mostly used by experienced investors to keep their skill sharp for short burst of time [33].

Chapter 3: Companies

The importance placed by investors other than investing strategies, described in chapter 2, was the choice in company stocks in which to invest. To summarize chapter 1, section 1.5 describes current events that such choices have a starting point of observation. Recently, US and global markets have been affected by several internal and external factors. In the US, both the especially high inflation and high interest rates have hit the U.S. stock market. The market has had all stock decrease in value and risk in investing has increased. Additionally, the supply chain is having issues from economic sanctions due to the Russia and Ukraine war and patchwork of nations either re-opening or continuing lock down, limiting the bulk of supplies produced leading to raising demand. These events and poor market performances being reported by the news have had a decrease on the US stock market over course of the year.

Recently, the possibility of a recession has become a common subject of U.S. stock market discussions. A recession is defined as a long period of time of declining economic activity and generally begins with two consecutive quarters of negative growth. The news has published many articles on the U.S. stock market disputing if a recession is happening, possible when it exactly begins, and how long it will occur. The many factors creating uncertainty in the markets within the 4-week simulations can be assumed that the possibility of a drastic market improvement is low. With this assumption in mind, it would be best to choose companies to invest in based on the production of necessary goods and vast diversity in products as these company stock would increase in value under current events. Since the uncertainty spread by both economic observations and media coverage, people's worries increased. The change in attitude would lead to products that are unnecessary having a decrease in stock market value. The companies that should be

researched for this report should eventually lead to a diverse investment portfolio branching into different economic sectors [38].

3.1 Company #1: Best Buy

Best Buy is an electronics-based retail chain. The companies stocked products range from household appliances to work-related devices. This flexibility of product choice has made Best Buy stand out from its competitors [11].

In recent months, Best Buy has been riding the pandemic wave which has kept its stock value high due to the increasing of electronics purchases for both online work and school. Figure 3.1 below shows Best Buy (BBY) stock prices over the past year.

Best Buy Co Inc



Figure 3.1 Best Buy Over the Past Year [1]

Although the demand for electronics in the post-pandemic has slowed Best Buy has placed itself in a secure market (See Figure 3.1). With new technology entering the market constantly and management adapting new retail strategies, Best Buy is on firm footing [14].

3.2 Company #2: Apple

Apple is a both a developer and retailer of apple devices. The products sold range from phones to computers. A company that branches into any technology possible to keep the company growing and flexibly within its market [12].

Comparing Apple to Best Buy the post-pandemic greatly benefited the company and so did many of its tech competitors. Figure 3.2 below shows the Apple (AAPL) company stocks prices over the past year.

Apple Inc

\$175.16

↑ 22.40% +32.05 1Y

After Hours: \$175.09 (↓ 0.040%) -0.070

Closed: May 19, 7:59:51 PM UTC-4 · USD · NASDAQ · Disclaimer

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

[Key events](#)

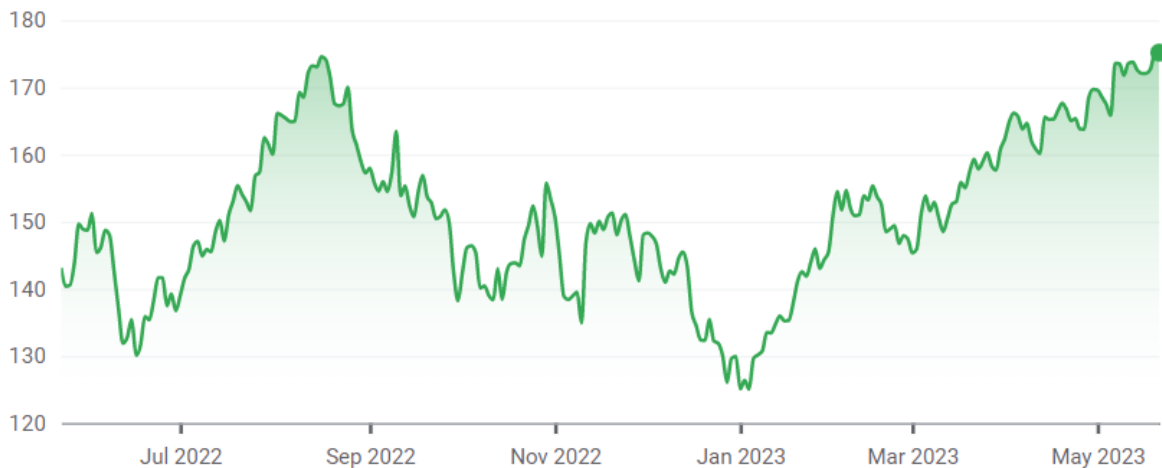


Figure 3.2 Apple Over the Past Year [2]

Having expanded into other technological sectors in which there was an increase in demand helped Apple raise its value (Figure 3.2). This economic boost assisted Apple remaining a leader in its market. If Apple continues with its diversity in emerging technology and excels in adapting the technology into desired products would continue its market dominance [17].

3.3 Company #3: BP

BP also known as British Petroleum has been the largest oil company since 1998. The company specializes in building infrastructure for extraction, refinement, and export of oil to global markets. Additionally, services also include providing maintenance and supervision of their infrastructure [19].

During covid BP suffered greatly from the lack of automotive use. Figure 3.3 below shows British Petroleum (BP) stock prices over the past year.

BP plc

\$36.03

↑ 12.21% +3.92 1Y

After Hours: \$36.00 (↓ 0.083%) -0.030

Closed: May 19, 5:33:11 PM UTC-4 · USD · NYSE · Disclaimer

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



Figure 3.3 BP Over the Past Year [3]

After covid restriction began to be lifted, BP gained a sudden boom of profits that reached an all-time high in 8 years. Many competitors in the oil industry had similar profit increases as well. BP is going strong but should be prepared for when the market inevitably returns to a steady fluctuation of stock prices (See Figure 3.3). In the future, BP's profits and market price will change again with the company's declaration toward moving toward non-oil products for environmental safety which may excite or scare investors due to this change's uncertainty. Although the changes have yet to be fully implemented to tell for certain its profitability [20].

3.4 Company #4: Pfizer

Pfizer is a pharmaceutical and biomedical based company. The company specializes in development, manufacturing, and marketing medication for both humans and animals. This specialization led to Pfizer becoming the largest company within the medical industry [21].

The creation of the vaccine before most competitors gave Pfizer a record revenue of 100 billion. Figure 3.4 below shows Pfizer (PFE) stock prices over the past year.

Pfizer Inc.



Figure 3.4 Pfizer Over the Past Year [4]

With the pandemic reaching its end Pfizer is preparing for the drop in revenue (See Figure 3.4). The prediction given by the company is a 33% drop in revenue between 67 and 71 billion. To greatly increase the worth of the company again, Pfizer would have to create another leap in

the medical field. While competitors regain their footing Pfizer has an opportunity to remain ahead [24].

3.5 Company #5: ShockWave Medical

ShockWave Medical is a medical development and commercialization of new treatment methods in disease within the heart. Specifically, technology in clearing calcium within the coronary arteries for a disease called calcified cardiovascular disease [25].

As the lockdowns began to end ShockWave Medical began to regain interest from the medical community due to the focus on creating a vaccine. Figure 3.5 below shows Shockwave Medical (SWAV) stock prices over the past year.

Shockwave Medical Inc



Figure 3.5 Shockwave Medical Over the Past Year [5]

The Boston Medical Cop. Was interested in this small medical company. The expansion of ShockWave Medical portfolio of its products is still ongoing. Since the deal seems likely to be accepted, the internal growth of the company and the reach across the industry would be of great benefit to its medical goals as well for investors [26].

3.6 Company #6: Viking Therapeutics

Viking Therapeutics is a biomedical company specializing in the development of therapeutics to treat disorders in bodily function. The disorders specifically of the metabolism and endocrine system, a messaging system through hormones into the blood stream [27].

In the past year, Viking Therapeutics had a drug to treat fatty liver disease in for trail testing. Currently, the drug has passed both beginning and mid stage testing to treat patients though hasn't been FDA approved. Even with this promising new drug in its trail phase the company's stocks have increased by 6%. Figure 3.6 below shows Viking Therapeutics (VKTX) stock prices over the past year.

Viking Therapeutics Inc

\$22.97 ↑ 920.89% +20.72 1Y

After Hours: **\$23.15** (↑ 0.78%) +0.18

Closed: May 19, 7:57:19 PM UTC-4 · USD · NASDAQ · Disclaimer

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

[Key events](#)

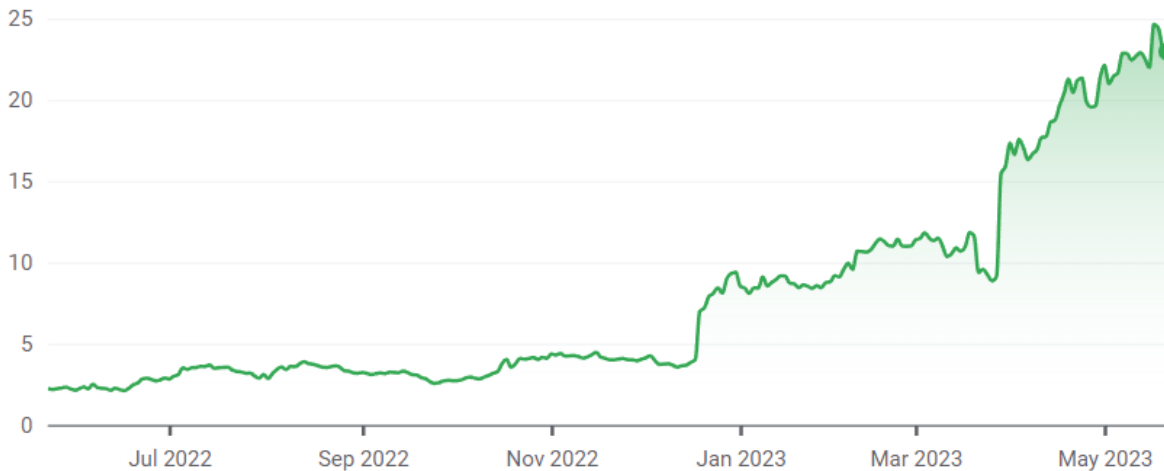


Figure 3.6 Viking Therapeutics Over the Past Year [6]

Multiple competitors are rising to develop similar treatments but as can be gathered Viking Therapeutics is furthest along development (See Figure 3.6). Since fatty liver disease cases have increased over the years the ability to create a treatment is expected to create a multibillion-dollar market. Investors can see the rising potential in Viking Therapeutics, as long as the company keeps its lead in its drug development [28].

3.7 Company #7: Amazon.com

Amazon.com is an online retail and manufacture. This includes electronics books and other web services for customers. The company also sells other non-company made products to broaden products for customers [29].

The flexibility of Amazon.com has led to exiting the pandemic with revenues reaching a high of 137.7 billion. Figure 3.7 below shows Amazon.com (AMZN) stock prices over the past year.

Amazon.com, Inc.



Figure 3.7 Amazon.com Over the Past Year [7]

The company, with its reputation and service earned 700,000 subscribers for Prime video in Britain alone. Although supply chain hold-ups caused difficulty with fulfilling deliveries, strategies were used to keep customers satisfied (See Figure 3.7). Amazon understands that demand would decline in revenue so is trying to pivot toward food delivery. Only a few amazon food stores have been opened, so investors are waiting to see if this would be enough to slow the decline in revenue and return to its steady rise in profits [30].

3.8 Company #8: Rio Tinto PLC

Rio Tinto PLC is a mineral extraction company focusing on the finding, mining, and refinement of minerals. The minerals sot after are bauxite, alumina, copper, gold, nickel, silver, molybdenum, coal, uranium, and iron [31].

Rio Tinto PLC struggled during the pandemic with a product price decrease. With how specialized the company is any effect on product prices is felt multiple times over. Figure 3.8 below shows Rio Tinto (RIO) stock prices over the past year.

Rio Tinto plc ADR Common Stock



Figure 3.8 Rio Tinto Over the Past Year [8]

This led to revenue decreasing by \$29.7 billion in 2022. While the pandemic ends and industry dependent on mineral mines reopens the company is planning on seeing an increase of revenue. How rapid a return to pre-pandemic revenues can only be predicted at the current

moment. All that investors can know for certainty is the need for minerals will always increase for use in infrastructure and developing technologies [32].

Chapter 4: Buy and Hold Simulation

The Buy and Hold Simulation will be done over a 4-week period. Table 4.1 below shows the information of the final decision of stock shares bought. Additional information includes stock prices during the date of transitions, the net cost of shares, and total cash after all stock shares were purchased.

Table 4.1 Buy & Hold Purchased Stocks

Date	of		Price		Net		Total
Transaction	Symbol	Buy/Sell	(USD)	Shares	Cost/Proceeds	Profit/Loss	Cash
05/22/2023	BBY	Buy	70.64	150	10,596.00	***	89,404.00
05/22/2023	AAPL	Buy	174.01	118	20,533.18	***	68,870.82
05/22/2023	BP	Buy	35.87	200	7,174.00	***	61,696.82
05/22/2023	PFE	Buy	36.95	200	7,390.00	***	54,306.82
05/22/2023	SWAV	Buy	283.8	100	28,380.00	***	25,926.82
05/22/2023	VKTX	Buy	23.18	100	2,318.00	***	23,608.82
05/22/2023	AMZN	Buy	115.28	151	17,407.28	***	6,201.54
05/22/2023	RIO	Buy	61.87	100	6,187.00	***	14.54

The first week of the simulation on the first Monday would consist of investing in each of the companies researched along with acquiring a larger quantity of stock shares till total cash was all nearly invested (See Table 4.1). Each week would consist of a report on the rise and fall of each stock calculating the estimated profits if it were to be sold that week. At the end of the 4 weeks all stocks would be sold to see if the companies chosen along with a patients'-based strategy would be were profitable and viable for future application.

4.1 Buy and Hold Week 1

The first week has concluded with a positive profit. Below is Table 4.2 this shows the stocks values in week 1 from the decided stock purchased for the Buy and Hold method. The columns of “assets this week” from Table 4.2 represents the total cash that would be collected if all stocks were sold at the end of the week. Along with the gains or losses of stock prices for both during the week and total assets combined from said week.

Table 4.2 Buy & Hold Observations Week 1

Symbol	Hold/Sell	Buy Price (USD)	Shares	Net Cost	Price Last Week	Price This Week	Asset This Week	Week Gain/Loss	Total Asset Gain/Loss
BBY	Hold	70.64	150	10,596.00	70.64	74.33	11,149.50	553.50	553.50
AAPL	Hold	174.01	118	20,533.18	174.01	175.43	20,700.74	167.56	167.56
BP	Hold	35.87	200	7,174.00	35.87	35.55	7,110.00	-64.00	-64.00
PFE	Hold	36.95	200	7,390.00	36.95	37.6	7,520.00	130.00	130.00
SWAV	Hold	283.8	100	28,380.00	283.8	280.67	28,067.00	-313.00	-313.00
VKTX	Hold	23.18	100	2,318.00	23.18	21.31	2,131.00	-187.00	-187.00
AMZN	Hold	115.28	151	17,407.28	115.28	120.11	18,136.61	729.33	729.33
RIO	Hold	61.87	100	6,187.00	61.87	61.12	6,112.00	-75.00	-75.00
							100,926.85	941.39	941.39

The first week had all stocks been sold would earn \$941.39 in profits. Though a profit had been made four stocks have holding total gains from reaching over \$1,000.00 this week. The stocks in the negative are British Petrolia (BP) with (\$64.00), Rio Tinto (RIO) with (\$75.00), ShockWave Medical (SWAV) with (\$313.00), and Viking Therapeutics (VKTX) with (\$187.00) holding profits back. Figure 4.1 below shows the total Asset Gains and loss over the first weeks along with each stock’s symbol representation under each asset respectively. The “total assets” on

the vertical axis describes the overall changes to profitability possible at the end of this week if all stocks were to be sold.

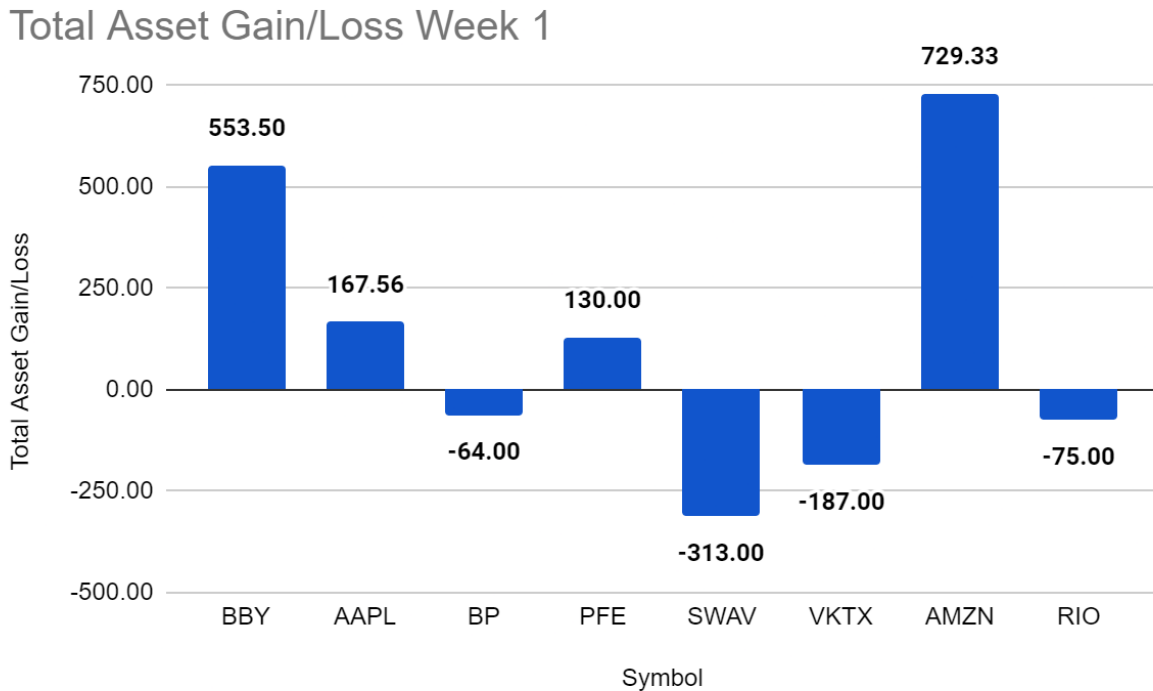


Figure 4.1 Total Asset Gain/Loss Week 1 Graph

For the next week it can only be hoped two possibilities arise. The stocks in the negative become smaller even possibly increasing to have stock gains or currently profitable stocks increase in value to decrease the effect of the losses for other stocks (See Figure 4.1).

4.2 Buy and Hold Week 2

The second week is observed that total profits increased from the first week. Table 4.3 below shows the changes in gains and losses of the second week Buy and Hold simulations. Like last week, the “Asset this Week” is the final total cash collected at the end of the week if all stocks were sold.

Table 4.3 Buy & Hold Observations Week 2

Symbol	Hold/Sell	Buy Price (USD)	Shares	Net Cost	Price Last Week	Price This Week	Asset This Week	Week Gain/Loss	Total Asset Gain/Loss
BBY	Hold	70.64	150	10,596.00	74.33	73.21	10,981.50	-168.00	385.50
AAPL	Hold	174.01	118	20,533.18	175.43	180.95	21,352.10	651.36	818.92
BP	Hold	35.87	200	7,174.00	35.55	35.65	7,130.00	20.00	-44.00
PFE	Hold	36.95	200	7,390.00	37.6	38.36	7,672.00	152.00	282.00
SWAV	Hold	283.8	100	28,380.00	280.67	289.15	28,915.00	848.00	535.00
VKTX	Hold	23.18	100	2,318.00	21.31	22.28	2,228.00	97.00	-90.00
AMZN	Hold	115.28	151	17,407.28	120.11	124.25	18,761.75	625.14	1,354.47
RIO	Hold	61.87	100	6,187.00	61.12	63.17	6,317.00	205.00	130.00
							103,357.35	2,430.50	3,371.89

The a maximum profit of \$3,57.35 for the second week (See Table 4.3). The best earning stock as of the second week is Amazon.com (AMZN) with a \$1,354.47 profit. The stocks of ShockWave Medical (SWAV) and Roi Tinto (RIO) have increased to positive profits from week 1. With ShockWave Medical (SWAV) increase from (\$313.00) to \$535.00 and Roi Tinto (RIO) increasing from (\$75.00) to \$130.00 compared from week 1. Currently, the only stocks with a negative profit are British Petroleum (BP) with (\$44.00) and Viking Therapeutics (VKTX) with (\$90.00) at the end of this week. Figure 4.2 below shows the Total Asset Gains and loss over the second week along with each stock's symbol representation under each asset respectively. The "Total Assets Gain/Loss" on the vertical axis describes the overall changes to profits possible at the end of this week if all stocks were to be sold.

Total Asset Gain/Loss Week 2

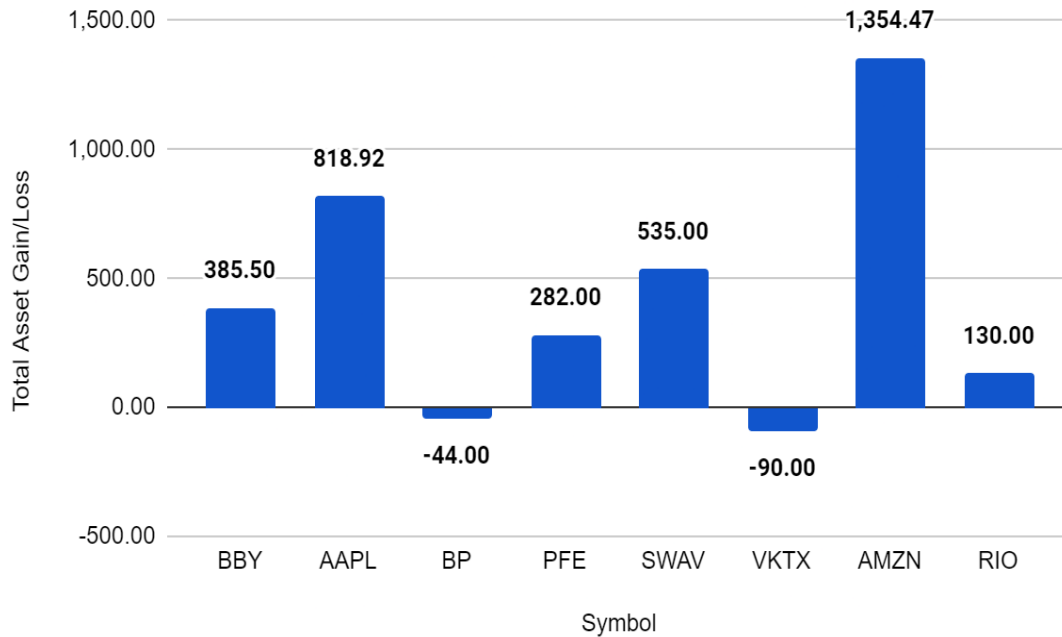


Figure 4.2 Total Asset Gain/Loss Week 2 Graph

Compared to week 1 British Petroleum (BP) increased \$20 and Viking Therapeutics (VKTX) increased \$97 during the second week (See Figure 4.2). If this stock trend continues all stock will eventually gain value. Although the stock of Amazon.com (AMZN) and Apple (AAPL) have enough gain to soften any increase in losses from other stocks.

4.3 Buy and Hold Week 3

The Third week observed an increase in gains from the second week. Table 4.4 below shows the changes in gains and losses of the third week Buy and Hold simulations. Like last week, the “Asset this Week” is the final total cash collected at the end of the week if all stocks were sold. In this week an increase in gains from all stocks except Amazon.com (AMZN). The stock dropped \$123.83 compared to the second week which hasn’t greatly affected Amazon.com (AMZN) profitability.

Table 4.4 Buy & Hold Observations Week 3

Symbol	Hold/Sell	Buy Price (USD)	Shares	Net Cost	Price Last Week	Price This Week	Asset This Week	Week Gain/Loss	Total Asset Gain/Loss
BBY	Hold	70.64	150	10,596.00	73.21	75.24	11,286.00	304.50	690.00
AAPL	Hold	174.01	118	20,533.18	180.95	180.96	21,353.28	1.18	820.10
BP	Hold	35.87	200	7,174.00	35.65	35.47	7,094.00	-36.00	-80.00
PFE	Hold	36.95	200	7,390.00	38.36	38.97	7,794.00	122.00	404.00
SWAV	Hold	283.8	100	28,380.00	289.15	290.48	29,048.00	133.00	668.00
VKTX	Hold	23.18	100	2,318.00	22.28	24.27	2,427.00	199.00	109.00
AMZN	Hold	115.28	151	17,407.28	124.25	123.43	18,637.93	-123.82	1,230.65
RIO	Hold	61.87	100	6,187.00	63.17	64.57	6,457.00	140.00	270.00
							104,097.21	739.86	4,111.75

The third week's total profits were \$4,111.75, an increase of \$739.86 compared to the second week. The best stock continues to remain Amazon.com (AMZN) with \$1,230.65 gains. The stock Viking Therapeutics (VKTX) has gained positive profit from a (\$90.00) to \$109.00 from week 2. Following the increase in gains is Apple (AAPL) with \$820.10 and Best Buy (BBY) with \$690.00 catching up to Amazon.com (AMZN). Figure 4.3 below shows the Total Asset Gains and loss over the third week along with each stock's symbol representation under each asset respectively. The "Total Assets Gain/Loss" on the vertical axis describes the overall changes to profits possible at the end of this week if all stocks were to be sold.

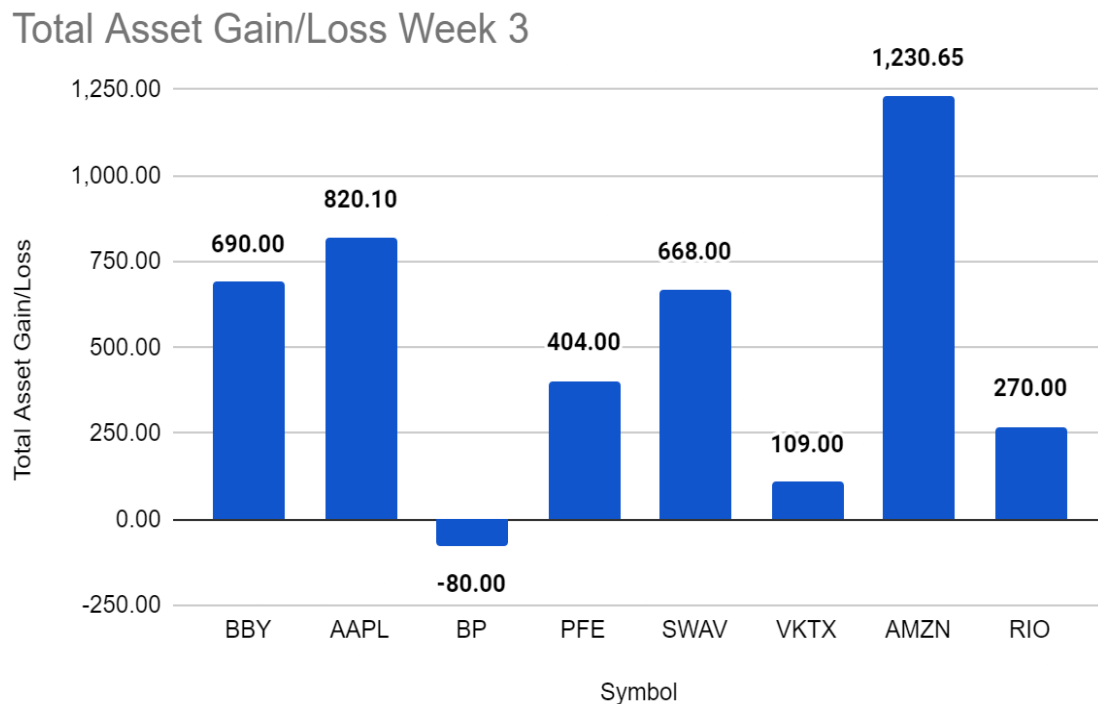


Figure 4.3 Total Asset Gain/Loss Week 3 Graph

Currently, British Petroleum (BP) has had profit decline further negative from (\$44.00) to (\$80.00) which with stock trends seems that this stock will continue to decline (See Figure 4.3). It can be assumed the investments in British Petroleum (BP) stock price decrease can be attributed to the stability of the fuel market.

4.4 Buy and Hold Week 4

The fourth and final week observed an increase in gains from the third week. Table 4.5 below shows the changes in gains and losses of the fourth week Buy and Hold simulations. Like last week, the “Asset this Week” is the final total cash collected at the end of the week if all stocks were sold.

Table 4.5 Buy & Hold Observation Week 4

Symbol	Hold/Sell	Buy Price (USD)	Shares	Net Cost	Price Last Week	Price This Week	Asset This Week	Week Gain/Loss	Total Asset Gain/Loss
BBY	Hold	70.64	150	10,596.00	75.24	79.79	11,968.50	682.50	1,372.50
AAPL	Hold	174.01	118	20,533.18	180.96	184.92	21,820.56	467.28	1,287.38
BP	Hold	35.87	200	7,174.00	35.47	35.35	7,070.00	-24.00	-104.00
PFE	Hold	36.95	200	7,390.00	38.97	40.06	8,012.00	218.00	622.00
SWAV	Hold	283.8	100	28,380.00	290.48	294.37	29,437.00	389.00	1,057.00
VKTX	Hold	23.18	100	2,318.00	24.27	21.08	2,108.00	-319.00	-210.00
AMZN	Hold	115.28	151	17,407.28	123.43	125.49	18,948.99	311.06	1,541.71
RIO	Hold	61.87	100	6,187.00	64.57	67.55	6,755.00	298.00	568.00
							106,120.05	2,022.84	6,134.59

The fourth and final week total profit was \$6,134.59, an increase of \$2,022.84 the compared to week 3. The best stock for this week continues to be Amazon.com (AMZN) at a \$1,541.71 profit. Though the two stocks returned to negative profits there are four stocks with gains over \$1,000 which are Best Buy (BBY) with \$1,375.50, Apple (AAPL) with \$1,287.88, ShockWave Medical (SWAV) with \$1,057.00, and Amazon.com (AMZN) with \$1,541.71. The two stocks with a gain turning into loss is British Petroliam (BP) with (\$104.00) and Viking Therapeutics (VKTX) with (\$210.00) for this final week. Figure 4.4 below shows the Total Asset Gains and loss over the fourth week along with each stock’s symbol representation under each asset respectively. The “Total Assets Gain/Loss” on the vertical axis describes the overall changes to profits possible at the end of this week if all stocks were to be sold.

Total Asset Gain/Loss Week 4

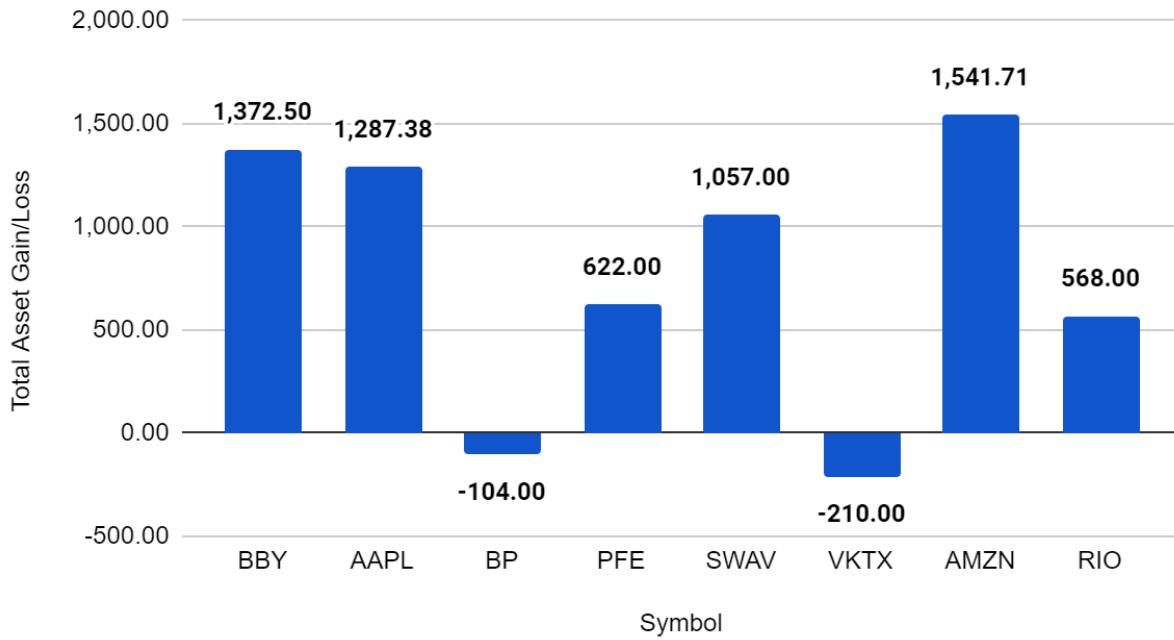


Figure 4.4 Total Asset Gain/Loss Week 4 Graph

4.5 Overview of Buy and Hold past 4 weeks

The Buy and Hold method over the past 4 weeks provided a \$6,134.59 profit. Below Figure 4.5 illustrates the total asset growth over the four-week simulation period.

Total Assets Per Weeks

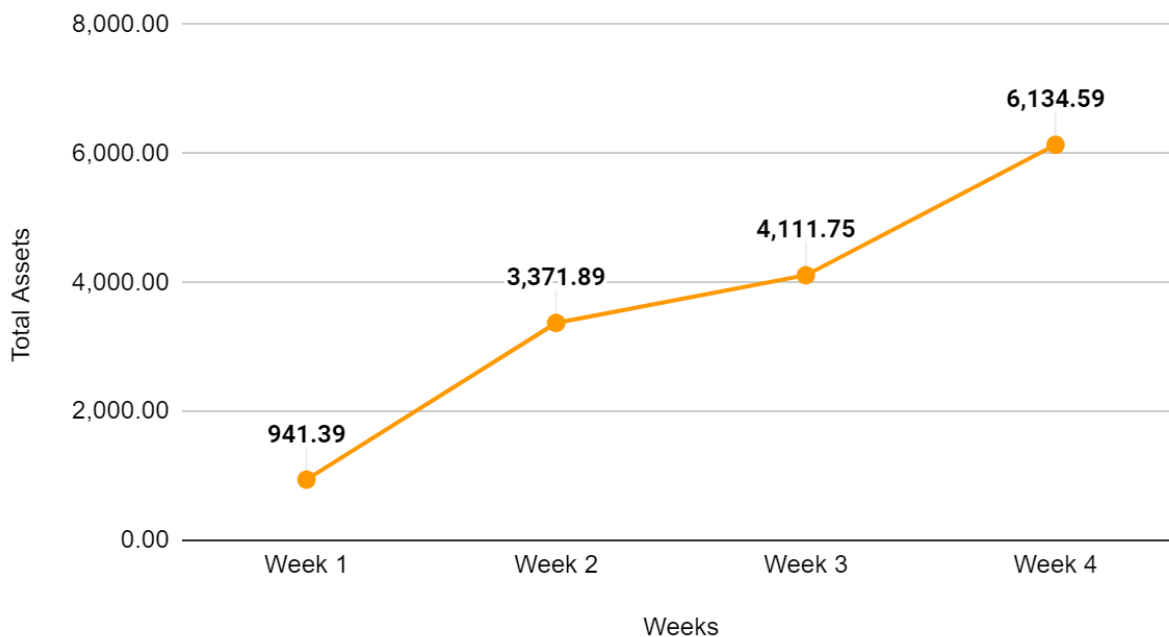


Figure 4.5 Total Asset Per Week Graph

The stocks bought during the simulation averaged consistently leaning toward either increasing or decreasing in profitability. The stocks that provide the most benefit and could be relied upon for increasing profitability were Best Buy (BBY), Apple (AAPL), ShockWave Medical (SWAV), and Amazon.com (AMZN) (See Figure 4.5). While the stocks most of the time provided the losses from the Buy and Hold portfolio are British Petroleum (BP) and Viking Therapeutics (VKTX)

Chapter 5: Swing Trading Simulation

The Swing Trading Simulation will be done over the 4-week period. During this period, everyday investments would be made into stocks. Observing the stocks, a decision would be made to buy or sell a certain number of stocks daily. The week would end when the stock market closes, which is every Friday at noon. At the end of every week the table of relevant information of the trades such as stock market prices sold and which stocks purchases.

5.1 Swing Trading Week 1

Similarly, to the Buy and Hold portfolio all stocks chosen to invest in were observed during the first week of simulation for the Swing Trading portfolio. During the first day of Swing Trading strategy, it was required a few hours of wait between purchase or sells of stocks. Below in Table 5.1 shows the Swing Trading transactions of either profits or losses per day during the first week.

Table 5.1 Swing Trading Transactions Week 1

Date of Transaction	Symbol	Buy/Sell	Price (USD)	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
05/22/2023	BBY	Buy	70.89	100	7,089.00	***	92,911.00	
05/22/2023	APPL	Buy	174.1	100	17,409.80	***	75,501.20	
05/22/2023	APPL	Sell	174.42	100	17,442.00	32.2	92,943.20	32.2
05/22/2023	PFE	Buy	38.44	100	3,844.12	***	89,099.08	
05/23/2023	PFE	Sell	38.75	100	3,875.00	30.88	92,119.96	63.08
05/23/2023	PFE	Buy	38.55	100	3,855.00	***	89,199.08	
05/23/2023	BBY	Sell	71.16	100	7,116.00	27.00	96,233.08	90.08
05/25/2023	RIO	Buy	59.51	100	5,951.00	***	90,282.08	
5/25/2023	SWAV	Buy	276.05	50	13,802.51	***	76,461.58	
05/25/2023	SWAV	Sell	277.02	50	13,851.00	48.49	90,312.58	138.57
05/26/2023	RIO	Sell	61.19	100	6,119.00	150	96,431.58	288.57
5/26/2023	VKTX	Buy	21.07	200	4,184	***	92,247.58	

This first week had an increase in profits, making \$288.57 gains. In Figure 5.1 below, shows the total profit per day from Monday till market closure on Friday during the full first week.

Swing Trading Transactions Week 1

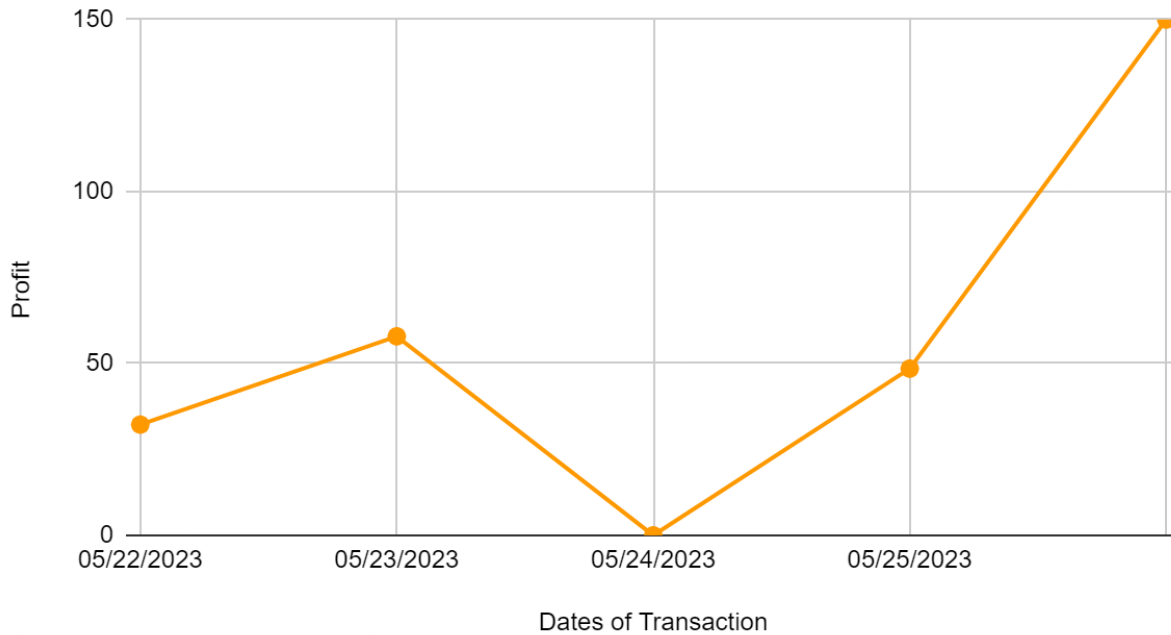


Figure 5.1 Swing Trading Simulation Daily Profit/Loss Week 1

Surprisingly, I assumed that Apple (APPL) would be the stock I would profit the most but only made \$32.2. The two stock that mainly kept profits up were with Rio Tinto (RIO) making \$150.00 and ShockWave Medical (SWAV) making \$48.49 (See Figure 5.1).

Currently, there is only one stock that was purchased that has a chance to increase next week. The stock in the negative was Best Buy (BBY) with a \$70.89 purchasing price. For a change of catching an increase in value observation of the stock we need to be checked every hour next week.

5.2 Swing Trading Week 2

The second week had a difficult profitability compared to the first week. During the middle and end of the second week stock prices began declining. The second week primarily focuses on purchasing stocks for the third week. Below Table 5.2 shows the Swing Trading transactions of either profits or losses per day during the second week.

Table 5.2 Swing Trading Transactions Week 2

Date of Transaction	Symbol	Buy/Sell	Price (USD)	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profits
5/30/2023	VKTX	Sell	21.28	200	4,256.00	72	96,509.58	360.57
5/30/2023	SWAV	Buy	288.02	50	14,401.00	***	82,102.58	
5/30/2023	BP	Buy	34.74	200	6,948.00	***	75,154.58	
06/01/2023	VKTX	Buy	22.18	100	2,218.00	***	72,936.58	

The second week had a low profit yield for its entirety. With only Viking Therapeutics (VKTX) stock making adding \$72.00 to the total profit with \$360.57 combined for this week. Figure 5.2 below shows the total profit per day from Monday till market closure on Friday during the full second week.

Swing Trading Transactions Week 2

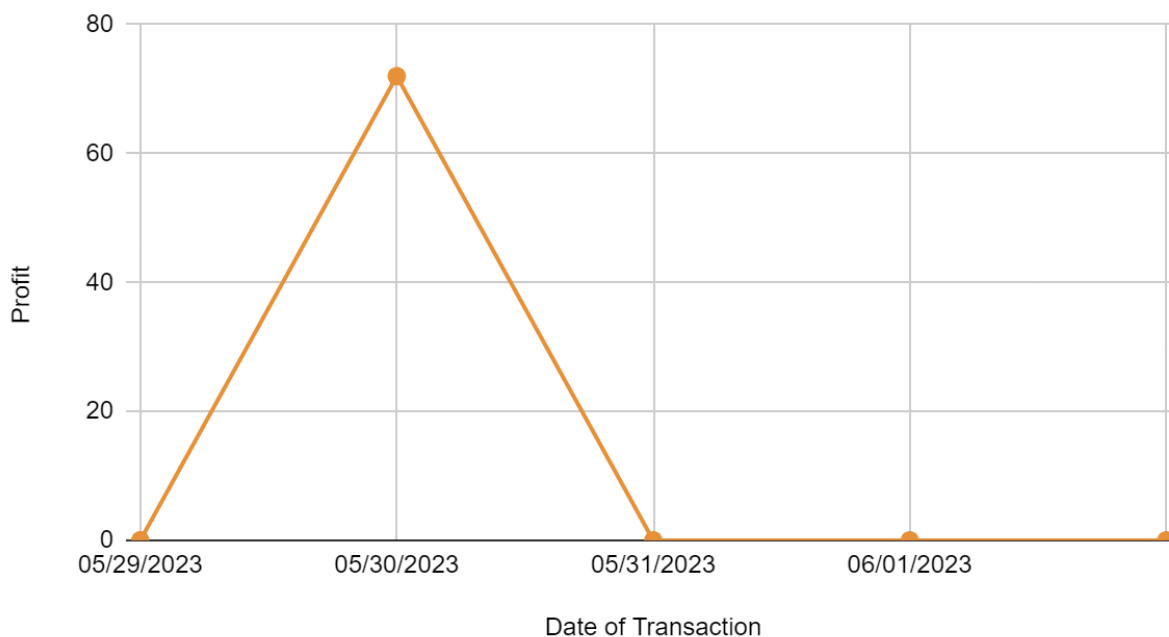


Figure 5.2 Swing Trading Simulation Daily Profit/Loss Week 2

For the ShockWave Medical (SWAV), British Petroleum (BP), and the new stock of Viking Therapeutics in negative profit. At the end of the week came the problem with the swing trading strategy. Observing every hour for most of the day the stocks remained unprofitable, timing the purchasing of stocks poorly (See Figure 5.2). Although, when checking the stock market again in the afternoon, minutes after the markets closed the unprofitable stocks were over \$100 of profit. Now it can only hope that the stocks remain positive into the third week or stocks will need to be sold to cut losses.

5.3 Swing Trading Week 3

The third week had an increase in profit. The hope for this week to increase profits from week 2 went better than expected. Below Table 5.3 shows the Swing Trading transactions of either profits or losses per day during the third week.

Table 5.3 Swing Trading Transactions Week 3

Date of Transaction	Symbol	Buy/Sell	Price (USD)	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profits
06/05/2023	SWAV	Sell	285.17	50	14,258.50	-142.5	87,195.08	218.07
06/05/2023	BP	Sell	35.84	200	7,168.00	220	94,363.08	438.07
06/05/2023	VKTX	Sell	22.92	100	2,291.99	73.99	96,673.08	512.06
06/05/2023	BP	Buy	35.43	200	7,086.00	***	89,587.08	
06/07/2023	PFE	Sell	38.71	100	3,870.50	15.5	93,457.58	527.56
06/07/2023	BP	Sell	35.57	200	7,119.00	33	100,570.58	560.56
06/08/2023	BBY	Buy	74.46	100	7,446.00	***	93,124.58	
06/08/2023	RIO	Buy	64.34	100	6,434.00	***	86,690.58	
06/09/2023	BBY	Sell	75.56	100	7,544.50	98	94,234.58	658.56
06/09/2023	BP	Buy	35.51	200	7,101.00	***		

At the beginning of the week Shockwave Medical (SWAV) to stock price was declining significantly, for which were sold to prevent further profit decrease with a final \$142.50 profit loss. Figure 5.3 below shows the total profit per day from Monday till market closure on Friday during the full third week.

Swing Trading Transactions Week 3

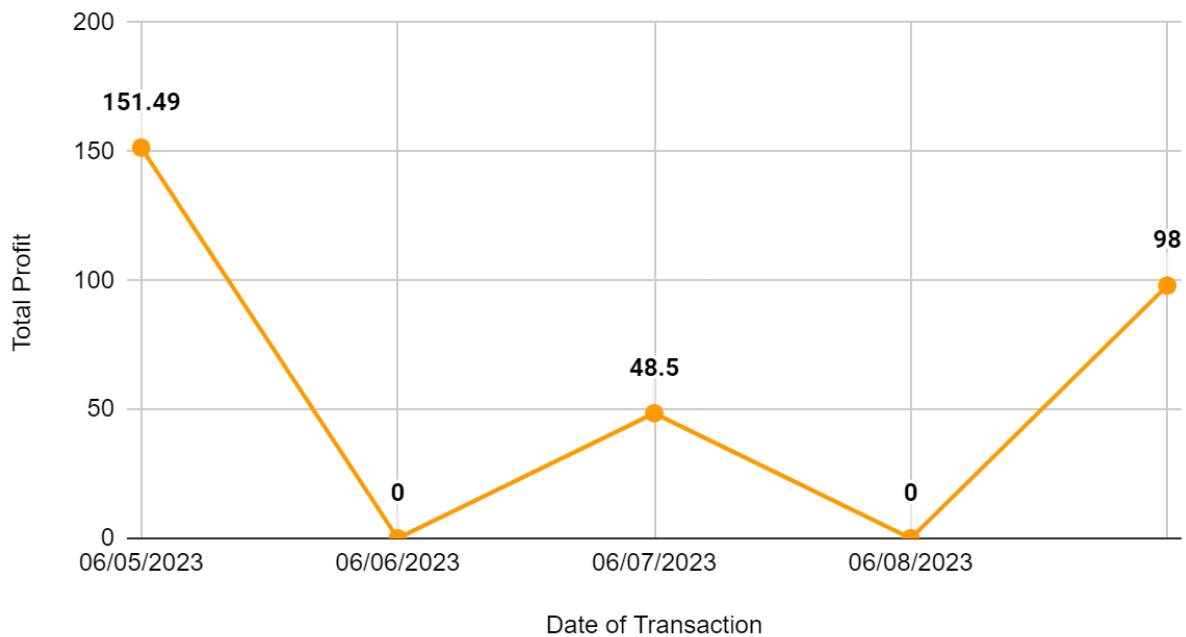


Figure 5.3 Swing Trading Simulation Daily Profit/Loss Week 3

The stocks that kept profits increasing include British Petroleum (BP), Viking Therapeutics (VKTX), and Best Buy (BBY) (See Figure 5.3). The profit increase for this week was \$440.49 adding to a total profit of \$658.56 going into next final week.

5.4 Swing Trading Week 4

This fourth and final week ended with a poor profit performance. Below in Table 5.4 shows the Swing Trading transactions of either profits or losses per day during the fourth week.

Table 5.4 Swing Trading Transactions Week 4

Date of Transaction	Symbol	Buy/Sell	Price (USD)	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profits
06/12/2023	VKTX	Buy	24.27	200	4,853.70	***	82,281.38	
06/13/2023	RIO	Sell	65.52	100	6,551.50	124	88,832.88	782.56
06/13/2023	AAPL	Buy	183.19	50	9,159.50	***	73,121.88	
06/14/2023	AAPL	Sell	184.28	50	9,213.75	50.25	82,590.13	832.81
06/14/2023	AMZN	Buy	126.35	50	6,318.00	***	79,272.00	
06/14/2023	AMZN	Sell	126.37	50	6,318.25	0.25	82590.38	833.06
06/16/2023	BP	Sell	35.45	200	7,089.00	-16		817.06
06/16/2023	VKTX	Sell	21.41	200	4,282.00	-566.2		250.86

The beginning of the week trades begin well with a maximum \$124.00 profit on Tuesday. Although leading into the end of the week Friday stock trades cut into profits heavily. The total profits declined from \$817.06 to \$250.86 at market close on Friday (See Table 5.4). Figure 5.4 below shows the total profit per day from Monday till market closure on Friday during the full fourth and final week.

Swing Trading Transactions Week 4

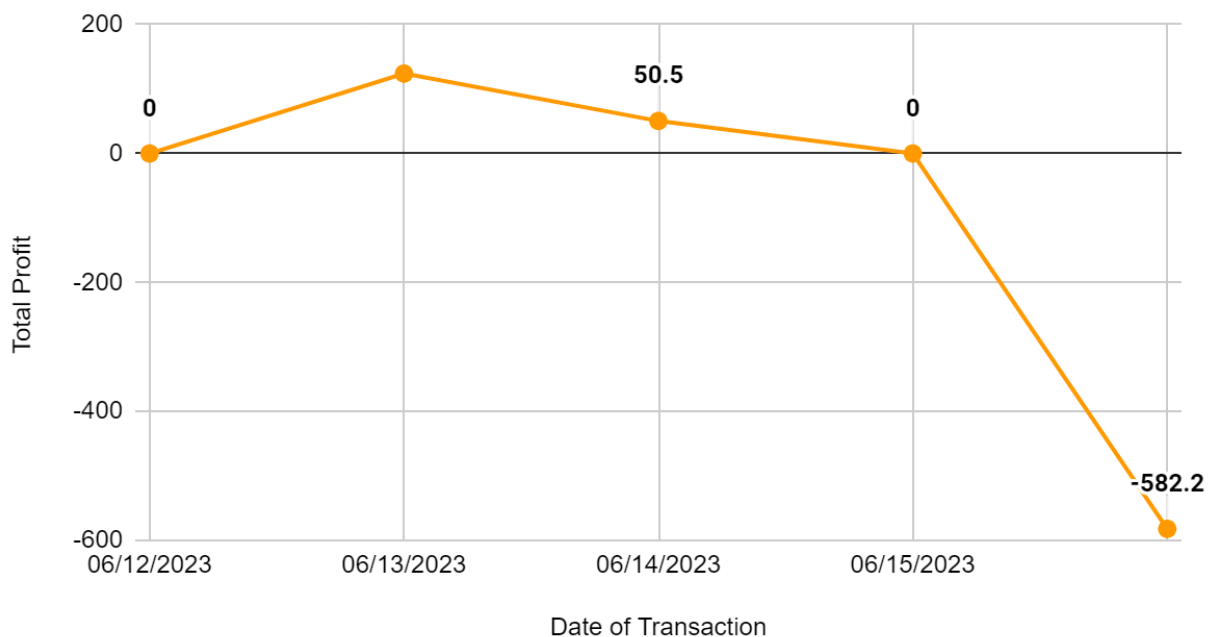


Figure 5.4 Swing Trading Simulation Daily Profit/Loss Week 4

Attempting to buy more stocks in British Petroleum (BP) to replicate the profit made last week led to a decline in stock price from the opening of the market on Monday to Friday. The only luck for the British Petroleum (BP) stock I had was at the end of Friday the price shot up just enough to cut my losses with a -\$16.00 profit. Although I was surprised that my safe stock chooses of Roi Tinto (RIO) and Apple (AAPL) raise to a \$174.25 profit in the mid-week. With my investment in Viking Therapeutics (VKTX), however, it took a drastic downturn (See Figure 5.4). The past success of such stock led to a belief that reinvestment would create an increase in profits. Viking Therapeutics (VKTX) stock began to decline the moment the purchase was made from \$24.27 per share to \$21.41 per share at the end of week. Within the parameters of the simulation there was a -\$566.20 profit with Viking Therapeutics (VKTX) stocks. Leading to a fourth and final week ending with a near wipe of origin total value of \$833.06 to a \$250.86 profit for swing trading.

5.6 Overview of Swing Trading past 4 weeks

The Swing Trading simulations over the past 4 weeks lead to a \$250.86 profit. Figure 5.6 below shows the profits at the end of each week at market closing on Friday.

Swing Trading Total Profits

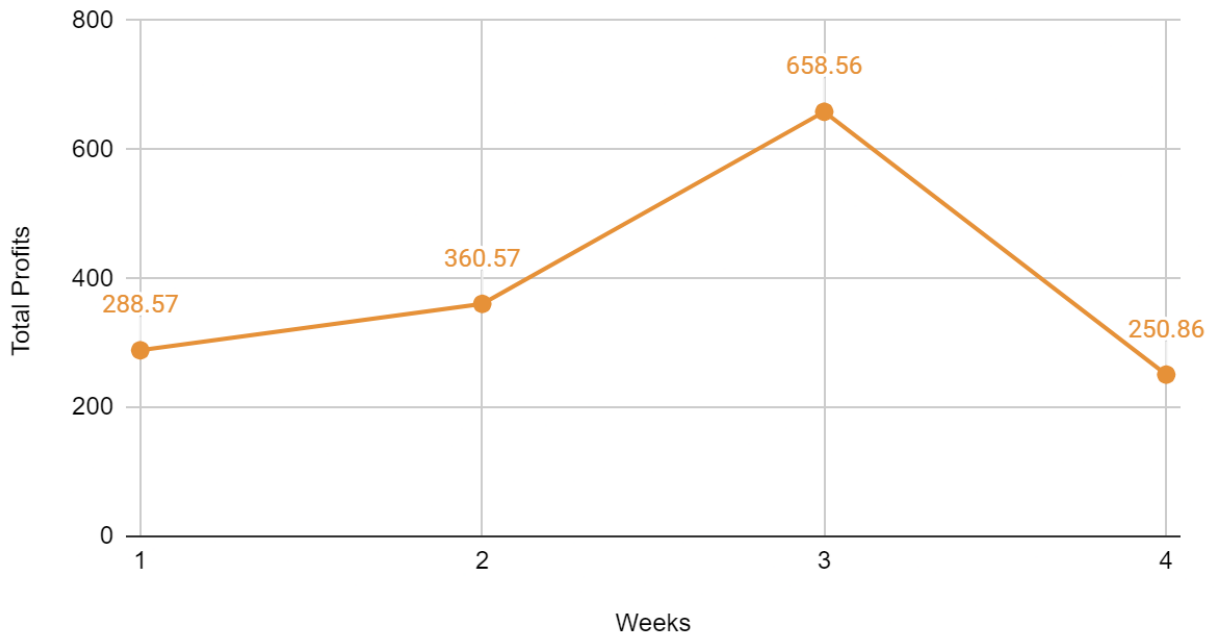


Figure 5.6 Swing Trading Total Profits Per Week

The stocks bought and sold under Swing Trading during the current events and uncertainties of the market made a possibility for profit even after setbacks (See Figure 5.6). The stock of Roi Tinto (RIO) and British Petroleum (BP) provide the highest earning profits for the whole simulations, totaling over the 4 weeks profits which are \$274 and \$220 respectively. The stock of Viking Therapeutics (VKTX) and Shockwave Medical (SWAV) was responsible for the significant decrease in profits during the whole swing trading simulation, totaling over the 4 weeks

a -\$566.20 and -\$94.01 profits. Though there are other stocks that had either been slightly profitable or not but didn't have the impact that affected profits greatly to be concerned.

Chapter 6 – Analysis and Comparison

Chapter 6 will focus on the summaries of both investing strategies. The breakdown will consist of the total profits over the time commitment and ease of learning with implementation. With a comparison considering all pros and cons on which investment strategy would have the highest probability of returning profits gaining average consistency.

6.1 Buy & Hold Summary

The Buy and Hold investment strategy was simulated for a total of 4 weeks. This strategy was flexible with its time commitment as one's stocks were chosen and investments made, patience was the risk and in this simulation reward for this strategy. The Buy and Hold strategy risk is mainly placed on the global events and companies chosen. Since global events are difficult to predict, researching the right companies for increased chance of success in gain an increase in profits is important. With research for companies chosen has had the significant impact on the profitability of the investments made. With the long-term strategy applied over the simulation period

During the beginning and end of simulation period certain investments had a strong influence on profit gains. Such stock investments can be credited to both researching company products along with future plans and news reports on the company's adaptability to economy changes due to current events outside of individual control. The stock of Amazon.com (AMZN) illustrates a beneficial choose in companies added to an investment portfolio which has consistent growth. Figure 6.1 below shows the total profit gains or losses for the Amazon.com (AMZN) stocks at the end of every week.

Amazon.com (AMZN)

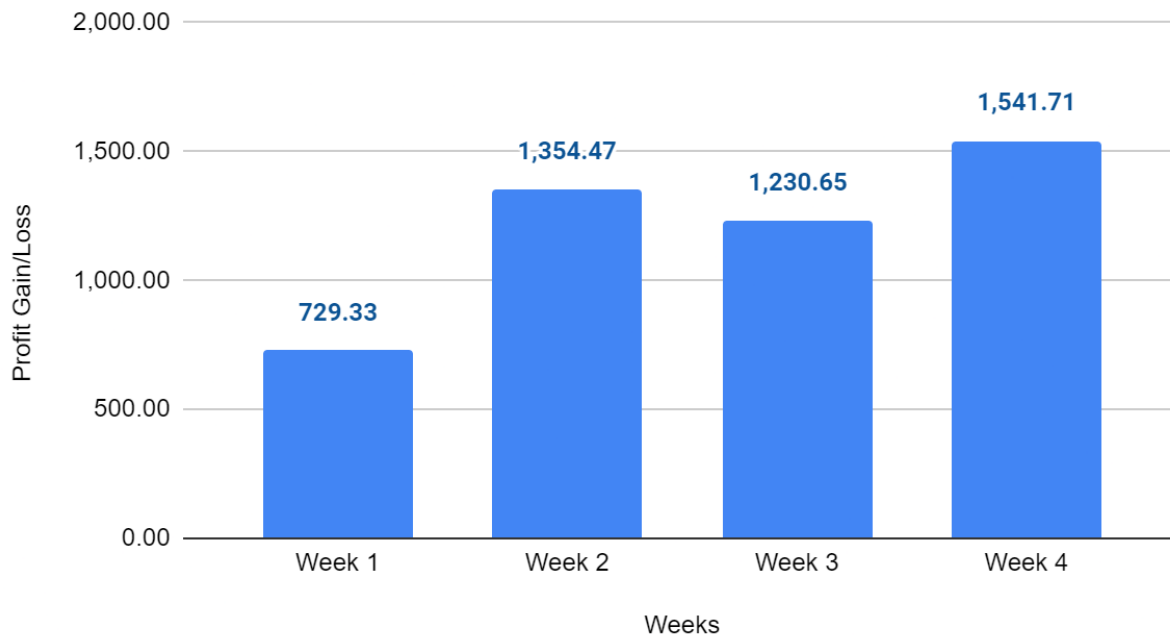


Figure 6.1 Amazon.com (AMZN) Stock Profit Gains/Losses per Week

The Amazon.com (AMZN) is a large company based on both retail and production while having an online presence for ease of access. Due to the unique nature of the company lead to it coming out of the pandemic with a stronger grasp on its owned sectors of the economy. Including the future endeavors of expiation into other economic sectors to create more revenue flexibility. Under such circumstances, Amazon.com (AMZN) is taking advantage of current events for further profits for itself. The company actions in such events have a increased probability of profits gains for investors who own their stocks. Observing the profit gains from the 4-week simulation demonstrates the belief in Amazon.com (AMZN) increasing value from the market's perspective and the upper managements competence growing the company (See Figure 6.1). This stock in the simulations shows a safe investment choose over the long-term for its consistent return in profits for all weeks which can be difficult to predict even after research.

The use of the Buy and Hold method over the simulation period has shown its advantages over specific stocks. The advantage of this investment method can be observed through the benefits of a long-term investment plan. If stocks were purchased and begins to produce a profit loss in the short-term, patiently observing the stock market through the lens of long-term investing can turn a profit loss to a profit gain. Thus, leading said stocks to becoming part of the investment portfolio backbone in lessening the effects of profit losses. Such an example includes stock price changes of the company ShockWave Medical (SWAV). Figure 6.2 below shows the combined value of the investments of ShockWave Medical (SWAV) stocks per week at market closer on Friday.

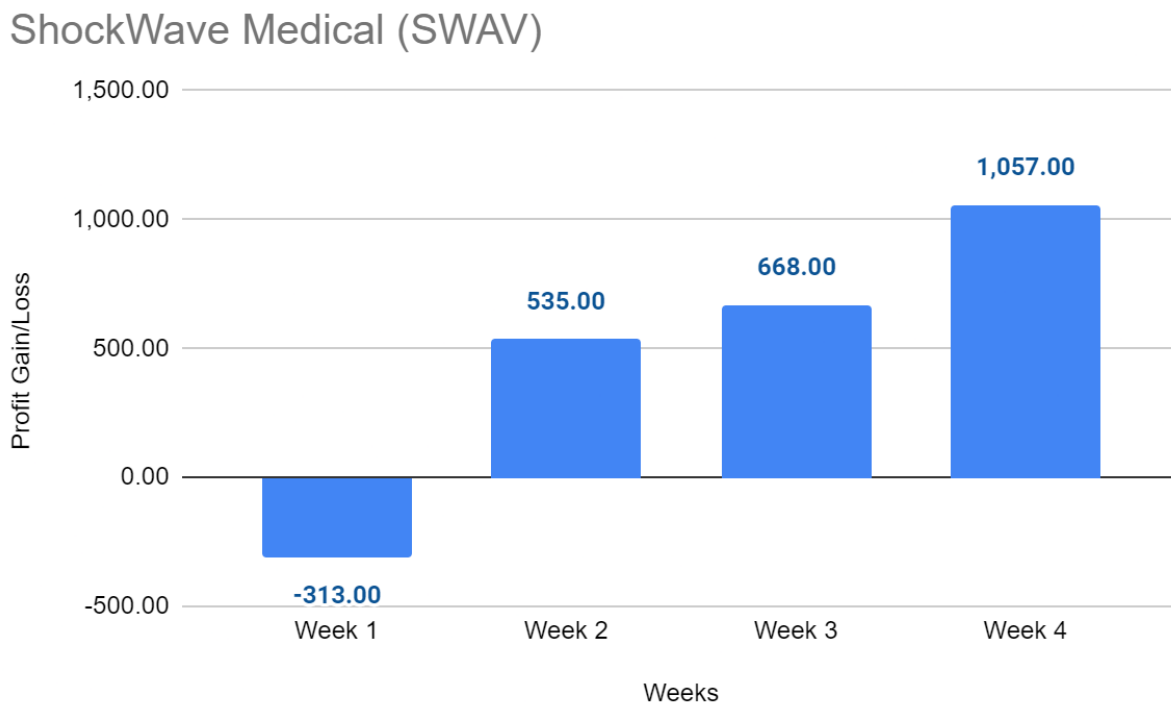


Figure 6.2 ShockWave Medical (SWAV) Stock Profit Gains/Losses per Week

The ShockWave Medical (SWAV) company has gained a growing interest in their research, specifically Boston Medical Cop. sees potential in the medical company. With a deal

between the companies in the works. Such events can either create optimism or pessimism toward ShockWave Medical (SWAV) investments. The profits from the simulation on the company stock price changes seems to show these feelings (See Figure 6.2). With the first week returning a profit loss for possible caution while the remaining weeks had a profit gains seeming due to potential seen by investors.

The success of the Buy and Hold method also has it failures during the simulation. A disadvantage a long-term can be if stock prices after purchase continue to decline in prices. The prices may fluctuate within a profit loss but ultimately the stock becomes a weight on the whole of the investment portfolio. With the complexity of the stock market, nailing down a primary factor as the cause of market changes is difficult. A factor seemingly observed within the simulation period is a stabilizing reaction still effecting the market at the end of the pandemic which led to an unfavorable timing of stock purchases. The British Petroleum (BP) stock shows this effect prominently. Figure 6.3 below shows the combined value of the investments of British Petroleum (BP) stocks per week at market closer on Friday.

British Petroleum (BP)

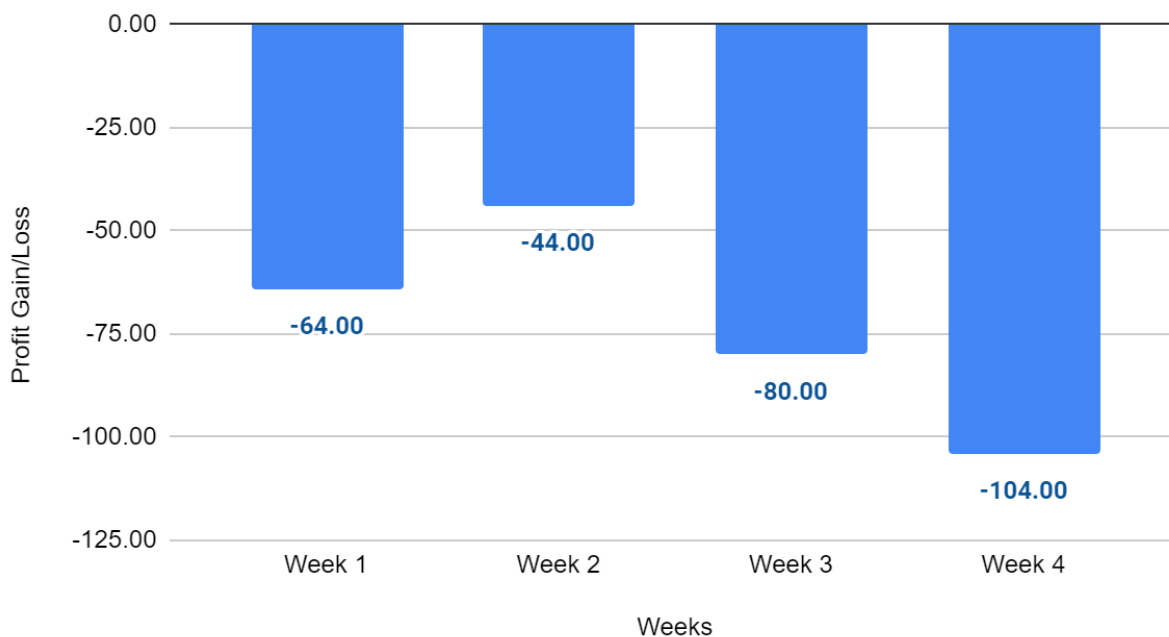


Figure 6.3 British Petroleum (BP) Stock Profit Gains/Losses per Week

The British Petroleum (BP) company was hit hard during and after the pandemic. With the decrease on the consumption of oil caused the post pandemic recover to be difficult. It could be from people becoming accustomed to not driving but either way the stock prices hadn't increased as hoped from researching.

6.2 Swing Trading Summary

The Swing Trading investment strategy was simulated for a total of 4 weeks. This strategy requires vast time commitment with how short-term strategies are used in market applications. The Swing Trading strategy is greatly affected by the uncertainty of the markets along with the speed to when stock prices change, and stocks sold. A level of patience is required to allow market change to take effect, but it runs the risk of stock prices declining.

The Swing Trading strategy during the simulation period showed the advantage of this investment method. This investment method uses the short-term stock price changes updated as quickly as possible. The updating speed of stock changes are key for catching a favourable price of stock to sell. Along with the speed of the selling transaction being processing and completed. When all factors on the software and individual investors are working as quickly as information can travel, the probability of profit gains can increase. Though being more of a hands-on investment method means increased factors and reaction that can't be controlled must be offset by increased investors preparedness. Such an example of this advantage in practice is observed in the profits of the Rio Triton (RIO) stock. Figure 6.4 below shows the data and profits for the selling transaction of purchased Rio Triton (RIO) stocks over the simulation period.

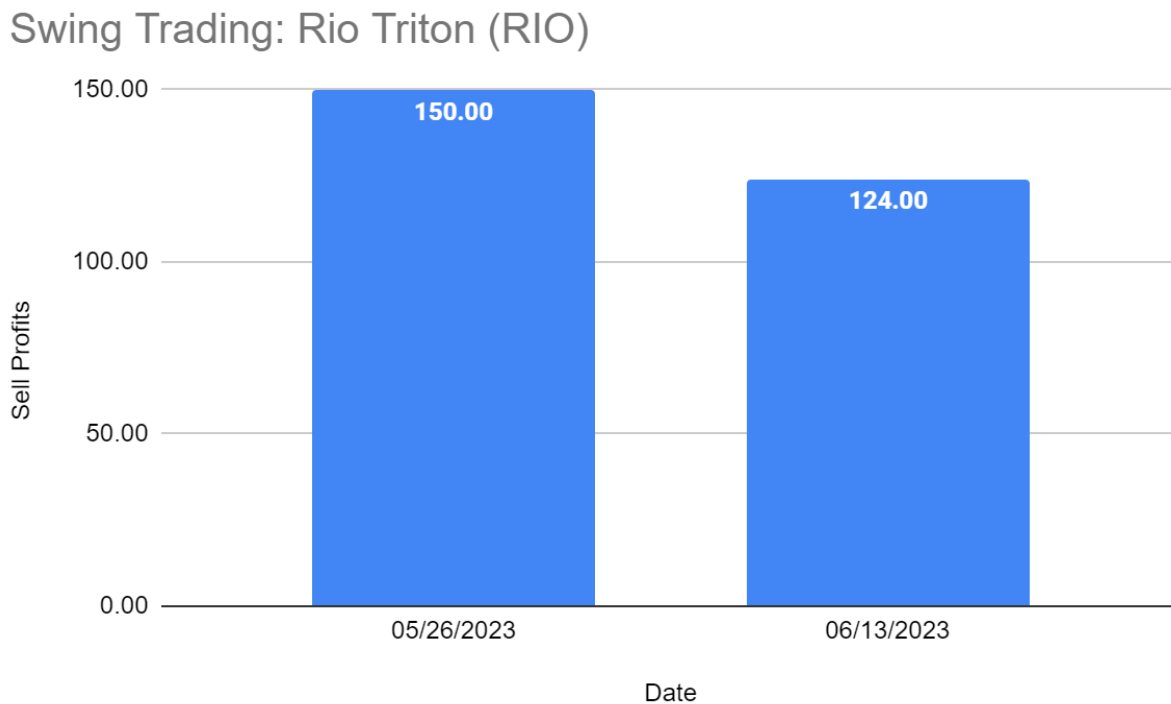


Figure 6.4 Rio Triton (RIO) Data and Profits of Selling Transactions

The company of Rio Triton (RIO) is sector specific in minerals involving extraction and refinement. After the pandemic the company had both recovering and back sliding for their stocks. The uncertainty within the market causing investors to either see concern or opportunity can explain such stock reaction. The Swing Trading strategy used in such a volatile time for the market was what the investment method needs for increased profit success. The investments in Rio Triton (RIO) have its stock prices shown to be constantly volatile profit gains (See Figure 6.4). Although there were only two selling transactions made nearly two weeks apart, illustrates the balance between patience and urgency in this investment method. The profit gains would often be in the hundreds as small bursts of investments to limit the potential of drastic profit loss if the market changes unfavorably.

The volatility of the stock market while having its potential for profit gains has the following similar chance of profit loss. The disadvantage of the stock market currently for Swing Trading is the uncertainty for stock investments. As mentioned previously, there is so much a chosen software along with investor vigilance can do to offset the unforeseen variables and reactions that the stock market can be affected by. With the increased risk and reward in such a market climate is where an investor must make at times blind investments by viewing individual stock prices. The constant observations of the stock prices are made to catch the prices decreasing for purchase. The purchasing of the decreased stock price would require investors to watch for any small price increase more then the purchase stock price to have the possibility of profitability. This thin margin for success along with the need to constant monitor purchased stocks can easily break the investment strategy into hitting currently made profits. Such an example of this method's disadvantage hurting an investors pocket is the Viking Therapeutics (VKTX) stocks. Figure 6.5

below shows the data and profits for the selling transaction of purchased Viking Therapeutics (VKTX) stocks over the simulation period.

Swing Trading: Viking Therapeutics (VKTX)

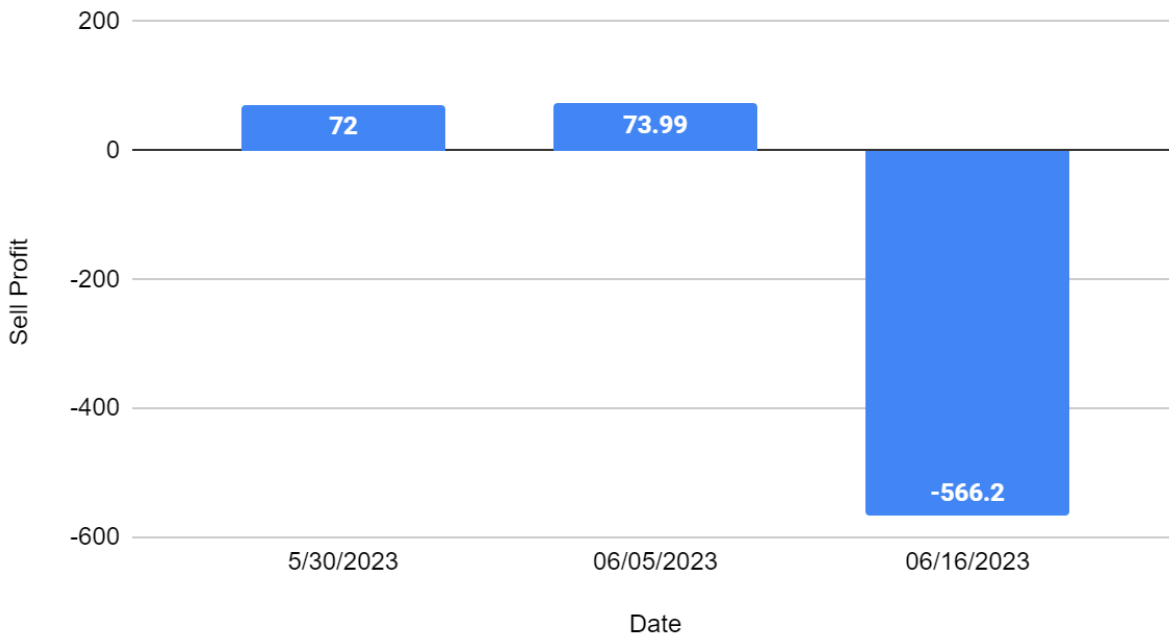


Figure 6.5 Viking Therapeutics (VKTX) Data and Profits of Selling Transactions

The company of Viking Therapeutics (VKTX) is a specialized in the medical sector development of therapeutics to treat disorders in bodily function. Though in Swing Trading the economic sectors a company is not as important as in the Buy and Hold strategy, it can provide some reassurance for stock price increases. In this case, the first two transaction of the Viking Therapeutics (VKTX) stocks had profit gain which eventually on the final transaction shows how much of a profit loss can greatly dent previous profit success (See Figure 6.5). The profit loss that occurred on the 4th week before market closer took more than half of profits made during the total simulation period. This stock example illustrates the possible risk with investors using a strategy

where every price change must be caught, or substantial profit losses will come just as quickly as any stock price change.

6.3 Comparison

The Buy and Hold investment strategy overall is a patient long-term investment strategy. Requiring a heavier emphasis on researching companies either having expanded into multiple economic sectors or specialized into a singular essential sector. Along with the company's management history past and present for increasing the reassurance of investing into a stable company. The diversifying of the portfolio in such a way forms a safety net against investments that become profit losses due to factors outside investors control such as global events. With companies chosen and stock purchased only time will show if an investor has made a viable portfolio for profit gains.

The Swing Trading investment strategy overall is a rapid response short-term investment strategy. Though research done on companies is focus on choosing companies with consistent stock price volatility. This market environment is fundamental in having the stock price changes to either gain or loss profits. The offset of poor performance is reliant on the individual persistence in monitoring stock price changes for transaction opportunities and software update speed of stock market transaction to completion. Due to investor having few factors that are within their control, leads to both see and unseen factors effecting the stock market to also dictate greatly how effective this investment strategy can be for profit gains. With the application of investments, the short-term changes of stock prices with any poor or successful investments will be felt nearly immediately.

The application for both investment strategy's simulation even with a short 4-week period has show both the strength and short comings of each strategy. This is prevalent when observing the differences between each investment strategy's profit gains. Figure 6.6 below shows both

investment strategies total profits each week counted at market closer. The Buy and Hold method is record in the blue and Swing Trading method is record in red along with total profits above the bars respectively.

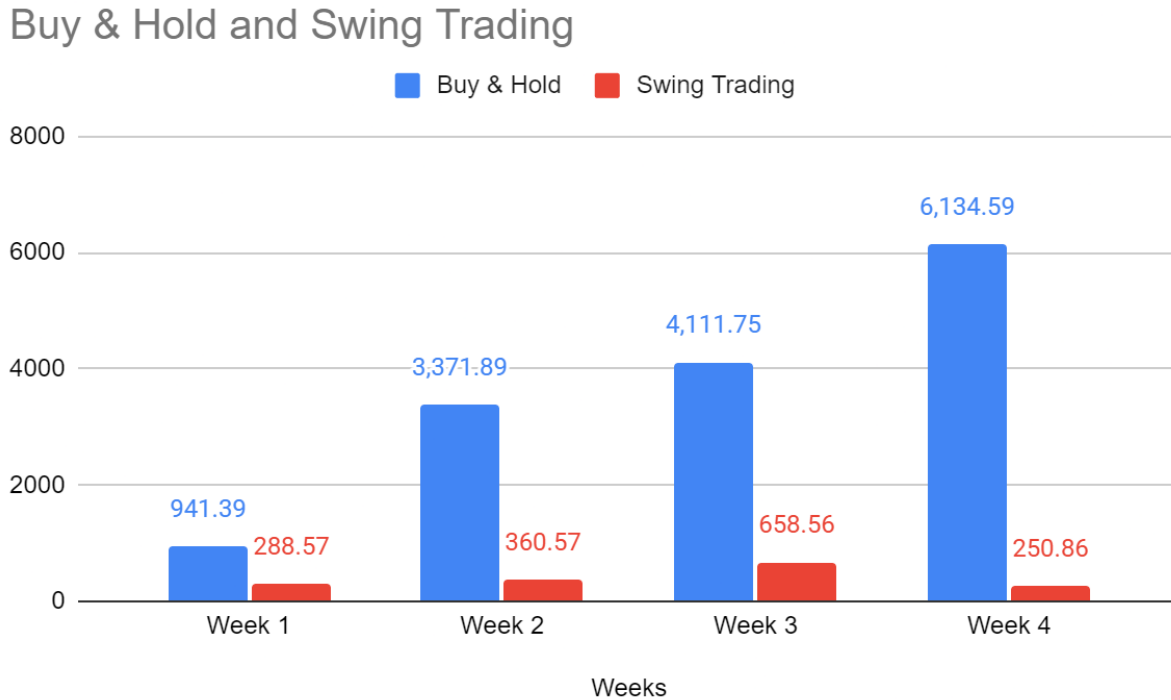


Figure 6.6 Both Investment Strategies Profits Per Week

The performance through profit gains demonstrates for each investment strategy the time commitment for profits and ease of execution. As simulated during the 4 weeks Buy and Hold investments performed consistently well with profits gains while Swing Trading investments struggled to gain profits near Buy and Hold (See Figure 6.6). The contributing factors to Buy and Hold methods success greatly contributed to the factors within investors control. The strategies emphasis toward background research into companies for both performance and future goals provides the increased potential for novice investors chooses favorable stock for long-term investments profits. Along with the passive investment, short-term market changes are less

effective at breaking the Buy and Hold investment strategy. The profitable future potential of stocks allows beginner investors to familiarize themselves with coming emotions and learn from market reactions allowing for large profit gains over an extended period. The Swing Trading however is an advance, unforgiving, and short-term investment strategy for which novices' investors would have a difficult time to pick-up. The difficulty is based on the amount of factors outside of investors control compared to the Buy and Hold investment strategy. This investment strategy needs both rapid software updates for the stock market prices and investors reflex for stock transactions. Along with research into companies not for stable long-term growth but rather for consistent short-term market volatility for stock price changes. The Swing Trading investment strategies requirements for favorable performance is such as a volatile market and swift transactions have the risk that can be extremely unforgiving.

Chapter 7 – Conclusion

The results that can be concluded from this report is the safe investment strategy for novices' investors is Buy and Hold method. The Buy and Hold method has the balance between factors within and without investor control. Along with the benefits of long-term passive strategy larger profit gains can be achieved if well research on companies.

References

1. “Best Buy Co Inc (BBY) Stock Price & News.” Google Finance. Accessed May 19, 2023. <https://www.google.com/finance/quote/BBY:NYSE?window=1Y>.
2. “Apple Inc (AAPL) Stock Price & News.” Google Finance. Accessed May 21, 2023. <https://www.google.com/finance/quote/AAPL:NASDAQ?window=1Y>.
3. “BP Plc (BP) Price & News.” Google Finance. Accessed May 21, 2023. <https://www.google.com/finance/quote/BP:NYSE?window=1Y>.
4. “Pfizer Inc. (PFE) Stock Price & News.” Google Finance. Accessed May 21, 2023. <https://www.google.com/finance/quote/PFE:NYSE?window=1Y>.
5. “Shockwave Medical Inc (SWAV) Stock Price & News.” Google Finance. Accessed May 21, 2023. <https://www.google.com/finance/quote/SWAV:NASDAQ?window=1Y>.
6. “Viking Therapeutics Inc (VKTX) Stock Price & News.” Google Finance. Accessed May 21, 2023. <https://www.google.com/finance/quote/VKTX:NASDAQ?window=1Y>.
7. “Amazon.Com, Inc. (AMZN) Stock Price & News.” Google Finance. Accessed May 22, 2023. <https://www.google.com/finance/quote/AMZN:NASDAQ?window=1Y>.
8. “Rio Tinto Plc ADR Common Stock (Rio) Price & News.” Google Finance. Accessed May 21, 2023. <https://www.google.com/finance/quote/RIO:NYSE?window=1Y>.
9. Beattie, Andrew. “The Birth of Stock Exchanges.” Investopedia, April 5, 2023. <https://www.investopedia.com/articles/07/stock-exchange-history.asp>.
10. Beers, Brian. “What Is Buy and Hold? How the Investing Strategy Works.” Investopedia, November 17, 2022. <https://www.investopedia.com/terms/b/buyandhold.asp>.
11. “Best Buy Co., Inc. - Company Profile, Information, Business Description, History, Background Information on Best Buy Co., Inc.” Reference for Business. Accessed May 21, 2023. <https://www.referenceforbusiness.com/history2/47/Best-Buy-Co-Inc.html>.
12. “Desktop Publishing Revolution.” Encyclopædia Britannica. Accessed May 21, 2023. <https://www.britannica.com/topic/Apple-Inc/Desktop-publishing-revolution>.
13. “Blackberry Ltd (BB) Stock Price & News.” Google Finance. Accessed May 21, 2023. https://www.google.com/finance/quote/BB:TSE?sa=X&ved=2ahUKEwjw9prn4of_AhVopIkEHWP4BPQQ3ecFegQIGRAh&window=MAX.
14. melissa_repko. “Best Buy Is Speeding Changes to Adapt to a Post-Pandemic Consumer: Smaller-and Fewer-Stores Ahead.” CNBC, February 25, 2021. <https://www.cnbc.com/2021/02/25/best-buy-is-speeding-changes-to-adapt-to-a-post-pandemic-consumer.html>.
15. Investopedia. Accessed May 21, 2023. https://www.investopedia.com/simulator/portfolio#state=f3c7128b-5cd5-4f86-8b8c-b21b6e581557&session_state=1948e6d6-2628-46c9-acb4-0aaaeb96334c&code=2f679068-a0a7-4a7c-b63f-651974aed351.1948e6d6-2628-46c9-acb4-0aaaeb96334c.12bddc88-7575-48ef-99f9-f196203e4054.
16. Wbur. “The Epic Rise and Fall of Blackberry.” Here & Now, May 28, 2015. <https://www.wbur.org/hereandnow/2015/05/28/losing-the-signal-blackberry>.
17. Downey, Lucas. “How COVID Affects Apple (AAPL).” Investopedia, August 24, 2021. [https://www.investopedia.com/how-covid-affects-apple-aapl-5198334#:~:text=Apple%20\(AAPL\)%20announced%20that%20it,lot%20of%20Big%20Money%20support](https://www.investopedia.com/how-covid-affects-apple-aapl-5198334#:~:text=Apple%20(AAPL)%20announced%20that%20it,lot%20of%20Big%20Money%20support).

18. Johnson, Allison. “3 Best Stock Market Simulators of 2023.” GOBankingRates, January 10, 2023. <https://www.gobankingrates.com/investing/stocks/stock-market-simulator/>.
19. “Amoco Corporation.” Encyclopædia Britannica. Accessed May 25, 2023. <https://www.britannica.com/topic/Amoco-Corporation>.
20. Meredith, Sam. “Oil Giant BP Reports Highest Profit in 8 Years on Soaring Commodity Prices.” CNBC, February 8, 2022. <https://www.cnbc.com/2022/02/08/bp-earnings-q4-2021.html>.
21. “Pfizer, Inc.” Encyclopædia Britannica, May 25, 2023. <https://www.britannica.com/topic/Pfizer-Inc>.
22. Mitchell, Cory. “Swing Trading: Definition and the Pros and Cons for Investors.” Investopedia, March 11, 2023. <https://www.investopedia.com/terms/s/swingtrading.asp>.
23. “Home Depot Inc (HD) Stock Price & News.” Google Finance. Accessed May 26, 2023. https://www.google.com/finance/quote/HD:NYSE?sa=X&ved=2ahUKewiIy8ubkpP_AhVsj4kEHfI0AMMQ3ecFegQIIhAf&window=1Y.
24. Spencekimball. “The Covid Pandemic Drives Pfizer’s 2022 Revenue to a Record \$100 Billion.” CNBC, February 2, 2023. <https://www.cnbc.com/2023/01/31/the-covid-pandemic-drives-pfizers-2022-revenue-to-a-record-100-billion.html>.
25. “Shockwave Medical Company Profile: Stock Performance & Earnings.” PitchBook. Accessed May 26, 2023. <https://pitchbook.com/profiles/company/58446-10#overview>.
26. News, Bloomberg. “Shockwave Medical Draws Interest from Boston Scientific - BNN Bloomberg.” BNN, April 21, 2023. <https://www.bnnbloomberg.ca/shockwave-medical-draws-interest-from-boston-scientific-1.1910697>.
27. “Viking Therapeutics.” Viking Therapeutics, April 28, 2023. <https://vikingtherapeutics.com/about/>.
28. Viking Therapeutics’s Nash drug succeeds in mid-stage trial, shares jump. Accessed May 28, 2023. <https://financialpost.com/pmn/business-pmn/viking-therapeuticss-nash-drug-succeeds-in-mid-stage-trial-shares-jump>.
29. “Amazon.Com.” Encyclopædia Britannica, May 19, 2023. <https://www.britannica.com/topic/Amazoncom>.
30. “How Mighty Will Amazon Be after the Pandemic?” The Guardian, January 30, 2022. <https://www.theguardian.com/technology/2022/jan/30/how-mighty-will-amazon-be-after-the-pandemic>.
31. Chcom. “Rio Tinto.” CompaniesHistory.com - The largest companies and brands in the world, November 19, 2020. <https://www.companieshistory.com/rio-tinto/>.
32. Rani, Archana. “Rio Tinto 2022 Profit Slumps on Decreased Commodity Prices.” Mining Technology, February 23, 2023. <https://www.mining-technology.com/news/rio-2022-profit-slumps/>.
33. melissa_repko. “Home Depot Posts Worst Revenue Miss in about 20 Years, Lowers Forecast as Consumers Delay Big Projects.” CNBC, May 16, 2023. <https://www.cnbc.com/2023/05/16/home-depot-hd-earnings-q1-2023.html>.
34. Harper, David R. “What Drives the Stock Market?” Investopedia, April 5, 2023. <https://www.investopedia.com/articles/basics/04/100804.asp>.
35. Williams, Ward. “Timeline of U.S. Stock Market Crashes.” Investopedia, June 13, 2023. <https://www.investopedia.com/timeline-of-stock-market-crashes-5217820>.
36. Bradley, Chris, and Peter Stumpner. “The Impact of Covid-19 on Capital Markets, One Year In.” McKinsey & Company, March 10, 2021.

<https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/the-impact-of-covid-19-on-capital-markets-one-year-in>.

37. Luis Melgar, David J. Lynch. "See Just How Bad a Year It Was for Your Retirement Account - and Why." The Washington Post, December 30, 2022. <https://www.washingtonpost.com/business/interactive/2022/stock-market-sp500-down-this-year/>.
38. Team, T. I. (2023, June 15). *Recession: What is it and what causes it*. Investopedia. <https://www.investopedia.com/terms/r/recession.asp>
- 39.