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Stock Market Simulation

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Abstract

The goal of this project was to gain a better understanding of the effects that real-world events and different trading strategies have on stock market investing by conducting a four-week stock-market simulation. Two stock trading methods were used in the simulation, namely the Swing Trading strategy and the Buy and Hold strategy. These two strategies were used in simulations performed across 6 total selected companies with 2 portfolios consisting of 3 companies each. Each of these portfolios was allotted \$50,000 as an initial investment. The two portfolios ended with a gain of 0.2% for the Swing Trading method and 1% for the Buy and Hold Trading method. The corresponding S&P 500 index change in value during the course of the simulation went down by 7%. These results signify that the Buy and Hold Trading method profited more than the Swing Trading method, though it is worth mentioning both methods beat the market. The experience and knowledge attained throughout this project will allow for a better understanding of stock market investing and perform investing with more competence in the near future.

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1. Introduction

The overall goal of this research project is to develop the ability to become an efficient and effective stock market investor through extensive research of the fundamental strategies and skills necessary to conduct successful investing. It should without a doubt be understood that prior to beginning our investment simulation, time dedicated to the gathering of information and background regarding the stock market takes priority and is an undeniably large and important part of the focus of this project. The approach I will take to move forward with the completion of this specific Interactive Qualifying Project is to first examine the history of how the stock market came to be, and through that process then delve into identifying certain factors of influence on stock market trends along with the level of impact that real-world events bring to said trends. Moving forward from background analyses, I will then conduct some more in-depth research on techniques that experienced traders use to assess and analyse stock prices and values, along with purchasing those stocks themselves. After I am satisfied that I have committed the most thorough research possible by way of research through textbooks and the internet, I will begin the main focus of this project - the simulation.

The simulation itself will consist of first identifying 8-10 publicly traded companies within the continental United States, and then running 2-3 separate simulations in order to compare efficiency, with the difference being the trading method utilised by each simulation thread. Towards the end of this simulation period, I will then begin to conduct a thorough assessment of each simulation's result to understand how and why trends change, their primary influencing causes, and how those causes are potentially mitigated. By the end of this project, I am hopeful

that I will have learned some undoubtedly useful skills and gained some experience in how the stock market functions to help both others and myself in making better investment decisions.

1.1 Stock Market History

1.1.1 The First Ever Stock Exchange

When the words “Stock Market” are uttered, one naturally thinks straight of an entity such as the New York Stock Exchange (NYSE), and while the NYSE is arguably the most powerful stock exchange in the world [1], it was not the first exchange to have an influence over the market as a whole. The earliest dated beginnings of what is now referred to as the stock market date back hundreds of years to at least the late 1300s, where Venetian moneylenders would exchange debts and loans for different ones with other entities or individuals. Then slightly later on in the 1500s in Europe, the first stock exchange by definition was founded in Antwerp, Belgium, where investors and brokers would exchange debts by way of promissory notes and bonds - sometimes even with the government [2]. No official stocks were exchanged in Antwerp however, as there did not exist any official “shares” at that time. Despite this, many business-financier partnerships still procured income similar to how stocks would today.

In the 1600s, three European governments - namely the Dutch, British, and French governments, all provided charters to companies with transportation missions to East Asia. Long voyages by sea were especially dangerous during that time, as the risk of poor navigation and even poorer weather were all too real. These were in addition to the less common but very genuine risk of an attack from Barbary pirates, making the risk of ship owners losing their ships and profits very likely. An idea was then put to action, where ship owners could mitigate the risk of a lost ship by seeking investors willing to endorse the trip with money. The investors would receive a portion

of the proceeds if the voyage ended in success, and nothing if it failed. Some investors even created their own very primitive versions of mutual funds through investing in multiple voyages to lessen their losses should any one of the voyages fail.

Understandably, these trades were all on physical documents which at the time made transactions between investors fast and simple. A clearly evident problem however was the lack of rules and regulations that came with issuing shares on paper, resulting in an eventual burst of this primitive stock market bubble when those voyage companies failed to pay back investors' shares. Not all was bad, however, as the first official government-regulated stock exchange was launched years later in 1773. Twenty years later, the New York Stock Exchange was launched in a similar fashion in the United States of America, quickly becoming the biggest and most prevalent stock exchange in the world [3].

1.1.2 The Stock Market Crash of 1929

To begin explaining the stock market crash of 1929, we must first acknowledge the economically renowned event of the Great Depression. As an event with repercussions that echoed worldwide, the Great Depression sent economic shockwaves throughout the whole of the developed world. Noted as the worst economic downturn in the history of the industrialised world [4], the Great Depression ran for a period of 10 years between 1929 and 1939. At its worst point, 15 million American citizens were left unemployed along with almost half of the country's established banks. At the New York Stock Exchange on Wall Street in New York City, under investments from numerous speculating white and blue-collar citizens, the stock market rapidly expanded, reaching its peak in August 1929 [5]. At that time, production was already at its lowest, and unemployment was rising, leaving stock values much higher than their actual worth. Consumer spending slowed and unsold goods began piling up, resulting in slowed factory production [6].

Stock prices, however, continued to rise, and near the end of that same year had achieved phenomenally unbelievable levels unjustifiable by projected future earnings.

In late October of 1929, the first major dip in stocks was observed. Nervous investors and those with a keen eye began selling evidently overpriced shares by the boatload. Almost 13 million shares were traded that day, known colloquially as “Black Thursday”. Just five short days later, the second wave, “Black Tuesday” happened. 16 million shares were traded this time, leaving millions of shares completely worthless. What complicated matters further were the investors that had bought stocks with borrowed money. Not only did the mass amounts of money borrowed disappear into thin air, but they were also never truly earned and thus left the economic “food chain” in a state of disarray. Consumer confidence vanished in the wake of the crash, and a decrease in spending led businesses and factories to halt operations and begin downsizing [7]. Those lucky enough to remain employed had their wages decreased, corresponding to a decrease in buying power. Americans forced to live on credit fell deep into debt, and the number of foreclosures and repossessions climbed [8].

The effects of the 1929 Stock Market Crash lasted much up to and even into the Second World War. Roosevelt’s decision to provide assistance to Britain and France resulted in a heavy increase in defence manufacturing, producing more and more private-sector jobs [9]. Redemption came when the Japanese attacked Pearl Harbor in December of 1941. The United States began fully concentrating production on aiding the war effort, and the industrial boost in production along with the conscription of US citizens reduced the unemployment rate to below even the pre-Depression level [10].

1.2 Present Day Stock Market

1.2.1 Recent Events - COVID19

Since late 2019, the world has not been the same. The COVID-19 pandemic has not only changed our way of life but has also had profound economic impacts around the globe. In December of 2019, the World Health Organisation (WHO) in China received reports of cases of pneumonia with an unknown cause. These cases were detected in the city of Wuhan, Hebei Province and presumed to have come from the local Huanan Seafood Wholesale Market. In February 2020, the WHO announces the official name for the disease that caused the 2019 novel coronavirus outbreak: COVID-19 [11]. A month later in March, the WHO officially declared COVID-19 a pandemic. Several U.S. states began shutting down to prevent the spread of the disease following announcements from both the Federal Government and the Centres for Disease Control and Prevention (CDC). As the death toll started to climb around the world, countries scrambled to try and create a vaccine. On December 11, 2020, the Food and Drug Administration (FDA) issues an Emergency Use Authorisation for the first COVID-19 vaccine [12], marking the beginning of a gradual decline in the volatility of the spread of COVID-19 in America. From 2020 until 2022, variants of the coronavirus began to spring up across the world, leading some to believe that the pandemic would never end.

In the years since COVID-19, the world and the people in it have evolved. For those involved in the stock market, their journey has been one full of ups and downs. Stock trading since the beginning of the pandemic has seen some companies rise at incredible rates, and others indefinitely fall. All sectors began to observe rapid declines during the first month of the crisis, and with the lack of good news, there appeared to be no end in sight. Fortunately, the tide began

to turn when in March governments began responding with record stimulus packages, and in June sectors with heavy involvement in tackling COVID-19 managed to fully regain their initial market losses [13]. As COVID-19 began settling its way into our daily lives, so too did nerves regarding the effects of the virus on financial steadiness. Following numerous rounds of government-granted stimulus packages, gradual improvements in stock market trends for all sectors were observed. That is not to say the stock market fully recovered however, to this day many industries still feel much of the effects that the coronavirus had on their production. The pandemic has since forced leaders in the business world to envision a post-COVID-19 future [14], where continuing uncertainty is extremely likely, and inevitable aftershocks must be accounted for and dealt with accordingly.

1.2.2 Ukraine-Russia Conflict

On February 24th 2022, Russia began its invasion of Ukraine. This was part of the Russo-Ukrainian War that had begun digging its roots back in 2014. This invasion of Ukraine seemingly devastated global markets. Adding on to the recent Covid-destabilised markets, global sanctions on Russia and the ongoing events taking place in Ukraine have only made the navigation of stock markets more difficult [15]. In response to this invasion of Ukraine, the United States of America along with the G7 and European Union began a series of sanctions against Russia in an effort to impose severe economic costs to the country. These sanctions have inflicted much pain on Russian businesses, visible from their recently collapsing stock prices. While international investors focusing primarily on markets outside of Russia have minimal exposure to this situation, there are many businesses that have announced partial or full halts in their operations within Russia. Investors in these businesses, such as those invested in McDonald's, would be at unease from the potential of lower revenues by the withdrawals from Russia. Despite many of the sanctions being

against Russia and Russian-centric businesses, investors in current stock markets still perform by a more “play-it-safe” and “wait-and-see” approach due to the already increased amounts of tension and anxiety caused by Covid-19.

2. Trading Methodology

2.1 Types of Trading

This section will focus on two different types of trading, namely Swing trading and Day trading. After conducting thorough research and with inspiration from both my colleagues and Professor Tang, I have decided to run simulations on both Swing and Day trading, after which the results and data from these simulations will be compared both in terms of efficiency and profit.

2.1.1 Swing Trading (Overview)

Swing Trading is a method of trading where traders will hold stocks for longer periods of time, usually ranging from a day to several weeks. Swing trading allows investors time to identify trends in the market, and trade for profits on both the upwards (uptrend) and downwards (downtrend) trends. To effectively conduct swing trading, traders must protect themselves by noting where a counter-trend (seen as an inflection point where an uptrend and downtrend occur in sequence) may occur, and avoid entering then. By examining the lowest point in a downtrend, traders may mediate the significance of any potential losses by exiting the market when a stock decreases under a “stop out” point. Similarly, by examining the highest point of an uptrend, traders are able to determine a target of profit [16].

Research indicates that an entry-level approach to determine when to enter the market for maximum profit occurs when one calculates the reward-to-risk ratio. If the potential profit to loss ratio is significantly positive, say double, then the trade can be considered. Exit time depends entirely on the trader, however, a good rule of thumb is to at least sell portions of a stock when the target price is met in order to guarantee some returns.

2.1.2 Buy and Hold Trading (Overview)

Buy and Hold is a method of trading similar to Swing, where traders will buy stocks and hold them for a period of time. The difference here is the length of time that they hold the stocks for, in addition to the fact that the stocks are held for that period of time regardless of fluctuations in the market. In short, investors that use buy-and-hold strategies actively select investments, but have no concern for short-term price movements or technical indicators [17]. The buy-and-hold strategy capitalises on the conventional idea that over a long time, equities will render higher returns than other asset classes such as bonds. And while there is some debate over the superiority of either active or passive (buy-and-hold being one) strategies, a buy-and-hold strategy has indubitable tax benefits because the investor is able to defer capital gains taxes on long-term investments [18].

The simplicity and long-term reality of the buy-and-hold strategy also means that the investor, if purchasing enough shares of a common stock, takes ownership of that stock's business. Ownership comes with voting rights, in addition to decision-making on what the direction of the company should be heading in. Due to this, shareholders committed in a company will adopt the buy-and-hold strategy, treating their investment as something they can cultivate rather than use and dispose. Shareholders will however need to bear either the ultimate risk of failure, or the ultimate reward of success [19].

2.2 Types of Data Analysis

When delving into Data Analysis, we must first analyse and understand the different types of data analysis methods more commonly used when deciding on an investment or investment strategy. For this paper on investment simulations, we will focus on two data analysis methods

very commonly used in investment decisions. First is the Fundamental Analysis method, which focuses on data that is measurable both qualitatively and quantitatively. The data gathered comes primarily from the company that is being analysed, and the industry or industries in which the company operates. The second data analysis method is known as Technical Analysis, where a more statistical and numerical analysis of current public stock price trends and movements is used to determine investment decisions.

2.2.1 Fundamental (Real Value) Analysis

Fundamental Analysis (FA) is very commonly used as a method of measuring a security's intrinsic value by examining related economic and financial factors [20]. An understandably important factor for any data analysis method in relation to stocks is the ability to quantitatively analyse data regarding the company with which one is contemplating buying stock from. Elements such as the company's financial records, cash flow, liquidity, and profitability are especially taken into consideration when analysing quantitatively.

This simulation will take into account Price to Earnings, specifically the ratio, as the primary factor when deciding on a stock to purchase. Other quantitative factors such as the profitability ratio and company financial records will also be accounted for when making a purchase decision, as well as more qualitative factors such as real-world company news and events. The Price to Earnings ratio will be calculated using the formula given below. This factor for analysis is currently the most established and well-known valuation method for stock investment, where a lower ratio resembles less risk, and vice versa.

$$\text{Price to Earnings Ratio} = \frac{\text{Price per share (Market Value)}}{\text{Earnings per share (Actual or Projected)}} \quad (1)$$

Additionally, the profitability ratio will be established through the calculation of the Net Profit Margin (NPM). Our NPM will be calculated through the equation given below:

$$\text{Net Profit Margin} = \frac{\text{Net Income}}{\text{Revenue}} \quad (2)$$

In Fundamental Analysis, we must also consider the qualitative aspects of a company when deciding on their stock. We can very loosely define qualitative as the nature or standard of something [21] in contrast to quantitative where that thing can be quantified by a number. Correspondingly, the factors considered for qualitative data would be different to the methods described in the paragraph above. Investment analysts commonly consider four fundamental qualitative data factors regarding a company: the business model, competitive advantage, management, and corporate governance [22]. The business model describes what business the company is in, or what it does. The business model analysis is not as simple as just figuring out what the company does at a surface level however, as the company could be more profitable from ventures that build on the presented model itself (think supermarkets such as Costco or Sam's Club and their membership fees).

2.2.2 Technical Analysis

Technical Analysis is another very commonly used data analysis method that focuses heavily on analysing the quantitative aspect of a company's stocks and securities. By focusing more on numbers, analysts evaluate investments and identify opportunities for trade through statistical trends gathered from trading activity, such as price movement and volume [23]. Dissimilar to the numerical aspect of fundamental analysis where focus is more heavily applied to sales and earnings, technical analysis focuses predominantly on study of the price and volume of a stock. This paper will analyse the selected companies' stock performance and perform

calculations based on the technical analysis idea of trends repeating themselves along with the predicted trend distributions therein.

Technical analysis is applicable to any company with existing historical trading data, since a lot of the fundamental assumptions revolve around analysing past trends and predicting future curves. The historical trade data analysed can include stocks, futures, commodities, and currencies among other securities [24]. As such, technical analysis is used more commonly in commodities and forex markets where traders and analysts focus on short-term price movements and effects. The use of technical analysis is not just available for use in stocks however, as any tradable item that is subject to forces of supply and demand and has visible historical trading data is subject to such analysis. This includes but is not limited to stocks, bonds, futures, and currency pairs [25].

American journalist Charles Dow, co-founder of The Wall Street Journal, released at the time a series of editorials that discussed some of the technical analysis theory [26]. His editorials and writing described two basic assumptions that to this day lay the foundation for the approach to technical analysis trading. As per Adam Hayes from Investopedia.com on the work of Dow:

- (1) Markets are efficient with values representing factors that influence a security's price
- (2) Random market price movements appear to move in identifiable patterns and trends that tend to repeat over time

Expanding on these two fundamental assumptions, analysts in today's field of data analysis using the technical analysis approach accept three general assumptions that build upon Dow's work:

- (1) The price of a stock is inclusive of everything regarding a company's fundamentals to broad market factors and market psychology. The only remaining things that can be

analysed are the fluctuations in price, viewed also as the product of supply and demand for a particular stock in the market.

- (2) Stock prices, even in apparent observed random market movements, will exhibit trends irrespective of the time frame it is observed in. Simply put, a stock price is more likely to exhibit changes similar to that of a past trend than move spontaneously continuously.
- (3) Similar to point two: Stock history will tend to repeat itself. Technical Analysts believe that history will often tend to repeat itself. This repetitive nature of price fluctuations is often attributed to market psychology, where fear and excitement of stock sales and purchases account for the repeating behaviour in trends.

While Technical Analysis isn't perfect, it is still very commonly used to analyse trends in the stock market, and is one of the most sure-fire ways of performing quantitative data analysis on the stock trends.

2.2.3 Simulation Results Analysis

The description of the data analysis methods above will play a part in defining the analysis of the results from the stock market simulation run throughout this paper. I will attempt to analyse the data and results I've gathered throughout this experiment to learn more about how the stock market functions and acquire more familiarisation with the intricacies of stock trends and the effects that external events have on the stock market. A detailed summary will be provided towards the end of this paper analysing the different progressions made throughout the simulation and the trends the market has observed. By analysing the data collected throughout the four-week simulation process, I hope to be able to identify the most time and cost-effective way of profiting from trading stocks. My progress over the weeks will be documented per week in their corresponding sections in the following chapter, and a brief analysis will be conducted

predominantly by looking at the quantitative data gathered, in addition to looking at tables and graphs of the market progression in the stocks I've selected.

3. Stock and Company Selection

Selecting a stock for investment was a very important area of consideration before going forward with the simulation itself. Just like in the real world, a lot of factors of consideration were taken into account before deciding on a company. I analysed a few different factors for consideration, such as the intrinsic value of the stock itself, company strategies for growth, plans for diversification, and any potential associated risk factors before deciding on the final six companies.

3.1 Company Finances

When looking at a company, especially in terms of potential for growth and factors of risk, it is necessary to examine not just the quantifiable aspects of their business but also look at events occurring in the real world that may have an inevitable effect on the longevity and profitability of their business. We've looked at two events that have had worldwide impact on the stock market, namely Covid-19 and the Russia-Ukraine crisis. These are less common real-world events that have impacts on more than just the business one may be focusing on, but it provides a real picture as to how much stocks rely on stability in the events that occur in the real world other than just events in numbers.

To be more specific however, a company's stock value can be very greatly affected by "targeted" events such as a mishandling of public relations with profound impacts on the image of the company, or a growing awareness and concern on ethics in a specific industry (think child labour for some cosmetic or clothing industries).

3.1.1 Financial Statements

Company financial statements was one of the more influential quantitative aspects I focused on when selecting a company to trade stocks in. In terms of financial statements there are three very commonly used ones available: Cash Flow, Income Statement, and Balance Sheet. Among these three types of statements, the most viable seemed to be the Balance Sheet when looking at displaying the financial distribution and state of a company.

Balance sheets provide visual descriptions of a given company's assets, capital, equity distribution, and liabilities. These sheets can be viewed by annum or per quarter as required. This simulation focuses on the quarter balance sheets of any selected company as it reflects the most recent data available for the company. Balance sheets provide information on income and expenditure of a company over a given period of time, and almost always provides important pieces of information crucial to our final decision on whether the company is right for selection.

Figure 3.1 below shows the quarterly balance sheet for Tesla Inc., one of the companies selected for both the buy and hold simulation and swing trading simulation. This balance sheet contains 3 pieces of information that provide a better insight into the financial situation this company is in. First are the total assets the company has, which includes the monetary value of all the property and goods, as well as any debts owed by other parties. Second is the value of liabilities the company is responsible for such as debts, property, or goods that is owned by anyone other than the observed company itself. Last up is the equity, which more importantly to us is the shareholder's equity, explaining how much of the company is owned by shareholders of company stock.

Breakdown	3/31/2022	12/31/2021	9/30/2021	6/30/2021
∨ Total Assets	66,038,000	62,131,000	57,834,000	55,146,000
> Current Assets	29,050,000	27,100,000	25,002,000	24,693,000
> Total non-current assets	36,988,000	35,031,000	32,832,000	30,453,000
∨ Total Liabilities Net Minority Int...	30,632,000	30,548,000	29,340,000	28,896,000
> Current Liabilities	21,455,000	19,705,000	18,051,000	16,371,000
> Total Non Current Liabilities ...	9,177,000	10,843,000	11,289,000	12,525,000
∨ Total Equity Gross Minority Inte...	35,406,000	31,583,000	28,494,000	26,250,000
> Stockholders' Equity	34,085,000	30,189,000	27,053,000	24,804,000
Minority Interest	1,321,000	1,394,000	1,441,000	1,446,000
Total Capitalization	36,338,000	34,443,000	32,492,000	31,682,000
Common Stock Equity	34,085,000	30,189,000	27,053,000	24,804,000

Figure 3.1: Quarterly Balance Sheet for Tesla Inc. [27]

We will be using much of the information from company balance sheets as checkpoints when deciding on the stock we wish to invest in. For example, we must determine if the company is doing well financially, and to do that we look at how much money the company owes compared to how much it owns. One would assume that we would use a technique such as technical analysis to accomplish this task, however it is as important to observe the direction the company is heading in as it is to focus on just the numbers currently available to potential stockholders. For example, a company may currently have more debt than it does available assets due to a new expansion in company grounds for manufacturing. Looking at just the debt to asset ratios in this case would not be an entirely holistic way of analysing the company for a potential stock investment.

3.1.2 Financial Ratio Calculations

The debt to asset ratio briefly mentioned in the paragraph above is one way of determining the financial performance of a company selected for stocks. A lower ratio gives the indication that the company is doing well, whereas the opposite can usually but not always indicate that

performance is unsteady or that finances are risky. Other direct methods of measuring stock purchase plausibility are the price to earnings, profitability, and quick ratios respectively. The price to earnings ratio can be examined by using equation (1) above. Where the share price is the market share price of the company and the earnings per share represents the company's earnings for each individual share. This ratio is a quick and useful way in determining the company's worth and finding out whether they are over or undervalued.

There are many ways to examine a company's profitability ratio. For this paper we will not be focusing on the profitability ratio in order to come to a decision, but it is useful to understand that a higher profit margin is by some account a good indication of company value.

The quick ratio measures a company's ability to pay off or retire current liabilities with readily available assets on hand, and its equation is described below:

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventory}}{\text{Current Liabilities}} \quad (3)$$

Where current assets are all assets readily available with the exclusion of current inventory, and where current liabilities are all liabilities or debts the company currently owes that can be paid off.

3.2 Companies for Swing Trading Simulation

This section encompasses the various companies selected for the Swing Trading method. The name and description of each company will be accompanied by a brief explanation on why the stock for that company was chosen. Simulation data, such as the amount of money initially invested, will be provided in Chapter 4 later in the paper.

3.2.1 Apple Inc. (AAPL)

Apple Incorporated is an American manufacturer of personal computers, smartphones, tablet computers, computer peripherals, and computer software [28]. Founded on the 1st April 1976 in Los Altos, California, founders Steve Jobs and Steve Wozniak began creating an enterprise that would soon be a dominant player in the technological marketplace. Beginning as a hopeful personal computer manufacturing company, today's Apple has increased the services they provide and diversified itself to sell smartphones, tablets, watches, earphones, software, and even entertainment streaming.

Apple's revenue has seen a steady increase over the past 5 years: Based on information available on Marketwatch.com, Apple amassed a total of 365.82 billion USD in 2021, with gross income at 152.84 billion USD. This marks a 33.44% and 46.95% growth in both revenue and income respectively, far outshining even the pre-Covid growths in 2018 of 16.29% and 17.40%.

Although AAPL stock has seen a decrease in price over the past 6 months of 24.93 USD per share, their stock as an already well-established company remains relatively stable. Additionally, since May 25th, 2022, Apple's stock has begun what appears to be an upward trend, having increased to 151.21 USD from 140.52 USD in just the past week alone. Apple's MACD Chart is shown in Figure 3.2.1 below.



Figure 3.2.1: Apple Inc. MACD Chart via Marketwatch.com

Apple Inc's yearlong MACD chart allows us to observe any opportunities for potential profit. As Figure 3.1.2 above shows us, the Exponential Moving Average (EMA) for Apple stock over a 50-day period was 155.05, decreasing from the month prior but with observations that suggest an increase in stock value over the next 50-day period. This potential opportunity to make a profit could not go unseen, and as a result places Apple Inc. as one of our companies for the Swing Trading simulation method.

3.2.2 Church & Dwight Co., Inc. (CHD)

Church and Dwight Co., Inc. is a major American manufacturer of household products. Their most well-known product line is Arm & Hammer which consists of the baking soda as well as some other common household products such as laundry soap. Founded in 1847 as an effort to unify competing companies formed by John Dwight and Austin Church, the company's original product was that of baking soda [29]. Over time, Church & Dwight Co., Inc. have evolved to acquire companies such as Oxi-Clean and Trojan.

Church & Dwight's revenue over the past 4 years has remained consistent. Information available on Marketwatch.com regarding Church & Dwight's income statement reflects roughly

an average of an 8% increase between years 2018-2021. In addition to their steady revenue, Figure 3.2.2 below shows that Church & Dwight's recent price to earnings ratio has begun a downward trend to what is now 27.32, from what seemed to be an unchanging 30.26 just weeks before. This signals to potential investors that the current risk to invest is low.

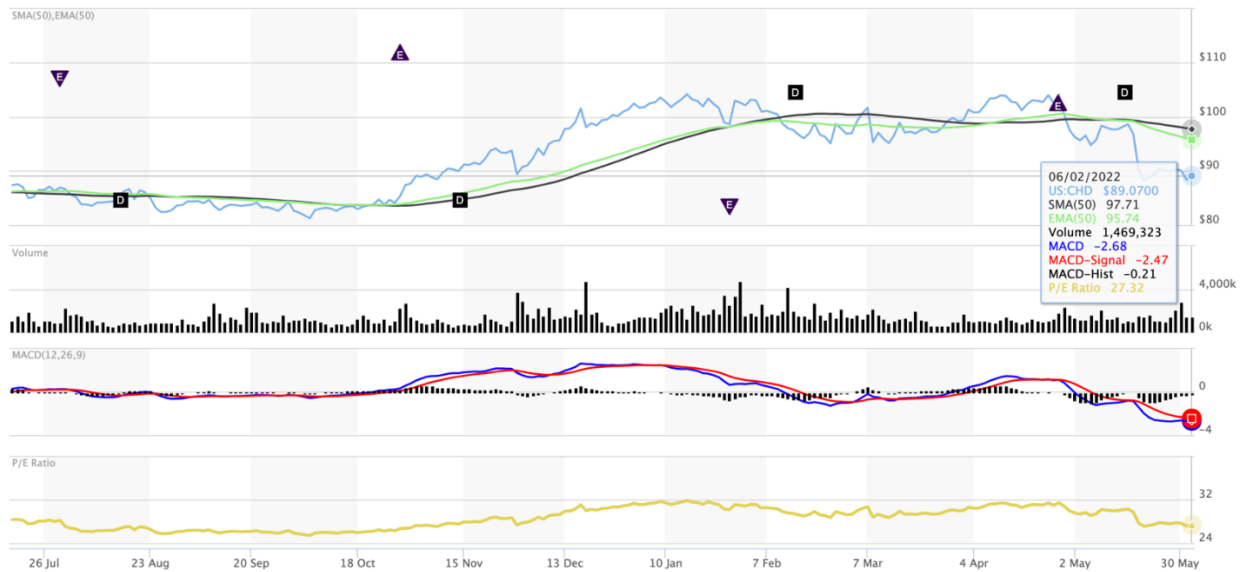


Figure 3.2.2: Church & Dwight Co., Inc. MACD Chart via Marketwatch.com

Alongside steady numbers in Revenue, Church and Dwight have maintained a positive number in gross income growth, with an average of 6.5% over the past 4 years [30]. Although income growth stalled in 2021 to just 1.37%, the overall trend remains to be on a positive track.

As Church and Dwight are subsidiary owners of numerous health & well-being enterprises, in consideration with the recent Supreme Court hearings of Roe vs. Wade, the revenue sitting at 5.19 billion USD and gross income at 2.14 billion USD in just 2021 alone, and with the apparent decrease in investment risk, I decided to include Church & Dwight Co., Inc. as one of the companies I would have on my Swing Trading Simulation portfolio.

3.2.3 Tesla, Inc. (TSLA)

Tesla Inc. is a multinational automotive and clean energy company. The company began by both designing and manufacturing electric vehicles [31]. Founded in 2003 by Elon Musk and his group of engineers, Tesla states that they set forth on a mission to prove that electric cars can be both as viable and as entertaining as petroleum powered cars. Since the launch of the original Tesla Roadster in 2008, Tesla has diversified its profile to include 4 different models of vehicles in both the sedan and SUV categories, with plans for production of more vehicles in categories such as pick-ups and semi-trucking.

In terms of finances, Tesla's revenue shows both incredible performance and tremendous potential for annual average revenue, annual revenue growth, and the 5-year revenue trend. Figures 3.2.3.1 and 3.2.3.2 below from Marketwatch.com show us both the history of revenue and income over the past 5 years from 2017 until 2021.

ITEM	2017	2018	2019	2020	2021	5-YEAR TREND
Sales/Revenue	11.76B	21.46B	24.58B	31.54B	53.82B	
Sales Growth	-	82.51%	14.52%	28.31%	70.67%	

Figure 3.2.3.1: Tesla 5-Year Income Statement for Revenue via Marketwatch.com

Gross Income	2.22B	4.04B	4.07B	6.63B	13.61B	
Gross Income Growth	-	82.33%	0.67%	62.94%	105.22%	
Gross Profit Margin	-	-	-	-	25.28%	

Figure 3.2.3.2: Tesla 5-Year Income Statement for Gross Income via Marketwatch.com

As is evident from Figures 3.2.3.1 and 3.2.3.2 above, Tesla has seen an average of 28.63 billion USD in revenue over the past 5 years, with an observable increase in revenue in 2018 and 2021 compared to the previous years respectively. This increase in revenue is largely thanks to

both Tesla's production of new car models (for 2018), and a ramp up of production speed (observed in 2021).

Continuing the focus to Tesla stock's current and historical data, we observe from Figure 3.2.3.3 that Tesla's price to earnings ratio has seen a gradual decrease over the course of the past few quarters.

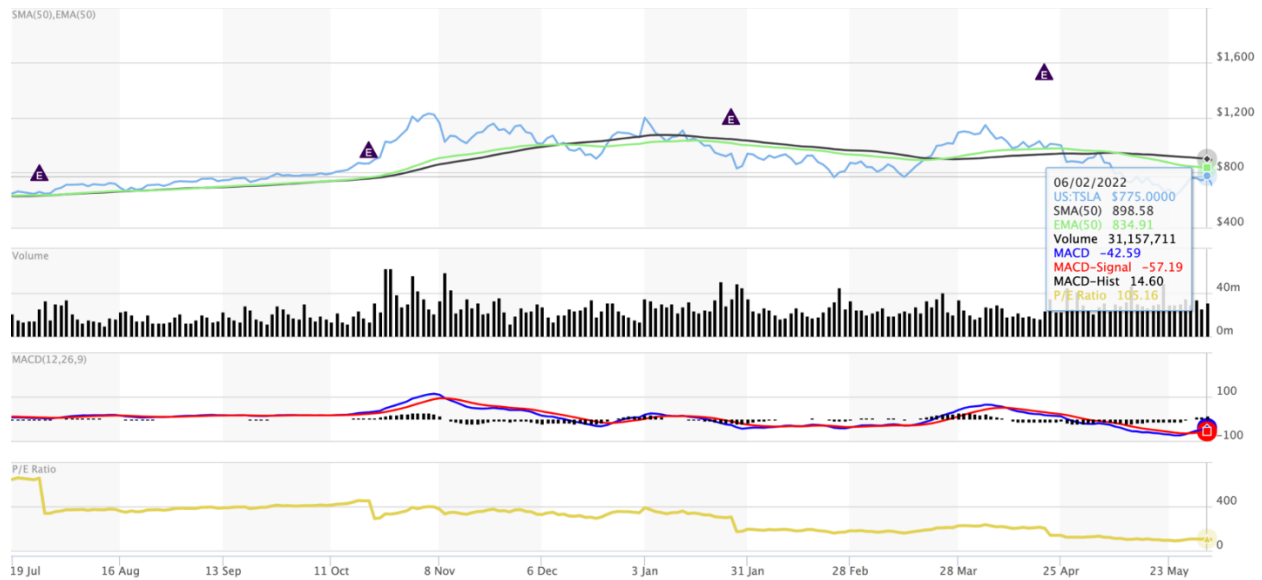


Figure 3.2.3.3: Tesla, Inc. MACD Chart via Marketwatch.com

This gradual decrease in the price to earnings ratio not only allows us to understand that there is a decrease in investment risk, but also informs of the idea that if one were to buy in at this moment, it would be more of a longer waiting game than the other two stocks for this Swing Trading Simulation. On top of the price to earnings ratio, the EMA trend for Tesla's stock price also bears an uncanny resemblance to that of Church & Dwight Co., Inc's visible trend. This may possibly be due to recent supply shortages and tariffs imposed by the U.S. government, resulting in industries suffering across the board. Regardless, the EMA shows us that there is going to either be an upward or stable trend on stock price in the coming months, and that in addition to knowledge

that Tesla will split their stocks sometime in July is the reason why Tesla Inc. was selected for both the Swing Trading Simulation and Buy and Hold Trading Simulation.

3.3 Companies for Buy and Hold Trading Simulation

This section encompasses the various companies selected for the Buy and Hold Simulation method. The name and description of each company will be accompanied by a brief explanation on why the stock for that company was chosen. Much like Section 3.2 on the companies selected for Swing Trading, simulation data such as the amount of money initially invested, will be provided in Chapter 4 later in the paper.

3.3.1 S&P Global Inc. (SPGI)

Standard & Poor's Global Inc. is an American corporation with a primary area of focus on financial information and analytics. More specifically, S&P Global Inc. provides the global markets with credit ratings, benchmarks, and analytics. Tasks largely revolving the market are split between divisions in the company itself, with said divisions being separated by Market Intelligence, Ratings, Commodity Insights, Mobility, Indices, and Engineering Solutions. Each division focuses on different services and industries within the stock market, providing a more tailored estimate to each sector itself.

S&P Global Inc. has maintained a steady stream of revenue since 2017, with total figures coming out between 6-8 billion USD per annum over the course of the past 5 years. Company revenue growth has also seen steady numbers over the past half decade, with an average recorded revenue increase at around 8% between 2018-2021 [32]. Figures 3.3.1.1 and 3.3.1.2 below show us both the Sales Revenue and Gross Income over the past 5 years.

ITEM	2017	2018	2019	2020	2021	5-YEAR TREND
Sales/Revenue	6.06B	6.26B	6.7B	7.44B	8.3B	
Sales Growth	-	3.22%	7.05%	11.09%	11.49%	

Figure 3.3.1.1: S&P Global Inc. Income Statement for Revenue via Marketwatch.com

Gross Income	4.17B	4.35B	4.69B	5.14B	5.92B	
Gross Income Growth	-	4.41%	7.81%	9.59%	15.16%	
Gross Profit Margin	-	-	-	-	71.40%	

Figure 3.3.1.2: S&P Global Inc. Income Statement for Gross Income via Marketwatch.com

Figure 3.3.1.1 visualises the revenue income statement history for S&P Global Inc. over the past 5 years from 2017 to 2021. A continuous growth trend can be seen, with sales growth increasing by over 10% in 2020 and 2021. Similarly, Figure 3.3.1.2 represents S&P Global Inc.'s gross income, where it is visible that a similar trend in growth is formed from the gradual increase in gross income. We can additionally observe from Figure 3.3.1.3 below that S&P Global Inc. has achieved this parallel in terms of Revenue and Gross Income growth, specifically in 2021, by maintaining a somewhat stable expense on cost.

Cost of Goods Sold (COGS) incl. D&A	1.89B	1.9B	2.01B	2.3B	2.37B	
COGS Growth	-	0.58%	5.30%	14.61%	3.26%	
COGS excluding D&A	1.71B	1.7B	1.8B	2.09B	2.2B	

Figure 3.3.1.3: S&P Global Inc. Income Statement for Cost of Goods Sold via Marketwatch.com

S&P Global Inc. has seen a steep decline in stock value over the past few months. This could likely be a result of the tariffs set in place by the U.S. government leading up to the events in Ukraine, and as a result induced stockholders to diversify or solidify their portfolios. This is one of the more plausible explanations, as sales has not only remained at the same level but increased.

Figure 3.3.1.4 provides an idea on when stock prices for S&P Global Inc. began to drop. Early January seems to be when S&P Global Inc. stocks began a downward trend in stock value,

which coincidentally is around the time tensions between Russia and Ukraine were observed at relative highs. In addition to tariffs imposed on Russian exports, previous tariffs set in place on Chinese exports by former U.S. President Donald Trump were further enforced, impacting the stock market. Figure 3.3.1.4 also shows us the trend on the price to earnings ratio, in addition to the exponential moving average. While the price to earnings ratio indicates less risk in investment at this current time, the exponential moving average seems to indicate a downward trend on the stock value. This downward trend on stock value is precisely the reason S&P Global Inc. was selected as part of the Buy and Hold trading method, as I plan to buy in low and hold to sell when prices rise.



Figure 3.3.1.4: S&P Global Inc. MACD Chart via Marketwatch.com

3.3.2 BYD Co. Ltd. (BYDDY)

BYD Company Limited is a Chinese company with roots in the manufacturing and production of batteries. Founded in 1995, BYD has since expanded its operations to include itself as a prominent player in both the automobile and electronics industry. With strong capabilities in

battery production, BYD has developed many electric and plug-in hybrid vehicles, specifically targeting the more economically considerate electric and hybrid vehicle markets. BYD has also diversified into the contracted assembly of cell phones for third party companies, in addition to that of solar cells.

BYD Co. Ltd. has seen fluctuation in revenue over the past 5 years. According to Marketwatch.com, revenue for BYD had even been reported as having gone into the red for their 2019 income statement. Revenue did increase in by nearly 50% however in 2021, except this increase in revenue was accompanied by a tremendous increase in cost too. Their gross income has therefore remained somewhat stagnant, with figures remaining at around the same average as it had 5 years ago. Figures 3.3.2.1 and 3.3.2.2 show these figures in detail, with Figure 3.3.2.2 visualising the stagnancy in gross income as a series of up and down numbers.

Sales/Revenue	118.37B	144.26B	138.09B	172.45B	254.66B	
Sales Growth	-	21.87%	-4.28%	24.89%	47.67%	
Cost of Goods Sold (COGS) incl. D&A	97.51B	122.72B	117.73B	145.11B	229.51B	
COGS Growth	-	25.85%	-4.06%	23.26%	58.15%	
COGS excluding D&A	89.48B	111.72B	106.57B	131.05B	212.5B	

Figure 3.3.2.1: BYD Co. Ltd. Income Statement for Revenue and Cost via Marketwatch.com

Gross Income	20.86B	21.54B	20.36B	27.34B	25.16B	
Gross Income Growth	-	3.27%	-5.49%	34.29%	-7.98%	
Gross Profit Margin	-	-	-	-	9.88%	

Figure 3.3.2.2: BYD Co. Ltd. Income Statement for Gross Income via Marketwatch.com

Although BYD's income statement paints a rather risky picture for potential investment, the reason BYD Company Limited was considered to be included in the Buy and Hold trading portfolio is because of their performance in the stock market. BYDDY stock at the time of this composition was on very visible uphill climb. With regard to Figure 3.3.2.3 below, and using

knowledge gathered from researching the idea that stock market trends repeat themselves, I am fairly confident that the current upward trend of the exponential moving average will in fact increase to at least the level it was at between Nov 22nd and Dec 20th. This educated presumption in the increase in stock value is the reason why BYD Company Limited was selected to be included in this portfolio.

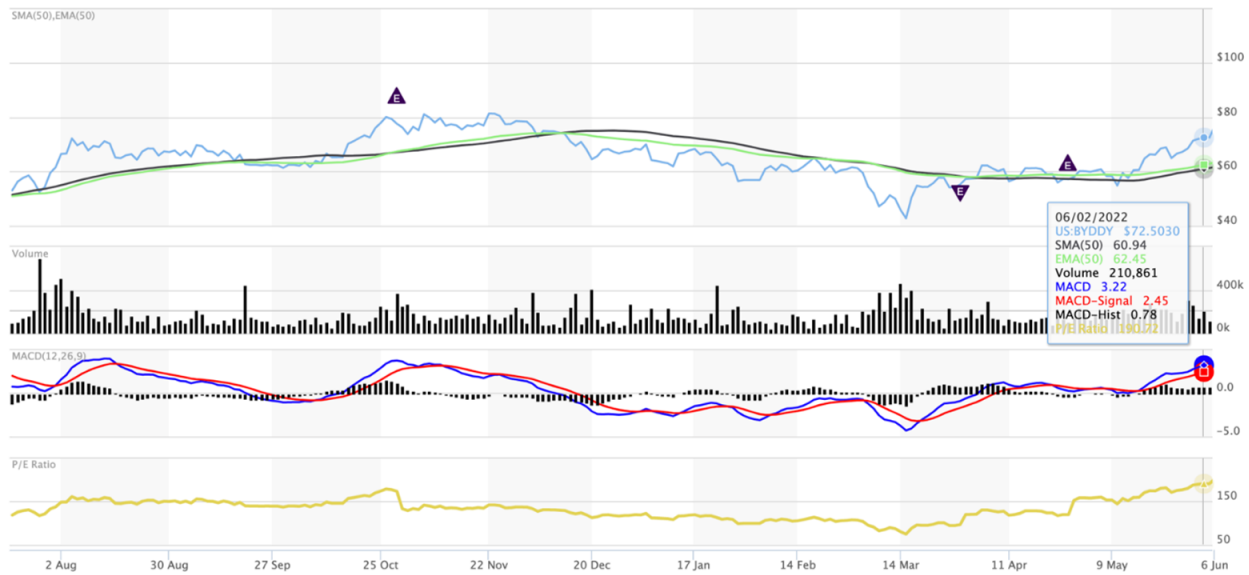


Figure 3.3.2.3: BYD Co. Ltd. MACD Chart via Marketwatch.com

3.3.3 Tesla, Inc. (TSLA)

It is not an error that Tesla is included in both the Swing Trading simulation portfolio, and this Buy and Hold simulation portfolio. On top of being an undeniably rapid growing corporation, Tesla’s stock itself has also had a very volatile history. I wanted to select Tesla stock for both the Swing Trading simulation and Buy and Hold Trading simulation portfolios because of its vastly interesting performance. There are a variety of real-world factors that influence Tesla’s performance on the stock market. Situations such as computing chip shortages, the international tariffs set in place by the U.S. government, the Coronavirus, an increase in petrol prices, and even

more personal events relating to the CEO Elon Musk all have either a positive or negative effect on Tesla's stock price during the time the event takes place. This interest in the volatility and ease of change in Tesla's stock price is the reason why it would be ideal to be able to compare two different trading methods to determine which form of trading would suffice against abrupt change.

4. Swing Trading Simulation

This chapter will explain in detail the Swing Trading simulation data, which includes the amounts of initial investment, the analysis of the trends pertaining to the stock itself, and results of overall investment according to the simulation method utilised.

By now it is needless to say that the initial capital along with the data gathered will exist purely inside a simulation. Delving into the stock market without a clear idea of what one is doing is definitely a risky endeavour, and despite using a simulation platform with capital that is essentially make-believe, as an individual with little to no prior stock market investment experience it was initially quite a challenge to decide upon both the companies I would select and the simulation platform I would use. While there are plenty of stock simulation platforms out there, after doing some of my own research I decided to use the simulation platform *Investopedia simulator*.

The data gathered during this project will consist of figures retrieved purely from the Investopedia simulator itself. Investopedia is a great platform to use because the stocks that exist follow the exact same stock trends as the stock market itself. Additionally, the platform also simulates the buying and selling of stocks with real-time delays when purchasing or selling. The initial capital available for the Simulation is 100,000 USD where \$50,000 of that is made available to the Swing Trading method.

4.1 The Simulation

The initial investment put forth on the three companies selected for the Swing Trading simulation was roughly \$31,000 in total. The reason for this number in specific is because I wanted to diversify the amount invested across the three companies, invest an amount that would most

likely see some profit over the course of an uptrend, and also leave enough money for additional injections to a specific company’s stock if it seemed to be performing better than that of the others. Investments were split according to the perceived stock trend at the time of investment, in addition to the financial records for that specific company. Table 4.1 below explains in detail how much capital was invested into each company.

Table 4.1: Initial investment amounts in AAPL, CHD, and TSL

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
							\$50,000.00	
06/03/22	AAPL	Buy	\$146.40	80	\$11,712.00	\$0	\$38,288.00	\$0
06/03/22	CHD	Buy	\$88.30	95	\$8,388.50	\$0	\$29,899.50	\$0
06/03/22	TSLA	Buy	\$718.47	15	\$10,777.05	\$0	\$19,122.45	\$0

4.1.1 Week One (5th – 10th Jun)

During the course of the first week, the total investment portfolio for Apple Inc., Church & Dwight Co., Inc., and Tesla Inc. dipped by \$962.95. Our overall loss for Apple’s shares dropped by \$489.60, Tesla’s by \$195.00, and Church & Dwight by \$278.35 when calculated at opening.

Figure 4.1.1.1 below shows us the weeklong trend for AAPL stock. After the initial investment, it is observed that stocks had an uptrend to a high point of \$148.71 at the end of the day for June 7th. A downtrend is then observed beginning after closing on June 8th to a low point of \$137.13.

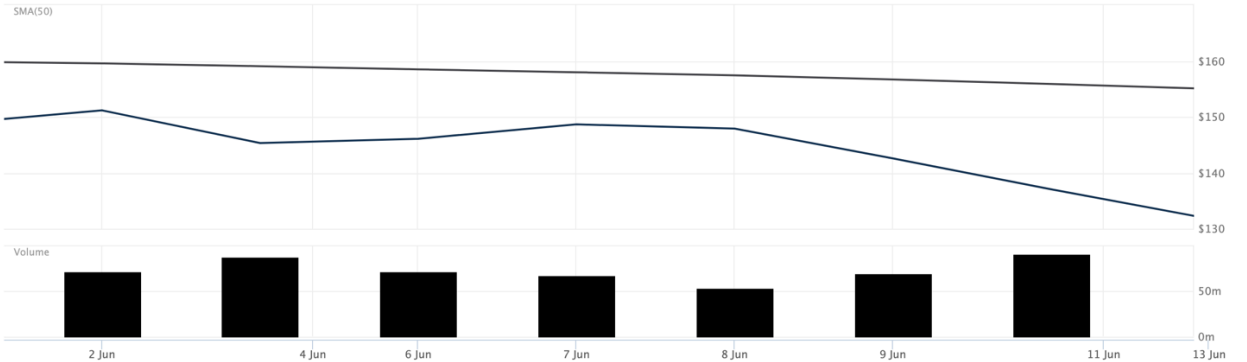


Figure 4.1.1.1: AAPL Stock Trend June 3rd to June 10th via WSJ.com

This drop in Apple's individual stock price represents a 5.67% decrease from the initial investment stock price. As this percentage is somewhat significant for such a short period of time, I decided to perform an analysis on Apple's previous stock trend history to determine if I should sell or hold the amount I had. The analysis revealed that Apple had indeed at one point have a period back in March of 2022 where there was a similar downtrend but that after a while it slowly turned and became an uptrend. With the belief that this would prove to be a similar scenario, I decided to hold on to my Apple stocks for the time being.

Tesla's weeklong trend on the other hand was relatively stable. Quite surprisingly, for a stock as volatile as Tesla's, there were no superfluous movements in the share price with room only for small and gradual increments or decrements. Figure 4.1.1.2 visualises the steady movements observed over the week of June 3rd to June 10th, with the high point sitting at \$725.60 for June 8th, and the low point at \$696.69 on June 10th.

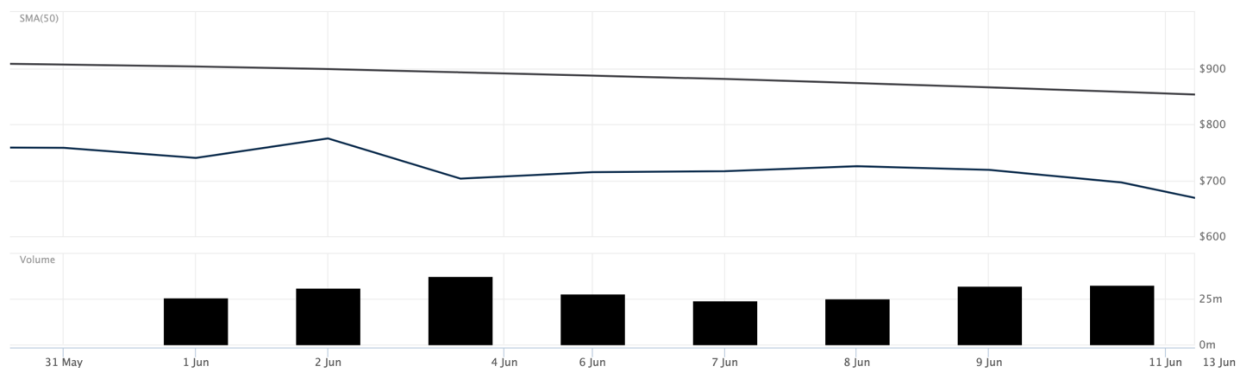


Figure 4.1.1.2: TSLA Stock Trend June 3rd to June 10th via WSJ.com

The overall decrease in Tesla stock from the initial buy in price to the low point on June 10th represented over a 3.12% loss for each individual share. After observing the current downtrend for Tesla stock, I decided to see if buying more shares in Tesla stock would be a viable option. Under normal fluctuating circumstances, I would have calculated the risk to reward ratio in terms of an unknown variable X to help aid me in my decision. However, the price of each share continued to fall throughout the following days up until the 13th of June. Keeping in mind that the lowest price Tesla stock has been over the course of the past month was \$628.16 per share on the 24th of May, and that there were no obvious signs of disaster in terms of news for Tesla Inc., I set in for a buy in price of \$655.00 with 10 shares.

After reviewing Church & Dwight Co., Inc's stock trend over this past week. There seems to be a slight downtrend occurring for all three stocks on this portfolio. Although Church & Dwight retained its share price to a certain degree, they still ended the week on an individual share price loss of around 3.3%.

Figure 4.1.1.3 shows that the highest point in stock price during this week was actually on the same day as our buy-in, June 3rd, sitting at \$88.74 on closing. The individual share price then continued to slope downward thereafter to the lowest point of \$85.90 on the 10th of June. Shares for Church & Dwight seemed to continue to fall, however dissimilar to Tesla stock, I noticed that not only are Church & Dwight stocks worth less per individual share, but that an analysis of previous share history revealed they do not share the same volatile properties as Tesla stock. Their income statements are also a testament to their gradual change in stock price, as there is not much room for movement. Therefore, it did not seem viable to buy-in on Church & Dwight Co., Inc. stock at this current moment in time. In addition to the belief that their stock prices would go up at a future point, I held on to my CHD shares.

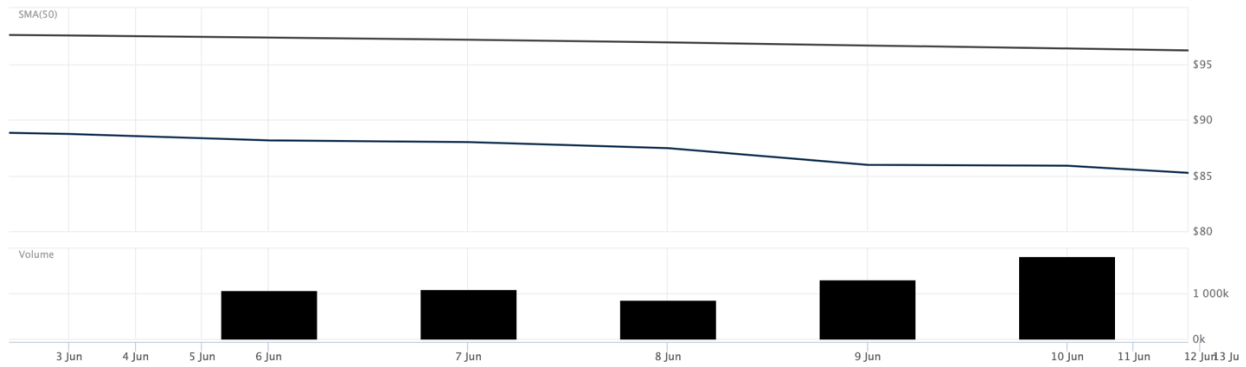


Figure 4.1.1.3: CHD Stock Trend June 3rd to June 10th via WSJ.com

To summarise, at the end of week one I decided to hold on to existing shares in both Apple Inc. and Church & Dwight Co., Inc. while going through with an additional purchase in Tesla stocks for 10 shares at a buy-in price of \$655.00. Table 4.1.1 below summarises the transactions made in week one.

Table 4.1.1: End of Week One Transactions using Swing Trading

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
06/10/22	TSLA	Buy	\$655.00	10	\$6,550.00	\$0	\$12,572.45	\$0

4.1.2 Week Two (11th – 17th Jun)

After suffering some loss of capital during the first week, much of the loss from the second week due to the downtrend began to stabilise and begin what appeared to be an uptrend. Even so, the investment portfolio for Apple Inc., Church & Dwight Co., Inc., and Tesla Inc. still suffered a loss of \$1,880.45 this week, which includes a \$47.20 loss from the second round of TSLA shares bought at the end of week one. This figure then represents a total loss of \$2,843.40 down from the initial investments made in the initial buy-ins prior to the first week. All companies in the portfolio decreased in individual share value, and in terms of percentage decreases per individual company compared to the previous week: AAPL portfolio stock decreased by just over 6.21% - corresponding to a monetary loss of \$827.85, TSLA portfolio stock decreased by just over 7.82%

and 0.72% - corresponding to a monetary loss of \$697.60 and \$47.20 respectively, and CHD portfolio stock decreased close to 3.80% - corresponding to a monetary loss of \$307.80.

Although there was an evident decrease in all three stocks again this week, I am not stirred in my confidence that the market will rebound and begin another uptrend soon. This stability in confidence comes from the fact that the S&P 500 index also decreased by around 6.13% during this time, which tells me that there is no need to worry about any of the individual companies in my portfolio, as the industries in this section of the market are currently going through a rut.

Apple Inc. stocks during week two of the simulation saw a wave of uptrend and downtrend fluctuations. The highest point for Apple share prices saw itself at a \$135.43 at closing time on the 15th June, whereas the low point for Apple share prices dropped to a meagre \$130.06 at closing time on 16th June. After observing the stock trend during the week of June 11th to June 17th, I thought about the potential of buying in more stocks at a price of \$132.00. I used the equation of a risk to reward ratio to calculate the conceivability of an additional influx in stocks. The equation for said ratio can be observed below:

$$\frac{\$132.00 - \$130.06}{\$135.43 - \$132.00} = 0.566 \quad (4)$$

This ratio of 0.566 indicates to us that the current risk to invest at the price of \$132.00 or below is significantly low enough that an investment during this current stage carries greater potential profit than it does risk. With this finding in hand, I made the decision to buy more shares in Apple stock, details of which will be provided in Table 4.1.2 near the end of this section. Figure 4.1.2.1 below provides us with the stock trend on the week of Jun 11th to Jun 17th, as is described above we see a slight oscillation between uptrends and downtrends this week.

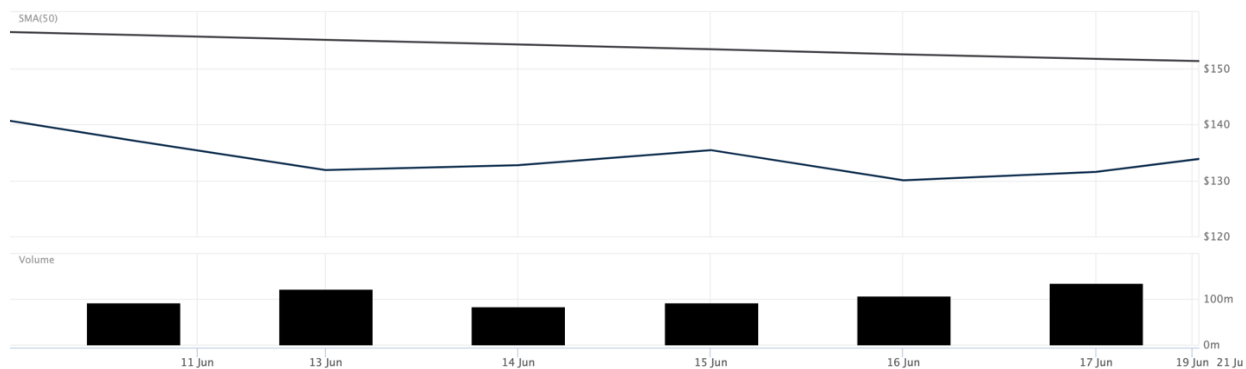


Figure 4.1.2.1: AAPL Stock Trend June 11th to June 17th via WSJ.com

Tesla saw an uncannily similar stock trend this week, with uptrends and downtrends forming on the same dates as those of Apple Inc.'s trends as seen in Figure 4.1.2.2 below.

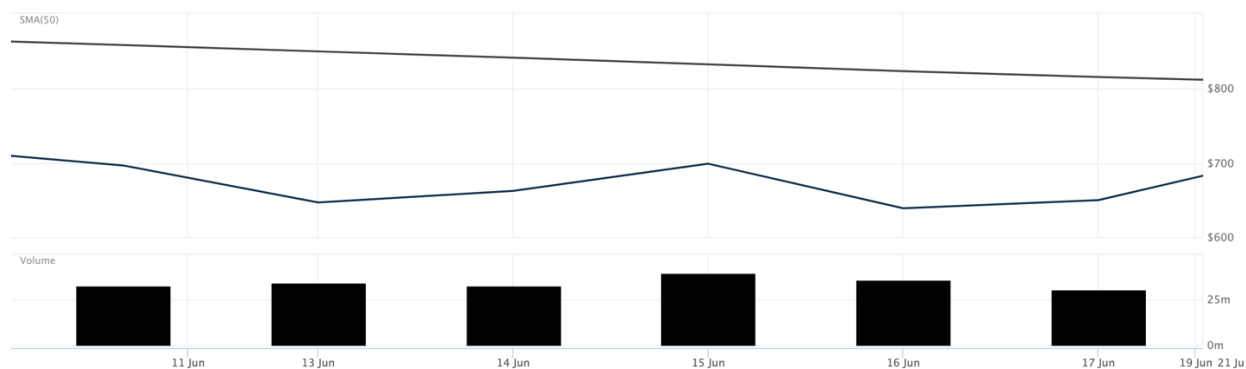


Figure 4.1.2.2: TSLA Stock Trend June 11th to June 17th via WSJ.com

Tesla saw a closing time high point in share value at \$699.00 for the 15th June, and \$639.30 as the closing time low point the following day on the 16th June. Because the stock trend for both AAPL and TSLA were extremely similar, I viewed this as an indication that a buy in on TSLA stock at a price of \$687.00 would also carry higher greater profit potential than that of potential risk. Using the risk to reward ratio below, we can conclude however that the calculated ratio of 3.975 is much higher than that of 1, making the buy in at a price of \$687.00 extremely risky. With this information in mind, I decided to hold on to the Tesla stock I had on hand.

$$\frac{\$687.00 - \$639.30}{\$699.00 - \$687.00} = 0.566 \quad (5)$$

Church & Dwight Co., Inc. saw a much more steady decrease in stock value this week. The highest point of CHD individual share value this week was \$84.85 at closing on the 13th June, and \$81.50 on 15th June at closing. Due to the gradually sloping downtrend in CHD stock in addition to the undeniably pending uptrend in the coming days, there was a consideration to purchase more Church & Dwight Co., Inc. stock. However, I did not feel confident enough in their financial portfolio to invest more than the original amount in the company. Additionally, the risk to reward ratio to invest in CHD stock towards the end of this week was already too high for a safe consideration. Therefore, I decided to hold on to my stock in CHD again this week. Figure 4.1.2.3 provides a visualisation on the stock trend for Church & Dwight Co., Inc.

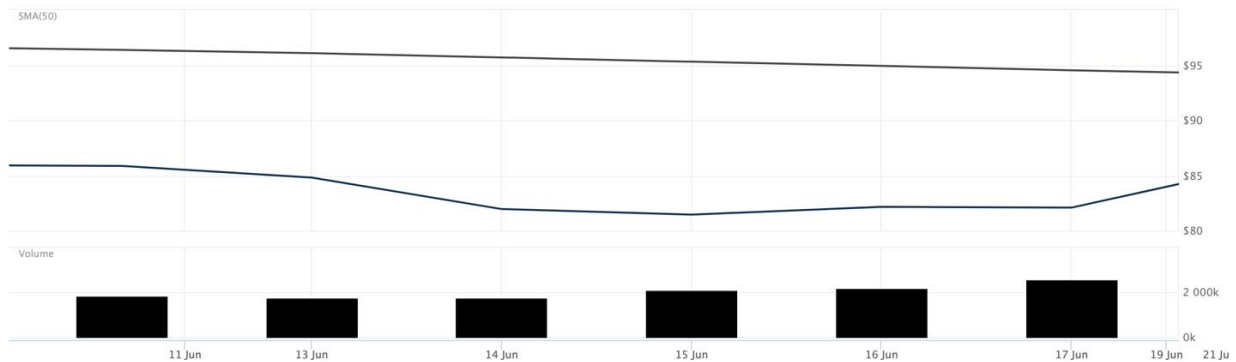


Figure 4.1.2.3: CHD Stock Trend June 11th to June 17th via WSJ.com

Table 4.1.2 below shows a summary of the transactions made in week two. I bought another 20 shares in AAPL and held on to my existing TSLA and CHD stocks.

Table 4.1.2: End of Week Two Transactions using Swing Trading

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
06/17/22	AAPL	Buy	\$132.00	20	\$2,640.00	\$0	\$9,932.45	\$0

4.1.3 Week Three (18th – 24th Jun)

Week three saw a drastic positive change in both individual share prices and total investment profit. Although the market closed for 3 days in observance of Juneteenth, the market segment for each of the three companies in this portfolio saw an increase in individual share worth towards the end of the week. The corresponding increase in the S&P 500 index supports this rise and represents an overall uptrend in this section of the market. Since I had previously anticipated an uptrend in stock value for at least 2 of the 3 companies in the Swing Trading portfolio, my intended approach to tackle this week’s stock performance was to attempt the selling of a portion of stocks bought from previous weeks at a potentially higher price. The goal was to both attempt to cash in on the uptrend as high as possible while also recouping losses from Weeks One and Two. Table 4.1.3 at the end of this week’s update lists the transactions that occurred for each of the individual stocks in the Swing Trading portfolio in Week Three. Note that a new column for “Assets” was provided due to the inclusion of stock sales this week and helps to visualise the total portfolio worth after all transactions.

Apple Inc. saw an increase per stock of just over \$10.00 this past week, representing close to an 8% increase in individual share value on the 24th June since the 17th. The lowest individual share price for Apple Inc. remained at \$131.56 on closing since the 17th up until the 21st, due to Juneteenth, and observed a high of \$141.66 at closing on the 24th. Although the Relative Strength Index (RSI) for Apple stocks did not represent a high enough number to account for an overbought trend, following my goal this week to cash in on the uptrend, I sold the 20 shares I bought for

Apple Inc. the week before at a price of \$132.00 for \$135.14 near closing on the 22nd June. Keeping in mind that the RSI did not indicate enough of a risk in current Apple stock prices, I decided not to sell the stock bought towards the start of the simulation and made the decision to hold on in the hopes that it would continue to increase in price and reach a profitable selling point. The sale of 20 shares at \$135.14 per share then corresponded to a \$62.80 profit compared to the buy in from Week two. Figure 4.1.3.1 below visualises the stock value of Apple Inc. throughout Week Three between 18th - 24th June.

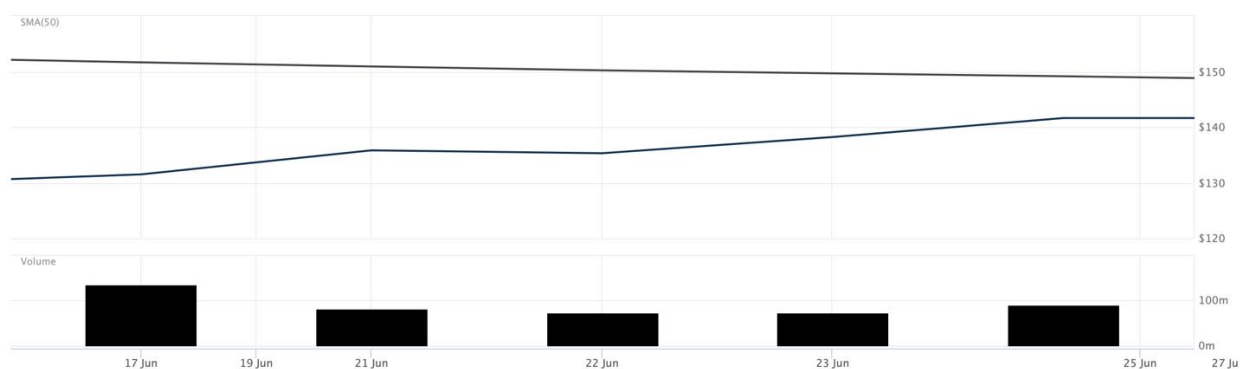


Figure 4.1.3.1: AAPL Stock Trend June 18th to June 24th via WSJ.com

On top of the increase in stock performance for Apple Inc., Tesla Inc. saw drastic changes in stock value between the period of the 18th to 24th June. When the market reopened this week on the 21st, Tesla saw an immediate increase of \$60.83 via closing time differences of \$650.28 and \$711.11 on the 17th and 21st June respectively. This represents more than a 9% increase in individual share price. Observable in Figure 4.1.3.2, Tesla's RSI increased by almost 25% from 39.92 to 48.16 as a result of this sudden increase in individual stock price. Initially I was very much inclined to sell the majority of my stake in Tesla stock towards the beginning of this week, however, before rushing to any decisions and upon observing Tesla Inc. stock's previous market trends for when sudden uptrends like this have occurred, I noticed that between 24th May and 27th

May of 2022, Tesla observed continual growth in individual share price from \$628.16 to \$759.63 over the period of these three days.

After this growth period, the stock then flattened out before beginning a downtrend. In light of this observance, I made the decision to wait until the last possible trading day of this week to sell half my shares in Tesla Inc. As a result, a sale of 15 shares split into 5 shares from the initial investment and 10 shares from the investment in Week One was conducted on the 24th June in light of the continued growth from Tesla Inc. All 15 shares were listed to be sold at a limit order price of \$720.00 after noting that the market price had reached up to over \$735.00. The shares were shortly after sold for \$730.47, resembling a \$754.70 profit from the 10 shares bought in Week One and exactly \$60.00 in profit from 5 shares bought during the initial investment phase. Tesla's stock trend as well as the aforementioned RSI increase for the period of June 18th to 24th can be seen below in Figure 4.1.3.2, showing closing time values at \$650.28 for the low point of this week and \$737.12 as the high point.

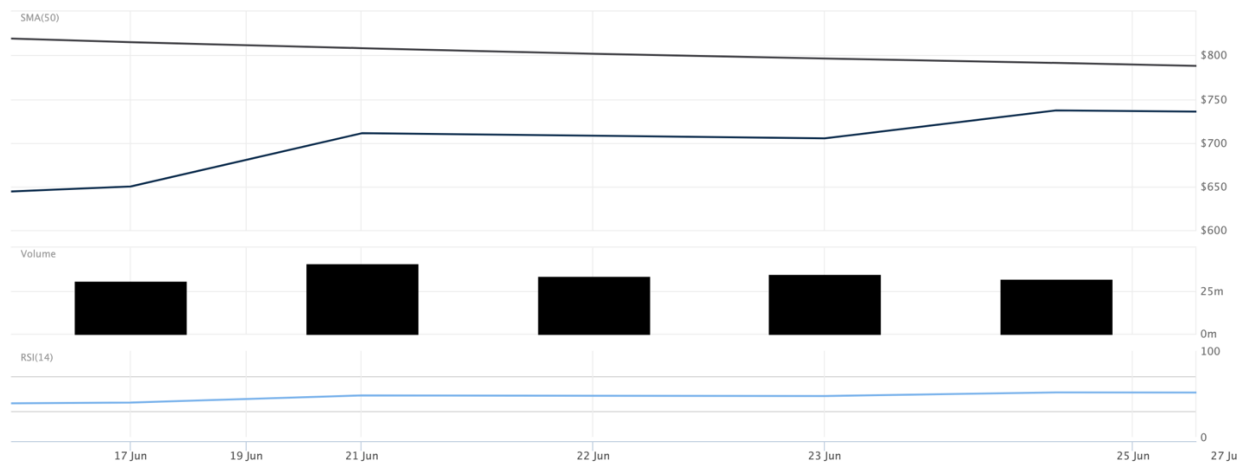


Figure 4.1.3.2: TSLA Stock Trend June 18th to June 24th via WSJ.com

Similar to Apple Inc., Church & Dwight Co., Inc. observed a more gradual increase in stock value this past week, going from a low point of \$82.13 on closing from the 17th the week before to \$91.61 at closing on the 24th June. After the market reopened post-observance of

Juneteenth, CHD shares increased by \$3.78 per individual share to \$85.91 at closing on the 21st June, representing over a 4.6% increase since the closing price of \$82.13 the previous week. An increase of this proportion had not been seen since late April to early May, which then resulted in a plateau, leading me to more of an inclination on holding the existing shares I had and further observing the trend in Church & Dwight stock trends rather than selling my existing shares. Additionally, the risk in Church & Dwight shares dropping to portfolio-devastating prices was exceptionally low compared to that of Apple and Tesla, since Church & Dwight are not in the same volatile market segment as the prior two and have also been a long-since established corporation with relatively stable share values. After much contemplation, I made the decision to hold on to the shares I had for Church & Dwight Co., Inc. Figure 4.1.3.3 below shows the stock trend for Church & Dwight Co., Inc., visualising the gradual share price growth experienced this week.

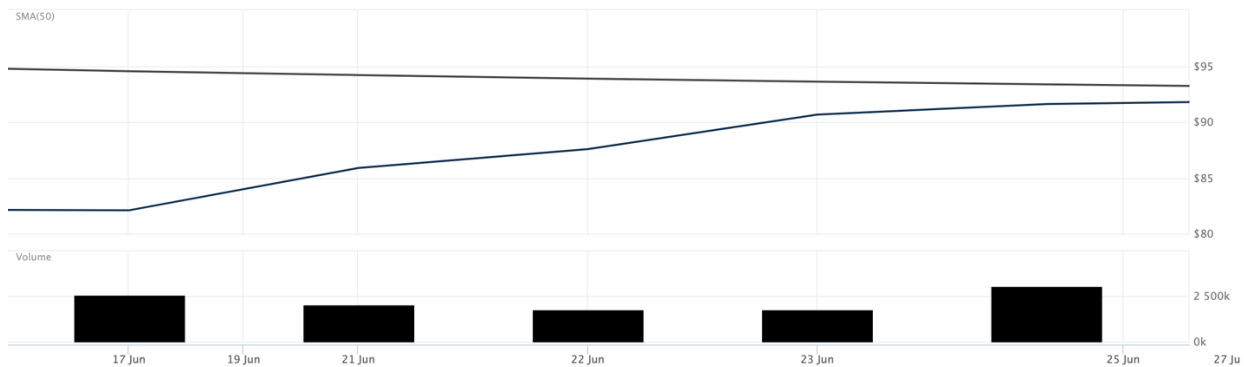


Figure 4.1.3.3: CHD Stock Trend June 18th to June 24th via WSJ.com

During the course of this week, I observed uptrends from all three companies in the Swing Trading simulation portfolio. Decisions were made that resulted in the sale of a portion of Tesla and Apple Inc. stocks in order to cash in on the share value increase and make up for losses observed throughout Weeks One and Two. The most notable sale made this week is indubitably that of Tesla Inc.'s, with a profit of \$814.70 conducted through a split sale of 15 total shares. Apple

shares were also sold resulting in a slightly less impressive but equally significant profit of \$62.80. Table 4.1.3 below details the transactions conducted, and reflects an overall increase of \$999.25 in portfolio value since the beginning of the simulation.

Table 4.1.3: End of Week Three Transactions using Swing Trading

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
06/22/22	AAPL	Sell	\$135.14	20	\$2,702.80	\$62.80	\$12,635.25	\$62.80
06/24/22	TSLA	Sell	\$730.47	5	\$7,304.70	\$60.00	\$19,939.95	\$122.80
06/24/22	TSLA	Sell	\$730.47	10	\$3,652.35	\$754.70	\$23,592.30	\$877.50

4.1.4 Week Four (25th Jun – 1st Jul)

The stock market this week saw varying fluctuations between all three companies involved in the portfolio. The S&P 500 reflected a downtrend towards the start of the week for a majority of the week until a small increase was observed between the 30th June and 1st July. Similarly, Apple and Tesla Inc. both observed decreases in share value up until the 30th June as compared to the previous week, with Apple seeing an additional countertrend between 28th June to 30th June. Due to the difference in market segment, Church and Dwight Co., Inc. observed further increases in share price following a minor dip in closing share price on the 28th.

The plan this week differed slightly between companies. Since I knew this was my last week to make any changes to the final worth of the portfolio, I decided to play it somewhat safe by limiting myself to selling shares in coordination with observing the trends of the stock itself.

Apple Inc.'s stock trends this week began with a day of stable prices on Monday 27th, it then went on a downtrend beginning the 28th, toward a W shaped countertrend before attempting an uptrend back on the 1st July towards the initial price on the 27th June. The high point for Apple Inc. this week sat at \$141.66 closing on the 1st July, with the low point at a \$136.72 the day before on the 30th June. Not foreseeing the drop in share price for the 28th June or the countertrend that

would follow, I made a slightly more rushed decision to list my shares in Apple at a limit price of \$138.00. The shares then shortly after sold for \$138.00 marking a total sale of \$11,040.00 exactly. This sale of \$11,040.00 marks a loss of \$672.00 when compared with the initial investment from the beginning of the Swing trading portfolio. Figure 4.1.4.1 below visualises the stock trend for Apple Inc. through the week of 25th June to 1st July.

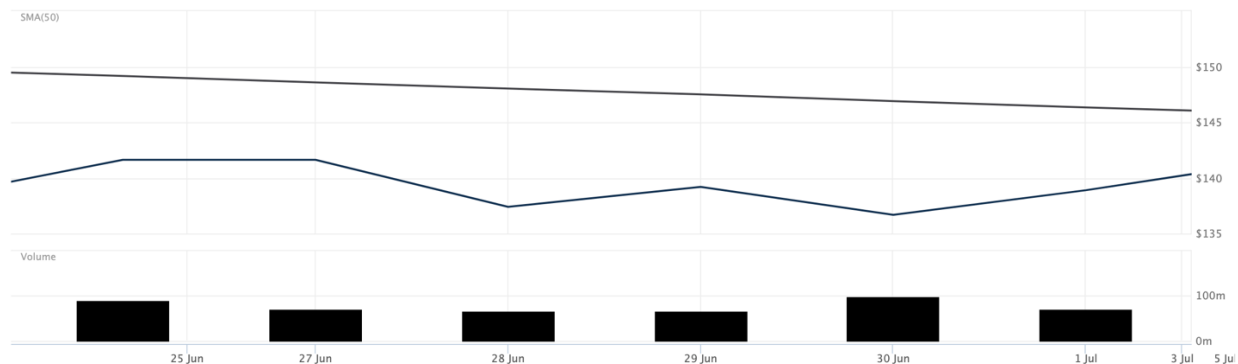


Figure 4.1.4.1: AAPL Stock Trend June 25th to July 1st via WSJ.com

Tesla's trends for the final week of this simulation fared somewhat similarly to that of Apple's. With the exception of the countertrend that Apple observed, Tesla likewise saw a downtrend in share value up until the 30th June, which an uptrend with a slope less steep than that of the downtrend then began to carry the stock value up until the 1st July. The high point for Tesla stocks this week was observed to be \$734.76 on the 27th June, with the low point sitting at \$673.42 on the 30th. I originally conducted trend observations for both Apple and Tesla simultaneously, however upon observing that Tesla would not incur the same countertrend as Apple, I made a slight gamble to hold onto my shares in Tesla until the very last day, the 1st July. On the 1st of July 2022, I listed my 10 shares in Tesla Inc. at an individual share price of \$678.60. This meant a \$6,786.00 total sale for the remaining 10 shares I possessed in Tesla Inc, along with a \$398.70 loss when compared with 10 shares from the initial investment price of \$718.47 per share. Figure 4.1.4.2 below helps paint a picture of Tesla's stock trend through 25th June to 1st July.

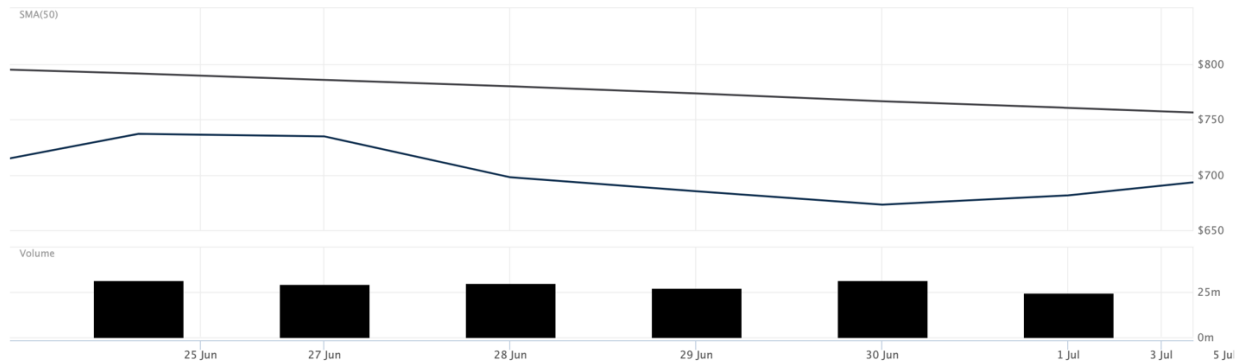


Figure 4.1.4.2: TSLA Stock Trend June 25th to July 1st via WSJ.com

Church & Dwight Co. Inc., observed an overwhelmingly better stock trend this past week than that of its counterparts. Although the same downtrend was observed between 27th June to 28th June, Church & Dwight's stocks thereafter take a contrasting trend upward. As evident in Figure 4.1.4.3, after the low point for Church & Dwight's stock on 28th June with a closing price of \$91.13, one can observe that the following days thereafter saw an undeniably strong increase in stock price – going from \$91.13 closing to \$92.36 closing between the 28th June to 29th, and then again from \$92.66 closing to \$94.25 closing between 30th June to 1st July. Although these fluctuations pale in comparison to that of Apple and Tesla's, for a stock in a market sector as stable as CHD it is a respectably significant increase.

In retrospect, it should have been clear that the industry Church & Dwight Co., Inc. has established their presence in would observe different stock trend fluctuations. However, because of the worrying sales made for Apple and Tesla, upon noting the only similarity of the downtrend between the 27th to 28th June, as soon as the individual share prices saw another uptrend, I decided I wanted to list my shares for sale as soon as possible to compensate for the losses at least somewhat from Apple and Tesla. On June 29th, I listed my shares in Church & Dwight for a stop order of \$91.50, corresponding to a total sale of \$8,692.50 for the 95 shares in my portfolio. This sale of \$8,692.50 represents a \$304.00 profit when compared with the initial investment prior to the start

of Week One. Figure 4.1.4.3 below shows the stock trend for CHD stocks between June 25th to July 1st.

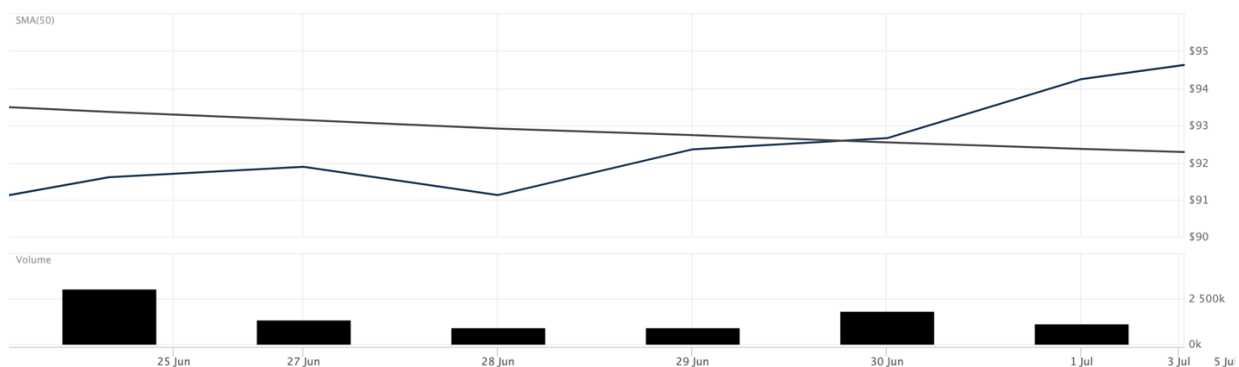


Figure 4.1.4.3: CHD Stock Trend June 25th to July 1st via WSJ.com

4.2 Results

The four-week simulation for Swing Trading ended with a profit of \$110.80. This is indubitably an insignificant amount compared to how much capital was originally available but provided a much needed learning experience through which I was able to gain a better understanding of how the stock market functions, and gain more reliability on myself to trust the research that I put in regarding trends in the stock market. Tesla and Church & Dwight were the major players in terms of stocks that returned profits, as the two combined returned more than \$1000.00 in profit. Granted, the two companies belong to different sectors of the stock market and as a result saw different stock trends during the two different weeks these same stocks were sold in. Apple and Tesla Inc. were in the red at the end of the final week, with a combined loss of just under \$1100.00. This loss in total share value was as much of a result of amateur stock trading as it was a result of inevitable fluctuations in the stock market due to volume of trades and current market trends. Table 4.2 below summarises the transactions made throughout the Swing Trading Simulation, in addition to the profit that the trading generated.

Table 4.2: Summary of Swing Trading Simulation Transactions

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
							\$50,000.00	
06/03/22	AAPL	Buy	\$146.40	80	\$11,712.00	\$0	\$38,288.00	\$0
06/03/22	CHD	Buy	\$88.30	95	\$8,388.50	\$0	\$29,899.50	\$0
06/03/22	TSLA	Buy	\$718.47	15	\$10,777.05	\$0	\$19,122.45	\$0
06/10/22	TSLA	Buy	\$655.00	10	\$6,550.00	\$0	\$12,572.45	\$0
06/17/22	AAPL	Buy	\$132.00	20	\$2,640.00	\$0	\$9,932.45	\$0
06/22/22	AAPL	Sell	\$135.14	20	\$2,702.80	\$62.80	\$12,635.25	\$62.80
06/24/22	TSLA	Sell	\$730.47	5	\$7,304.70	\$60.00	\$19,939.95	\$122.80
06/24/22	TSLA	Sell	\$730.47	10	\$3,652.35	\$754.70	\$23,592.30	\$877.50
06/29/22	AAPL	Sell	\$138.00	80	\$11,040.00	-\$672.00	\$34,632.30	\$205.50
07/01/22	TSLA	Sell	\$678.60	10	\$6,786.00	-\$398.70	\$41,418.30	-\$193.20
06/29/22	CHD	Sell	\$91.50	95	\$8,692.50	\$304.00	\$50,110.80	\$110.80

5. Buy and Hold Trading Simulation

This chapter will explain in detail the Buy and Hold Trading simulation data, which includes the amounts of initial investment, the analysis of the trends pertaining to the stock itself, and results of overall investment according to the simulation method utilised. Once again, the total initial capital available for the simulation is \$100,000.00, where I have allocated \$50,000.00 for Buy and Hold trading.

5.1 The Simulation

Dissimilar to the initial investment on the Swing Trading portfolio, our investment on the buy and hold trading simulation portfolio saw an initial investment of over \$45,000.00 on all three of the involved companies combined. The reason the initial investment here is different is due to the nature of the simulation method itself. I understood that once I purchase stocks for the buy and hold trading simulation that I would most likely not undergo any more purchases or listing of sales unless there is a significant enough price change to do so. Table 5.1 below details the capital invested into each company.

Table 5.1: Initial investment amounts in BYDDY, SPGI, and TSLA

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
							\$50,000.00	
06/03/22	BYDDY	Buy	\$72.50	220	\$15,950.00	\$0	\$34,050.00	\$0
06/03/22	SPGI	Buy	\$334.43	48	\$16,052.64	\$0	\$17,997.36	\$0
06/03/22	TSLA	Buy	\$718.47	23	\$16,524.81	\$0	\$1,472.55	\$0

5.1.1 Week One (5th – 10th Jun)

Over the course of the first week, different stock trends were observed for the three companies in the Buy and Hold Trading portfolio. For the first week, I am planning on letting the trends play out in an attempt to cash in on an uptrend in the weeks to come.

BYDDY saw a continual increase in individual share value over the course of this week, with an increase of \$7.96 per share corresponding to over a 10% growth in share value compared to the initial investment price from last week. This 10% increment in share value gained \$1,751.20 in BYD portfolio value in just the first week alone, and the trend seems to be on track for continual growth. The high point this week for BYDDY stock was \$80.46 on 10th June, with the low point at \$74.89 on 7th June. I decided to hold on to BYDDY stock this week, since there seems to be future potential for growth. Figure 5.1.1.1 below shows the stock trend for BYDDY this past week.

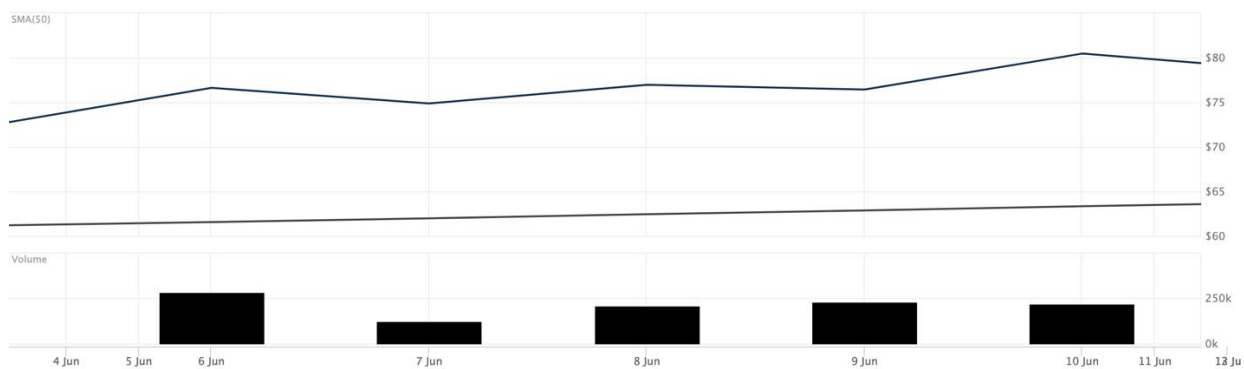


Figure 5.1.1.1: BYDDY Stock Trend June 5th to June 10th via WSJ.com

S&P Global Inc. faired quite differently in terms of stock trend this past week. Between 6th June and 7th June, SPGI saw an uptrend followed by a gradual downtrend all the way until the 10th. This downtrend resulted in a portfolio loss of \$80.16 when compared to the initial investment amount, and a \$1.67 decrease in individual share value compared to that of the initial investment share value. The high point for SPGI share price this week was \$344.46 on 7th June, with the low point sitting at \$332.76 on the 10th. This downtrend also closely mimics that of the S&P 500 downtrend for the same time period, except with a less steep slope. I decided not to sell or buy any shares in SPGI in favour that the stock trend would improve this week. Figure 5.1.1.2 below shows the stock trend for S&P Global Inc. this past week.

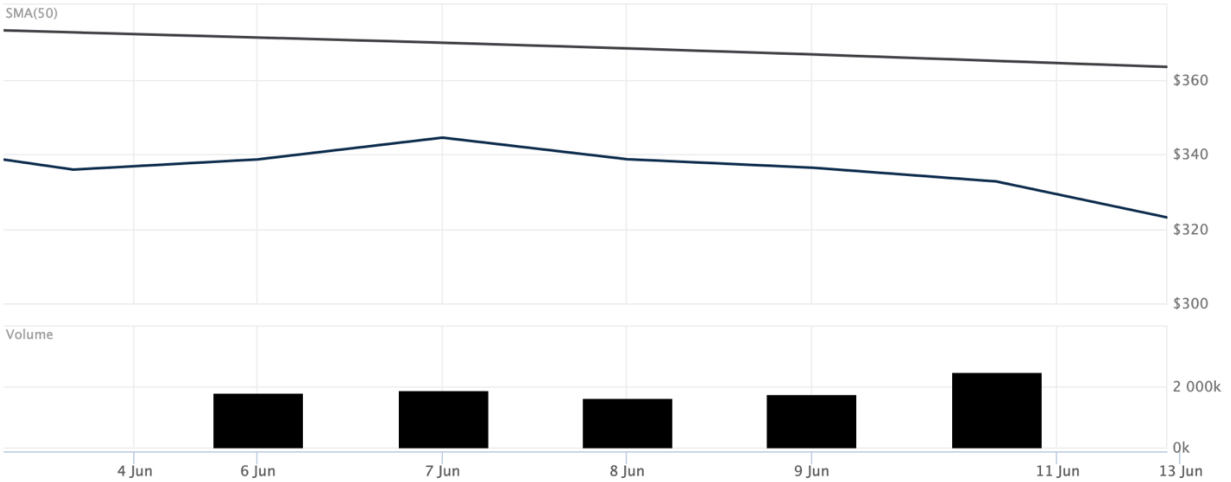


Figure 5.1.1.2: SPGI Stock Trend June 5th to June 10th via WSJ.com

Tesla Inc. observed a stable stock trend for the majority of this week, with just a small downtrend occurring between 9th June and 10th June. Figure 5.1.1.3 shows the stock trends that Tesla incurred this week, with the high point at \$725.60 on June 8th, and a low point of \$696.69 on June 10th. Since Tesla Inc. stocks exist in both the Swing Trading simulation and the Buy and Hold Trading simulation, there will be a difference observed in terms of thinking when deciding on whether or not to sell or buy. For this week, Tesla's slight downtrend resulted in a \$299.00 loss when compared with the initial investment, and upon looking at previous trend history for TSLA shares to observe for a historical pattern on downtrends and uptrends, I made a decision to not sell based on patterns I saw that had downtrends with slight countertrends that also corresponded to the S&P 500 Index, and in hopes that the downtrend would soon upturn itself again. Figure 5.1.1.3 below shows the stock trend for Tesla Inc. this past week.

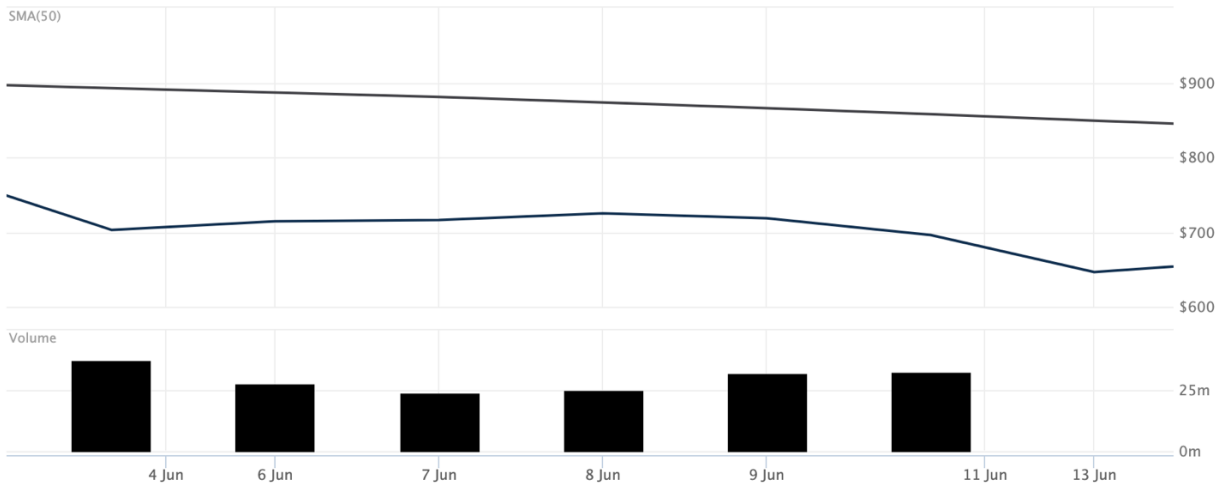


Figure 5.1.1.3: TSLA Stock Trend June 5th to June 10th via WSJ.com

The net total change in portfolio worth this week went up by \$1,372.04, mainly thanks to BYD Co. Ltd.

5.1.2 Week Two (11th – 17th Jun)

The stock market this week in respect of the S&P 500 was on an overall down, with the exception of a few small countertrends occurring for each of the three companies on this portfolio. The objective this week is to try and plan ahead for a share price that will maximise profits for each of the individual companies on the portfolio.

BYD Co. Ltd. observed a very gradual but sustained downtrend for the majority of this past week, with the exception of between the 16th and 17th June where a slight uptrend starts to form. BYD Co. Ltd.'s high point this week sat at \$78.52 closing on the 13th June, with their low point at \$74.09 closing on 16th June. Share prices in BYD at the end of this week dropped by almost 7.8%, resulting in a portfolio loss of \$1,278.20 since last week. I decided to follow the objective laid out ahead of time and plan for an uptrend that will maximise profits as much as possible. Figure 5.1.2.1 below shows BYDDY's stock trends this past week.

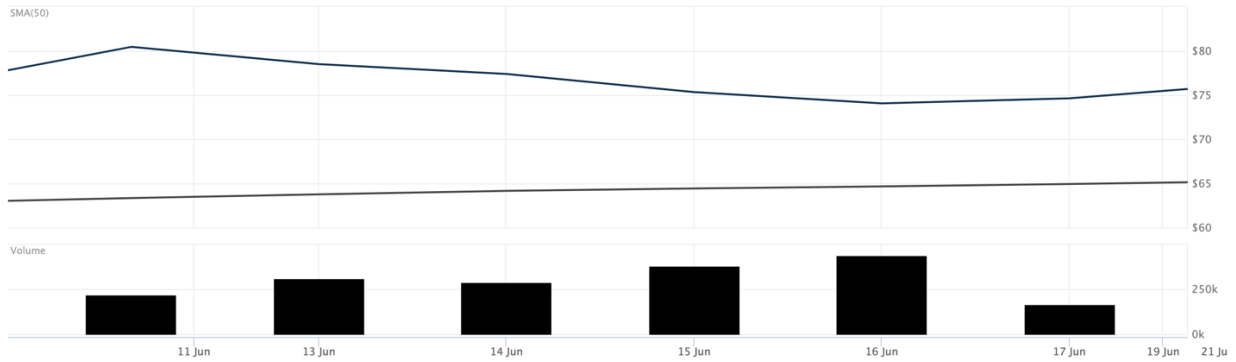


Figure 5.1.2.1: BYDDY Stock Trend June 11th to June 17th via WSJ.com

S&P Global Inc. saw an overall downtrend in share value this past week, with their high point at \$322.36 on 13th June during the downtrend, and a low point of \$316.03 on 16th June after the brief countertrend. Share prices dropped by over 4% this week when comparing the final closing price of the last market day to that of last week's. This drop in share price resulted in a portfolio loss of \$615.84 in respect to last week. Following the objective laid out for this week, and because of the apparent uptrend that was occurring starting the 17th June, I knew I had to hold on to the shares I had, in the event an uptrend with tremendous potential for return would happen. Figure 5.1.2.2 below shows SPGI's stock trends this past week.

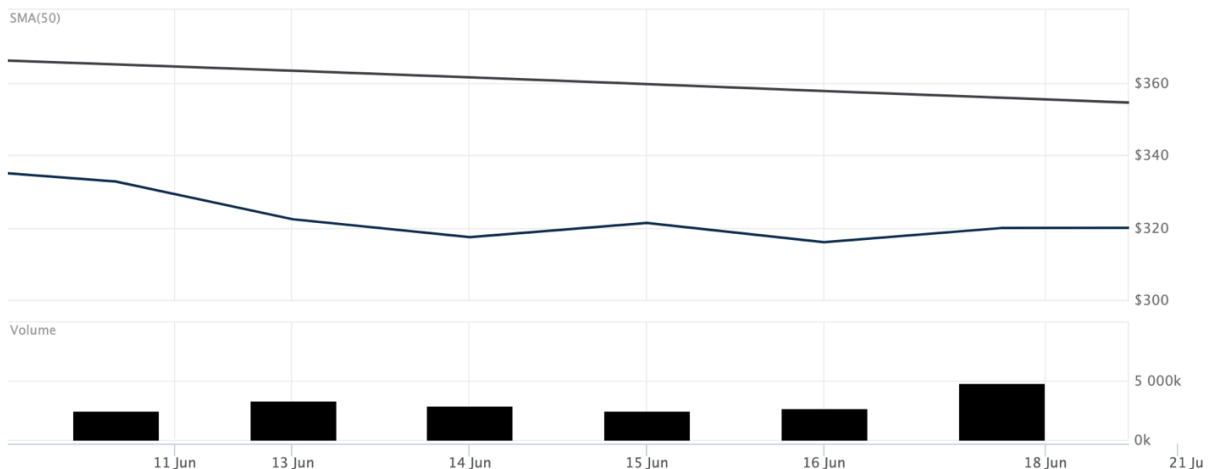


Figure 5.1.2.2: SPGI Stock Trend June 11th to June 17th via WSJ.com

Tesla Inc. this week saw a wave of uptrends and downtrends. Figure 5.1.2.3 shows the wave and visualises the high point of \$699.00 on 15th June in addition to the low point of \$639.30 the next day on the 16th. Individual share price on closing at the end of the week decreased by almost 8.5%, marking a loss of \$1,269.37 in portfolio value since last week, totalling \$1,568.37 in losses since the initial investment. I did not buy or sell any Tesla stock this week as I observed an uptrend occurring starting the 17th June.

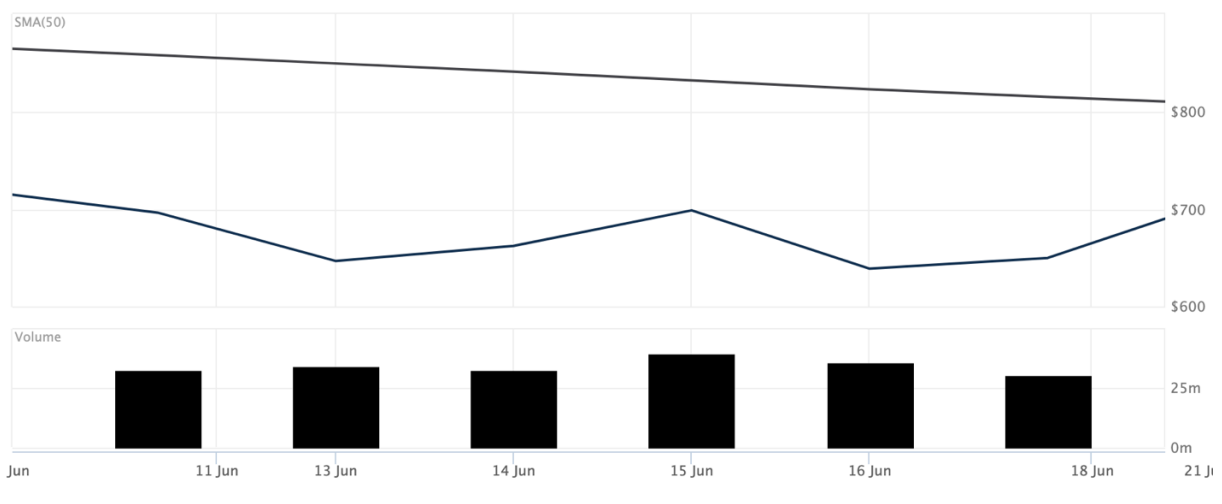


Figure 5.1.2.3: TSLA Stock Trend June 11th to June 17th via WSJ.com

The total change in portfolio value this week was \$3,163.41 in the negative direction. All companies suffered losses and this matches the S&P 500 index's trend for the given week, meaning the market for this particular segment is on a decline.

5.1.3 Week Three (18th – 24th Jun)

This week the goal is to further analyse the status of the market segment the three companies on this portfolio are in and hopefully sell some shares at a price that will return profits. The S&P 500 was on a very consistent uptrend this week, which corresponds to the trends seen by the companies on this list.

BYD Co. Ltd saw its share price rise this week up to \$79.03 at closing on 24th June, which also coincides with the high point this stock observed this week. BYDDY stock's low point for the week was recorded at \$75.56 on 22nd June. The week end price of \$79.03 would represent a \$963.60 increase in portfolio worth, however a portion of the shares were sold the day before on the 23rd June. Following the gradual decrease observed on the 22nd June, I listed 120 shares in BYDDY at a limit order price of \$77.00, and they then sold for \$77.00 returning \$9,240.00 in cash and \$540.00 in profits compared with the equivalent amount I would have gotten for the initial investment amount of \$72.50. I kept my remaining 100 shares in the event that the share price would continue to grow. Figure 5.1.3.1 below shows the stock trend for BYDDY this past week.

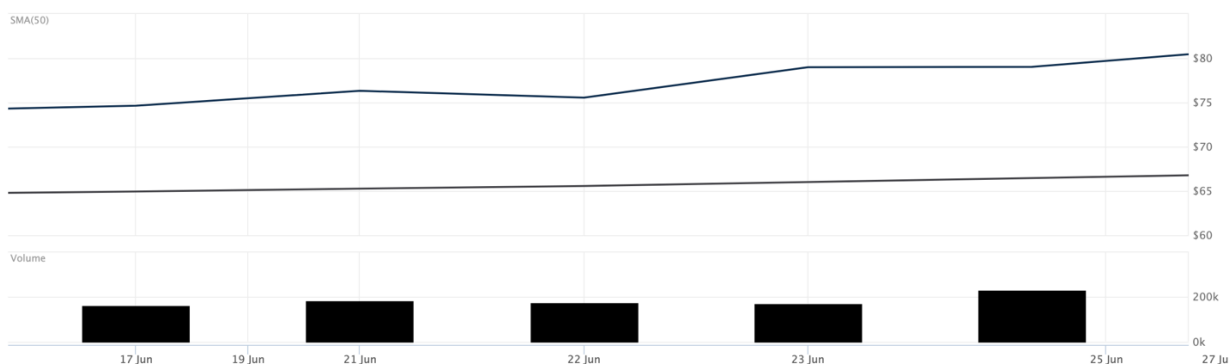


Figure 5.1.3.1: BYDDY Stock Trend 18th June to 24th June via WSJ.com

S&P Global Inc. this week saw a very drastic uptrend and increase in price. Their high point for the week was \$341.66 on the 24th June, with the low point sitting just before the uptrend at \$320.02 on 21st June. It was initially very tempting to want to cash in on this trend, however from looking at the Simple Moving Average, I noticed that the slope was decreasing in magnitude, indicating that the share price for SPGI may in fact begin moving up, even if there are downtrends in between. Learning from my mistake with BYD Co. Ltd., I opted to hold on to my shares in SPGI this week in favour of waiting out for an even higher wave. Figure 5.1.3.2 below shows SPGI's stock trend for this past week.

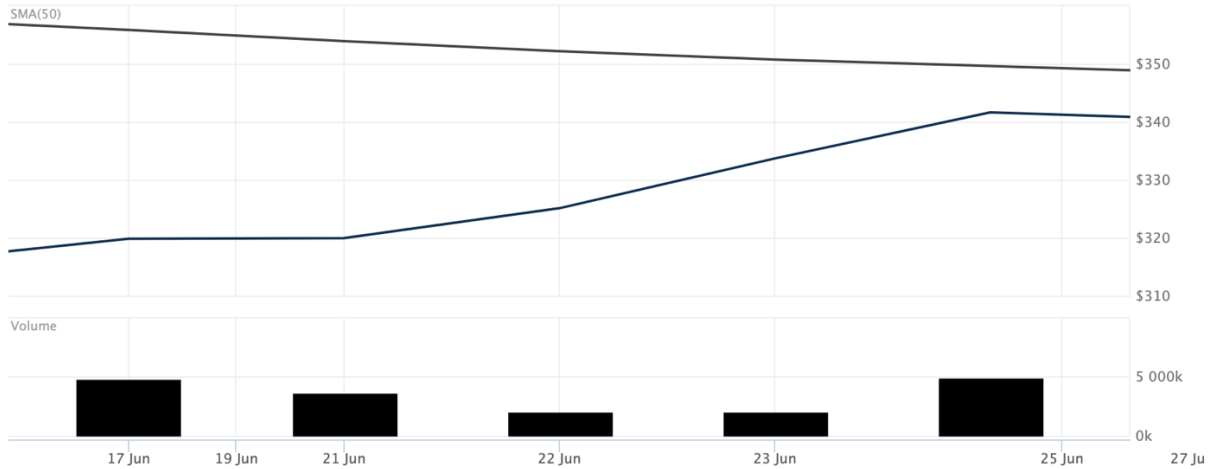


Figure 5.1.3.2: SPGI Stock Trend 18th June to 24th June via WSJ.com

Tesla Inc. saw an immediate and very drastic uptrend this week following the market opening on the 21st June. Their high point this week was \$737.12 on the 24th, with a low point of \$705.21 just the day before on the 23rd. The closing price at the end of the week represented a portfolio gain of \$1997.32 in comparison to last week’s price, and a \$428.95 gain since the initial investment. Following the same idea I had for S&P Global Inc., I decided to hold on to Tesla Inc. stock in hopes of receiving a better deal next week. Figure 5.1.3.3 shows Tesla’s stock trends this past week.

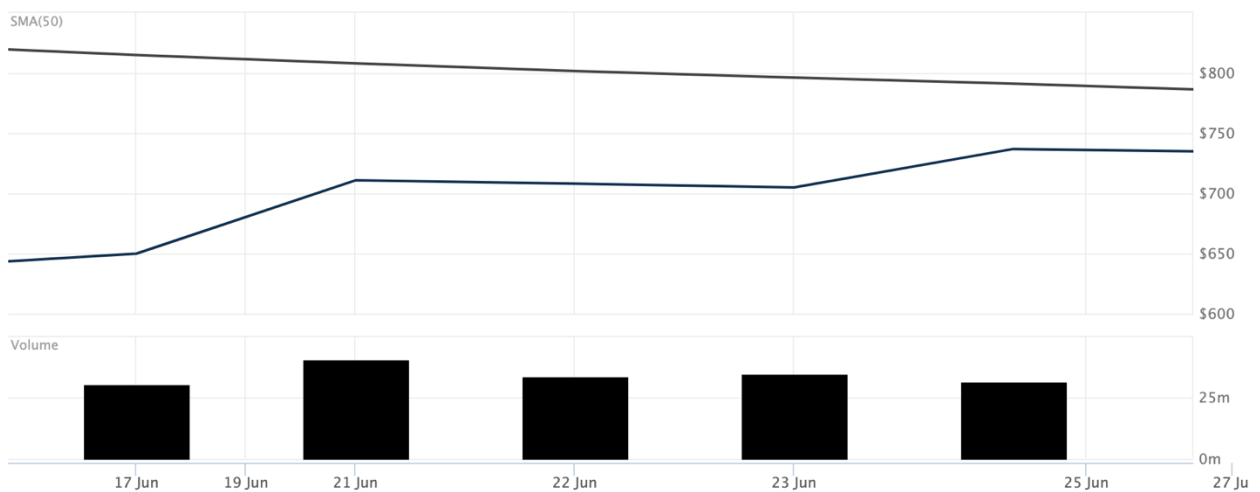


Figure 5.1.3.3: TSLA Stock Trend 18th June to 24th June via WSJ.com

The portfolio went up by \$3,478.36 this week, with the exclusion of the 120 shares sold in BYD Co. Ltd. stock. The details of the transactions for this week are in Table 5.1.3 below.

Table 5.1.3: End of Week Three Transactions using Buy and Hold Trading

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
06/23/22	BYDDY	Sell	\$77.00	120	\$9,240.00	\$540.00	\$10,712.55	\$540.00

5.1.4 Week Four (25th Jun – 1st Jul)

Week Four took a slight turn for the worse in comparison to Week Three. The S&P 500 index dipped just enough to go back in the area it was in the week before prior to the drastic uptrends. The two of the three companies in the buy and hold portfolio followed suite with Tesla Inc. being the most closely resembling company. The plan for this last week is just to find a trend point where we can either minimise losses or maximise profits.

BYD Co. Ltd saw a high point of \$84.45 this week on the 28th June, with the low point at \$80.29 a day after on the 29th June. After the price reached \$84.45 on the 28th June, I made the assumption that the uptrend would continue the next day. Due to the fact that this was the last week of the simulation, I based my decision on the previous assumption and sold my shares in BYDDY at a price of \$81.30 when the price was on the decline the next day. The remaining 100 shares in BYDDY sold at \$81.30 resulting in \$8,130.00 cash and a \$880 profit. Figure 5.1.4.1 below shows BYD Co. Ltd.'s stock trend this past week.

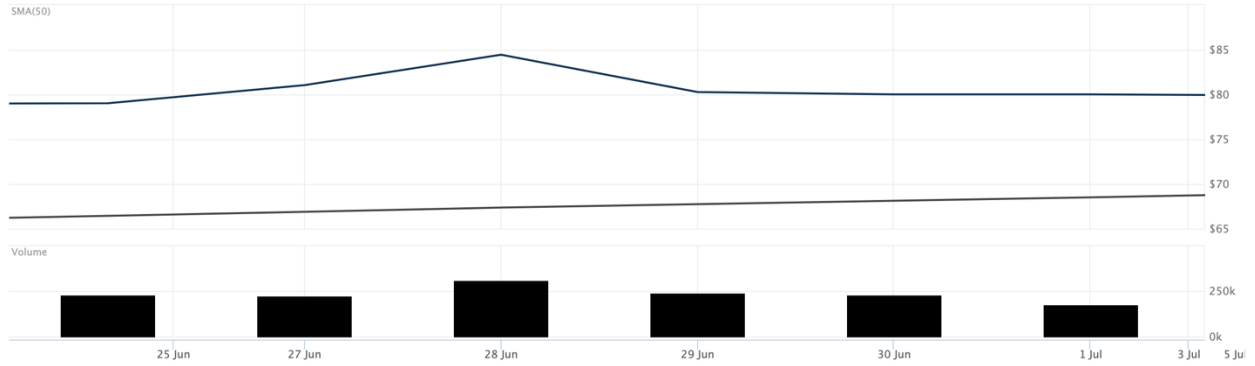


Figure 5.1.4.1: BYDDY Stock Trend June 25th to July 1st via WSJ.com

S&P Global Inc. saw a high point of \$343.33 this week on the 1st July, with the low point at \$332.70. The plan for the final week was to sell all my stocks at a price that would provide as much profit as possible, therefore when the market began a downtrend for SPGI stock on the 27th, I was worried that there would not be an uptrend for the remainder of the week, and so I listed my stock at a stop sale of \$334.43 (the price I had originally bought the stock for). The stock sold for that price in the opening hours of the next day of the 28th and so I received back my original investment of \$16,052.64. Figure 5.1.4.2 below shows the stock trend for SPGI this past week.

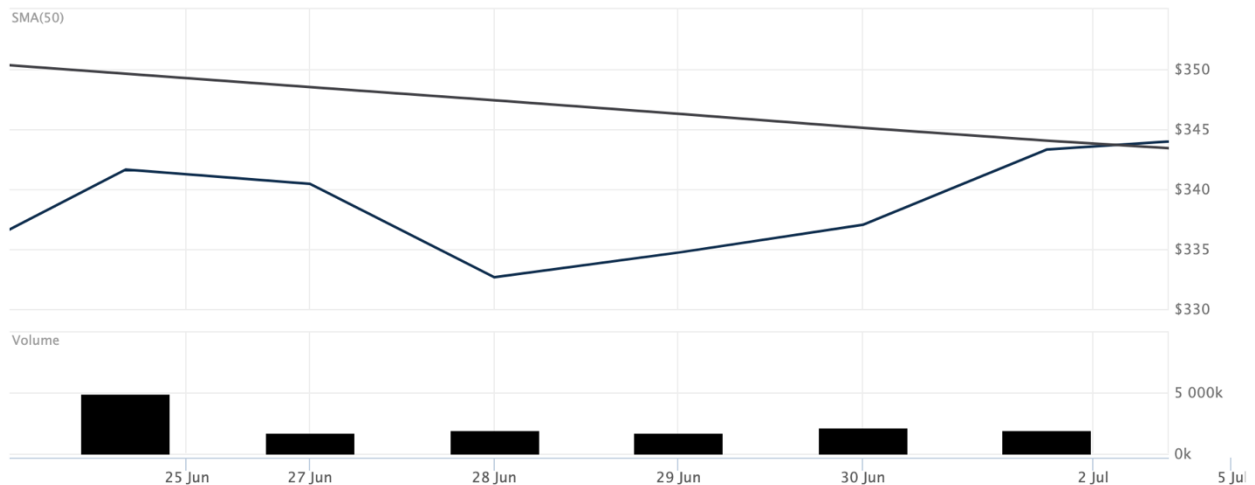


Figure 5.1.4.2: SPGI Stock Trend June 25th to July 1st via WSJ.com

Much like the other two companies on this portfolio, Tesla Inc. was also on a downtrend this past week. Up until 30th June, TSLA shares observed a downtrend starting from the 27th. Their highest point for the week sat at \$734.76 on the 27th, with a low point observed at \$673.42 on 30th June. Following the plans for the last week of the simulation, I understood the need to take action on Tesla stocks as soon as possible, either to minimise losses or attempt to maximise profits. On 29th June, upon realising that Tesla would continue its downtrend and would not follow a route like that of S&P Global Inc., I listed my shares for a stop price of \$680.00, which when sold equated to a total portfolio sale of \$15,640.00. This sale of \$15,640.00 means a total portfolio loss of \$884.81 when compared to the initial investment of \$16,524.81. Figure 5.1.4.3 shows the stock trend for Tesla Inc. this past week.

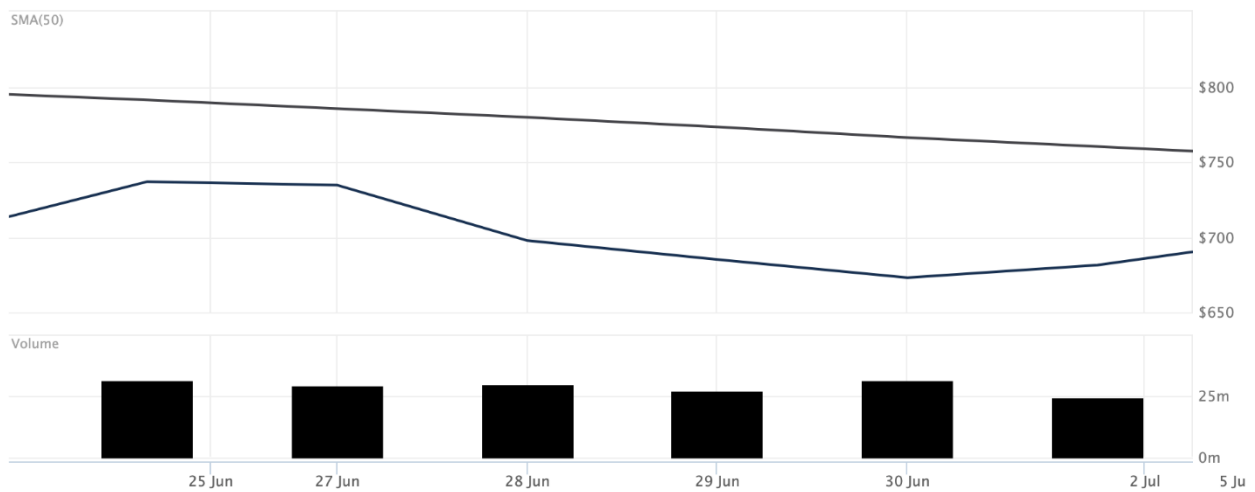


Figure 5.1.4.3: Tesla Stock Trend June 25th to July 1st via WSJ.com

The transactions for this final week are listed in Table 5.1.4 below, detailing all the sales made for this week and the profits and losses generated as a result of the sales.

Table 5.1.4: End of Week Four Transactions using Buy and Hold Trading

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
06/29/22	BYDDY	Sell	\$81.30	100	\$8,130.00	\$880.00	\$18,842.55	\$1,420.00
06/28/22	SPGI	Sell	\$334.43	48	\$16,052.64	\$0	\$34,895.19	\$1,420.00
06/29/22	TSLA	Sell	\$680.00	23	\$15,640.00	-\$884.81	\$50,535.19	\$535.19

5.2 Results

The four-week simulation for Buy and Hold Trading ended with a profit of \$535.19. Similar to the observation made with the Swing Trading simulation, the amount profited is a very small amount compared to how much capital was originally available, but provided a much needed learning experience through which I was able to gain a better understanding of how the stock market functions in a long term scenario, and how to effectively capitalise on stock trends in that regard. BYD Co. Ltd. was the only stock that returned profits during this simulation, and this was not an unexpected outcome due to the drastically changing stock prices observed in their stock history. With that said, there were at least two companies, Tesla and BYD, that belonged to the same sector of the stock market, however the difference in stock trends observed can only be explained by the market the companies' target. Tesla Inc. was in the red at the end of the final week, with a combined loss of just under \$1100.00. A further analysis of any differences noticed between the Swing trading method and the Buy and Hold method, especially in regard to Tesla Inc., will be examined in the next chapter. Table 5.2 below summarises the transactions made throughout the Swing Trading Simulation, in addition to the profit that the trading generated.

Table 5.2: Summary of Buy and Hold Trading Simulation Transactions

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Cash on Hand	Total Profit
							\$50,000.00	
06/03/22	BYDDY	Buy	\$72.50	220	\$15,950.00	\$0	\$34,050.00	\$0
06/03/22	SPGI	Buy	\$334.43	48	\$16,052.64	\$0	\$17,997.36	\$0
06/03/22	TSLA	Buy	\$718.47	23	\$16,524.81	\$0	\$1,472.55	\$0
06/23/22	BYDDY	Sell	\$77.00	120	\$9,240.00	\$540.00	\$10,712.55	\$540.00
06/29/22	BYDDY	Sell	\$81.30	100	\$8,130.00	\$880.00	\$18,842.55	\$1,420.00
06/28/22	SPGI	Sell	\$334.43	48	\$16,052.64	\$0	\$34,895.19	\$1,420.00
06/29/22	TSLA	Sell	\$680.00	23	\$15,640.00	-\$884.81	\$50,535.19	\$535.19

6. Analyses and Data Comparison

This paper detailed the simulation process for two different trading methodologies, the Swing Trading method and the Buy and Hold method, throughout the course of four weeks. These two strategies both saw returns that can be understood as influenced by the overall trend of the stock market. During the course of the four-week simulation for both methods, there was an evident overall downtrend in the stock market, as observed from examining the S&P 500 index, shown in Figure 6.1 below, since April of 2022. The trend for the S&P 500 index over the past quarter will be used as a control to compare against the two other strategies used in this simulation, and will additionally provide us with a better insight into how the companies with relation to the index connect to the trends that the index observes. The value of the S&P 500 on June 6th on the first trading day of week one of the simulations was \$4121.43, and \$3825.33 on July 1st on the last trading day of week four of the simulations. This decrease of \$296.10 represents over a 7% decrease in value over the course of four weeks during this simulation, a figure that largely resembles those seen throughout the simulations.

Corresponding to the trend seen in Figure 6.1, the companies that are in the index have also seen a gradual decrease throughout the past quarter in addition to the past four weeks of this simulation. The companies that are not contained within the index did not see the same intervals of declines in share value, but were still affected by the overall recession observed in the stock market in the past few weeks.



Figure 6.1: S&P 500 Index Trend March to July 2022 [33]

The Swing Trading portfolio gained a sum of \$110.80 above the original capital available. This figure represents a very miniscule increase of just over 0.2% of the total portfolio value. To many investors, this minute increase in the given time for the Swing Trading portfolio would be considered a failed investment portfolio. Given the performance of the S&P 500 index in the same timeframe however, this 0.2% gain was a good initial attempt at gaining a foot in the stock market. Figure 6.2 below shows the performance of the Swing Trading portfolio throughout the course of the past four weeks.



Figure 6.2: Swing Trading Portfolio Value

Figure 6.3 below shows the companies in the Swing Trading portfolio and their overall profits/losses after the four-week period. Apple Inc. was observed to have had the most significant loss and such was largely reflected in the decline of the S&P 500 index. Apple was selected because of its reputation as a company in the technology sector with very stable foundations in the stock market, however the technology sector did suffer quite a bit as is visible in the S&P 500 index and in the technology companies belonging to the Buy and Hold portfolio.

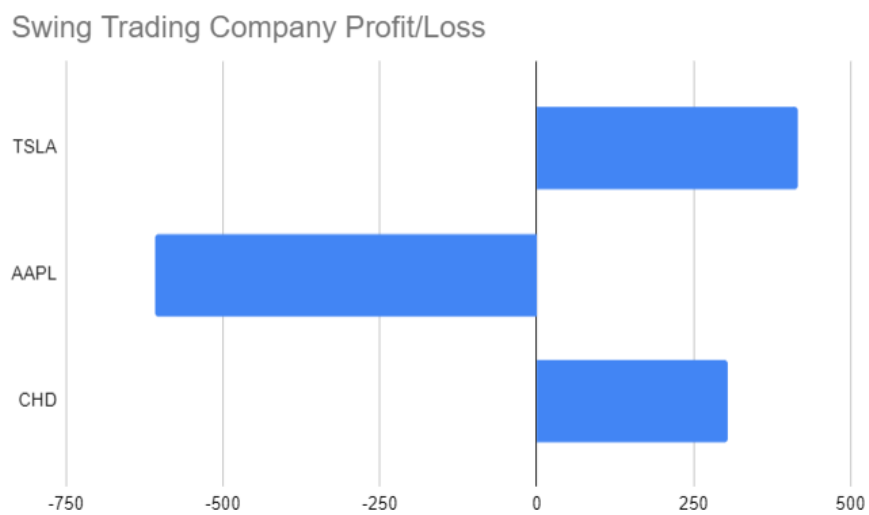


Figure 6.3: Swing Trading Company Profit/Loss

The Buy and Hold portfolio saw slightly different performances in terms of value and individual company profit/loss. Figure 6.4 below shows the performance of the Buy and Hold trading method through the course of the past four weeks.

Portfolio Value Buy and Hold Trading

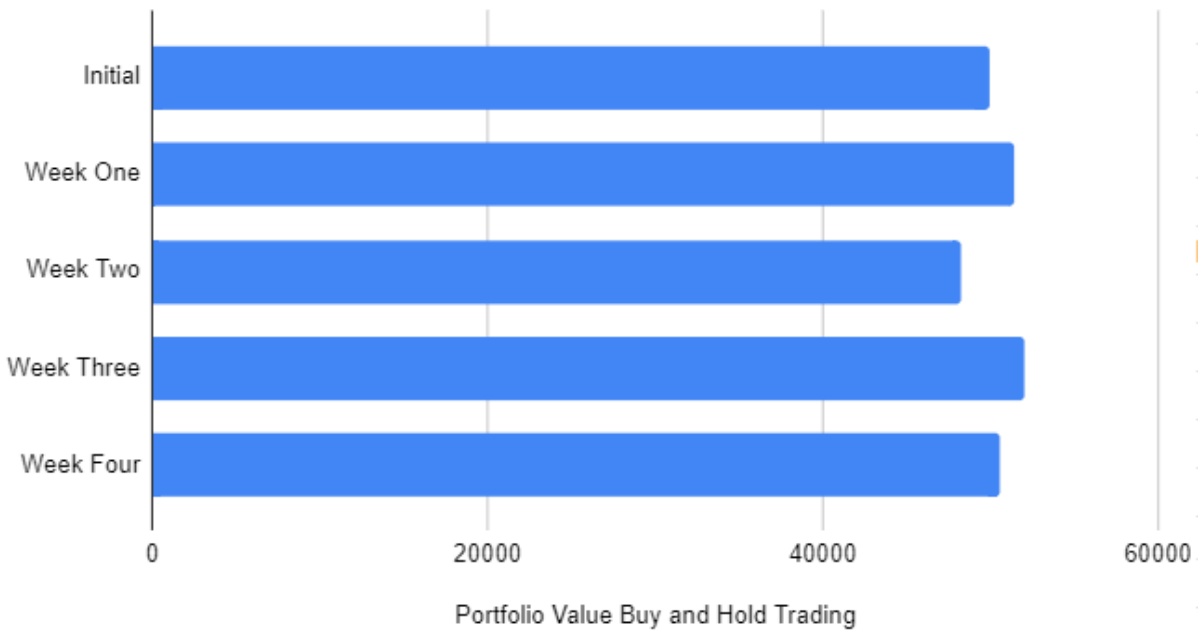


Figure 6.4: Buy and Hold Trading Portfolio Value

The portfolio gain for the Buy and Hold trading method was \$535.19, representing just over a 1% increase. This increase is definitely more significant than the 0.2% from the Swing Trading portfolio, but cannot be defined as an absolute success due to the nature of capital available in addition to the Buy and Hold method used. Much of the profit seen from the Buy and Hold portfolio is also attributed to the volatility of BYD Co. Ltd.'s share value and although shares for BYDDY were sold on a downtrend, the sale price was still higher than that of the initial investment price.

Much of the loss for the Buy and Hold portfolio is attributed to Tesla Inc., as their shares were sold with a -\$884.81 loss at the end of week four. This is the exact opposite of what was

observed with Tesla Inc. stocks via Swing Trading, which we can assume to mean that the volatility of a stock such as Tesla's works better when trading with a more fluid trading strategy. Figure 6.5 below details the gains and losses of each of the three companies on the Buy and Hold trading portfolio, along with S&P Global Inc.'s profit which sat at 0 due to a sale of shares at the original investment price.

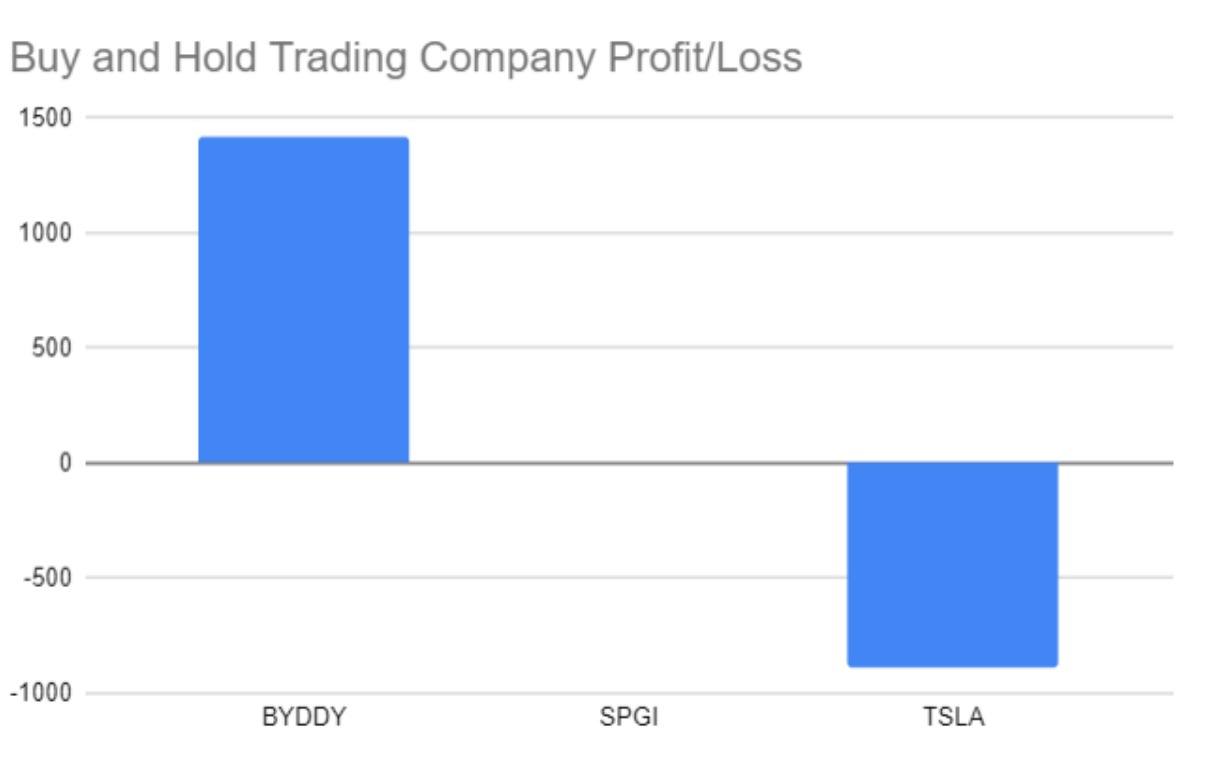


Figure 6.5: Buy and Hold Trading Company Profit/Loss

7. Conclusion

Based on the information derived from the analyses of Chapter 6, the Swing Trading strategy still seems to be the most robust technique for stock trading in a timeframe such as the four weeks allotted for these simulations. Although the Buy and Hold trading method returned more profit, it cannot be attributed to the trading methodology itself but more so to the volatility and trend of the stock being traded at the time. Of course, this conclusion may be different if given more time to analyse both trading methods for short and longer periods of time, however for the purposes of this simulation, the Swing Trading method is favoured due to the credibility of a profitable return as a result of the trading strategy itself. It is worth mentioning however that both trading methods returned a profit, which regardless of significance signifies that both trading methods along with the strategies imposed are effective in investments to an extent.

This project found success in all the milestones it set out to achieve. I managed to gather a much better understanding of the background involved in the stock market, the terminology used in the stock market, the fundamental method of analysis of stock trends in the stock market, and familiarised myself with how to operate in and around the market. The amount of research conducted played a very crucial role in the success of this experiment, and helped achieve another very important milestone of learning the skills and gaining the experience necessary to further my skills in stock market investment. Profit was made during this simulation, and although insignificant, allows for the conclusion that with enough time and practice, these results can improve.

This project taught me a great deal about the stock market. It has educated me on the power of investments and the potential for success in the stock market.

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