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Stock Market Simulation

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Wonjae Jang _____

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Approved by Professor Dalin Tang, Project Advisor

Abstract

The objective of this project was to learn how to invest in the stock market. A four-week stock market simulation was performed using technical and swing trading strategies and TDAmeritrade's trading platform. A \$100,000 initial investment was made for each method, with the intention to make profit through trading using the two different trading strategies. The technical trading strategy strictly traded with Microsoft and Netflix. It netted a profit of \$4521.80, a 4.5% increase in the portfolio after 4 weeks. The swing trading strategy strictly traded with Apple and Disney. It netted a profit of \$33,693.45, a 33.7% increase in the portfolio after 4 weeks, mostly trading through the news. While the results showed that Swing Trading had better return, the difference could be caused by the differences of companies selected. Simulations using more companies should be performed for further investigations.

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1. Introduction

The objective of this project is to immerse myself in the stock market, taking a deep dive into how the market operates, discovering what affects the market, and how to successfully trade within the market. After learning about the operations of the market and successful strategies, we will be trading using a simulation of the real stock market and attempt to net a positive income after a four week trading period, using two different trading strategies.

In this section, we will be discussing the introduction of the stock market to the world and how the stock market has become what is it today. We will be starting with its inception in Belgium in 1531 as an investing and trading of notes and bonds, to the current day high speed trades over internet and even through apps on a smartphone.

1.1 The History of the Stock Market

The first stock exchange was created in Antwerp, Belgium in the year 1531. Before the inception of the first stock market, Antwerp was a bustling port city, mainly due to its geographic position. It was positioned convenient at the mouth of an inlet that led directly into the ocean. This allowed the city to trade with many others and have much economic success during its existence.

The port city was first popular due to the abundance of trade in cloth, silk, sugar, and diamonds. Through the 14th century, the port city expanded, creating breweries (Encyclopedia Britannica, 2020). The prosperity of the city led to the opening of the first stock exchange in 1531 where brokers and investors would meet with local businesses, the government, and individuals. These trades were strictly in promissory notes and bonds, not stocks (Beattie, 2020).

The East India Companies were the next example of a stock exchange. In the 1600s, the East India Companies were formed to fund voyages from West Europe to the East Indies and Asia. There were many risks involved when voyaging over long distances. To lower these risks, ship owners

looked towards the East India Companies to cover voyages, in return for a portion of the profit if the voyage was successful. Investors would buy stocks within the East India Companies and would receive dividends on the profits from the voyages (Beattie, 2020). Both the trading at Antwerp and the East India Companies were done completely on paper. Because of this, papers could be traded. With no government regulations, dividends were often left unpaid and the system began to fail. This is why the present stock market is heavily regulated. The first government regulated stock market was formed in London in the year of 1773. These regulations were formed to create a concrete system that would discourage fraudulent traders. With rules and a membership fee to participate within the exchange, the London Stock Exchange became the first regulated stock exchange (Chen, London Stock Exchange (LSE), 2020).

As technology developed over the next two centuries, many improvements to the stock market would be put into place. With the invention of telephones, market orders could be placed from anywhere. However, the greatest improvement to the stock market was the introduction of the National Association of Securities Dealers Automated Quotations market (NASDAQ) in 1971. NASDAQ was different from the current system of brokers trading on a floor from 9 am to 4 pm. Instead, NASDAQ was formed to allow a computerized bulletin board to post bids and offers.

This computerized bulletin board sped up the trading process and in the 1980s, paved the way to an electronic trading system. With technology booming, trading became even faster. With the introduction of personal computers and internet traffic increasing in the late 1990s, online brokerage firms came into existence, who offered reduced commission and fees due to the automatic nature of the transactions. This generated an immense amount of interest within online trading, creating a decline of popularity in floor traders (Pisani, 2010). This brings us to the present day where most individuals can trade commission free on many online platforms from the comfort

of their own home. Some online platforms consist of E-Trade, IBKR, TD Ameritrade, and Fidelity. However, these online platforms have become even more simplified to apps, drawing in an even larger consumer base. Some of these online platforms consist of Robinhood, Atom, and Webull.

1.2 Factors of the Stock Market

When trying to understand the direction that the stock market may head in, an investor must take into consideration the following factors: world events, interest rates, and internal developments.

Overall, world events can have an enormous impact on the stock market as a whole. A world event could be a natural disaster, a pandemic, or war. Any event that would drastically alter the daily lifestyle of a large group of people could be considered a world event. One example is actually right now. At the time of writing this, we are living through the COVID-19 outbreak, classified as a global pandemic. This outbreak has caused global market crashes.

Another factor of the stock market is interest rates. Interest rates are an indicator as to how the economy is doing as a whole. When interest rates are on the rise, people are more likely to save money, reducing demand. When interest rates are low, people are more likely to increase spending, which typically means the economy will do well. A great indicator is the Federal Reserve System, or better known as The Fed. In the United States, The Fed controls the federal funds rate, an interest rate that is set as a recommended rate for all banking institutions to follow. When The Fed lowered the federal funds rate was lowered to a range of 0 to 0.25% in March of 2020 in response to the COVID-19 pandemic, it is commonly seen as a tactic to give an artificial boost to the economy.

The last factor is internal developments. When looking to invest within a company, it is important to know an in-depth background of the company and what they stand for. One key part of the background of a company to know its product or service and the direction in which the company

is moving towards. Another is the culture and workforce of a company. Successful companies have a well-educated workforce and leaders. Without a productive workforce, a company cannot perform nor create revenue.

1.3 Stock Market Index

The stock market is measured in various ways. One way is with an index. An index consists of a hypothetical portfolio of certain related investments within the market. Indexes could consist of different industries or be based off of location. These portfolios create a benchmark and overall health of a market segment. An index can be calculated through various weights, such as market-cap, revenue, float, and fundamental weighting. Market indexes are largely used to benchmark the performance of a stock compared to the stocks within the index and to create investable index funds. The most popular indexes consist of the S&P 500, Dow Jones Industrial Average, and the Nasdaq Composite (Young, 2020).

1.3.1 S&P 500

The S&P 500, or Standard & Poor's 500 Index, is an index consisting of the 500 largest U.S. publicly traded companies. The index uses a market-capitalization weight, meaning it favors companies with a higher market cap. This however has its limitations when it comes to companies that become overvalued, inflating the price of the index. However, it accurately depicts the total value of companies, unlike other indexes that give more weight to the cost of the individual stock. Overall, the S&P 500 is considered representative of the market as a whole because these top 500 companies hold a substantial percentage (Kenton, S&P 500 Index - Standard and Poor's 500 Index, 2020).

Currently, the S&P 500 is valued at \$3041.31. Over one year, the S&P 500 has had a 3.03% growth, when it was valued at \$2950.46 in June of 2019. The market summary since 1978 is shown by Figure 1.1.



Figure 0-1: S&P 500 Market Summary from 1975 to 2020 from MarketWatch

In Figure 1.2, we can observe the S&P 500 over the past year. There was a steady increase until February/March of 2020, when COVID-19 was raised to a global pandemic scale, and there were major sell offs. Over the past couple of months during quarantine, the market has gradually recovered back to its previous state.



Figure 0-2: S&P 500 Market Summary from July 2019 to July 2020 from MarketWatch

1.3.2 Dow Jones Industrial Average

The Dow Jones Industrial Average (DJIA) is an index that consists of 30 publicly owned blue chip companies. Blue chip companies are well recognized and financially stable companies. The DJIA is price weighted, unlike the S&P 500. Because of this, even though some companies may have a higher market cap, the weight of a company could be higher due to its higher price.

The Dow is often criticized for its price weighted index, as the price of a stock does not always indicate a company's worth, unlike a market cap. The Dow also only indexes 30 blue chip companies, which means that overall, The Dow will be on the rise, which may not always be the case for the rest of the economy. Currently, The Dow is valued at \$25,605.54. Over one year, the Dow has had a 4.26% decline, when it was valued at \$26,719.13 in June of 2019. The market summary since 1978 is shown in Figure 1.3.

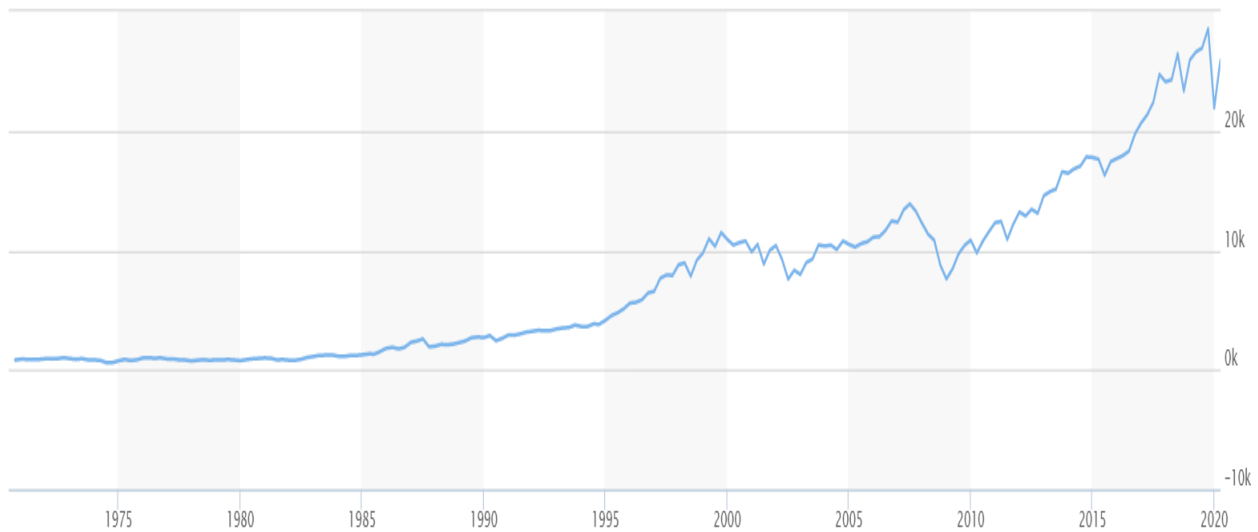


Figure 0-3: DJIA Market Summary from 1975 to 2020 from MarketWatch

In Figure 1.4, we can observe the DJIA market summary over the past year, from July 2019 to July 2020. Like the S&P 500, we see a steep sell off as the global pandemic occurred. However, the DJIA has not recovered back to its original state. This may be because many of the DJIA contains industrial companies that may have restrictions in bringing back people to their industrial zones for labor, so they haven't been able to produce at full capacity yet.



Figure 0-4: DJIA Market Summary from July 2019 to July 2020 from MarketWatch

1.3.3 Nasdaq Composite Index

Nasdaq is an index that primarily focuses on technology stocks. It is the world's first electronic exchange and lists most of the technology giants such as Amazon, Apple, Facebook, and Tesla. The Nasdaq is a market capitalization-weighted index which means the index is weighted by the market cap of the companies within the index. Market capitalization-weighted indexes are sometimes criticized because higher market cap companies within the index may share much more weight than smaller companies within the index and distort the view of the market (Chen, Capitalization-Weighted Index, 2019).

Currently, the Nasdaq is valued at \$9,946.12. Over one year, the Nasdaq has had a 23.8356% increase, when it was valued at \$8031.71 in June of 2019. The market summary since 1975 is shown in the Figure 1.5.

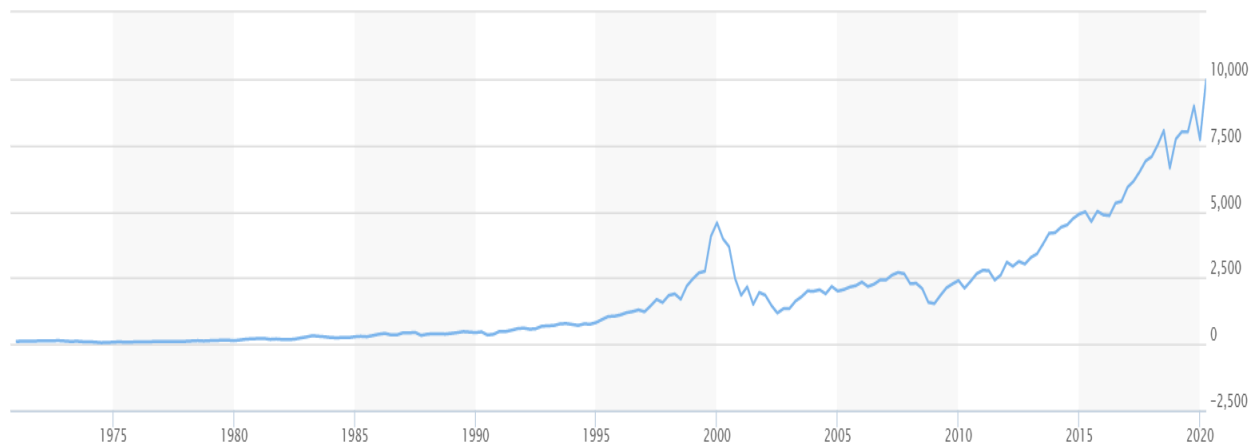


Figure 0-5: Nasdaq Composite Index Market Summary from 1975 to 2020 from MarketWatch

In Figure 1.6, we can observe that the Nasdaq Composite Index over the past year has been doing very well, recovering even past the point at which it was at before the pandemic. This is mostly due to the companies within this index heavily benefitting from the work from home lifestyle.



Figure 0-6: Nasdaq Composite Index Market Summary from July 2019 to July 2020 from MarketWatch

1.3.4 Russell 2000 Index

The Russell 2000 Index consists of the bottom 2000 companies within the Russell 3000 index. The Russell 3000 Index consists of 3000 of the largest stocks within the U.S which accounts for approximately 98% of the investable U.S. stock market. Both are market-cap weighted indexes. The Russell 2000 Index is commonly used to indicate the entire market rather than including the highest cap stocks which would create bias within the index (Chen, Russell 2000 Index, 2020).

Currently, the Russell 2000 Index is valued at \$1418.63. Over one year, the Russell 2000 Index has had a 6.65618% decrease, when it was valued at \$1519.79 in June of 2019. The market summary since 1987 is shown in Figure 1.7.



Figure 0-7: Russell 2000 Index Market Summary from 1987 to 2020 from MarketWatch

In Figure 1.8, we can see the Russell 2000 Index over the past year. As we discussed earlier, the Russell 2000 Index is a good indicator for the entire market, not just the top performing stocks. In Figure 1.8, we see a steep sell off of stocks in February to March and it has not been able to climb back up to its original point before the sell off. This shows the market is not doing well in general, even though big stocks in the NASDAQ may be showing profits.



Figure 0-8: Russell 2000 Index Market Summary from July 2019 to July 2020 from MarketWatch

Reviewing the above indexes with current events, such as the COVID-19 pandemic, we can see that the Russell 2000 Index is true to the current small-cap stocks. Unlike the other indexes that are skewed by top stocks, the Russell 2000 Index contains medium to small-cap stocks which makes it more representative of the economy as a whole. This is why we have seen a decrease over the past year, while the other indexes that measure through market-cap have seen an increase because of top stocks such as Amazon and Facebook.

2 Methodology

Within this section, we will be discussing the different types of trading that exists, ranging from technical, swing, and day trading. We will also be discussing the different types of data analysis that can be done while trading, which are fundamental and technical analysis. Finally, we will be going over the simulation engine that will be used during this experiment.

2.1 Trading Techniques

There are 5 main ways of trading. These are technical, swing, momentum, fundamental, and day trading. In this study, we will be looking into technical, swing, and day trading. I plan to study and execute these trades in the coming sections. For the two trading techniques we will not be executing, this is a quick definition. Momentum trading consists of trading stocks that are moving in one direction in large quantities for a period of times. Momentum traders take advantage of these movements. Fundamental trading looks into the background of the company, trading based off of earning reports, acquisition, etc. (Palmer, 2019).

2.1.1 Technical Trading

Technical trading consists of looking at charts and graphs and recognizing patterns from past data to determine what may happen. Commonly, technical traders look at indicators that may give tell-tale signs of the future stock movement. Some of these are RSI, range trading, pattern analysis, trend analysis, and gap analysis.

RSI stands for Relative Strength Index. This index is a momentum indicator that calculates the magnitude of recent price changes to evaluate overbought or oversold conditions in the price of a stock. This value calculated by the RSI range from 0 to 100%. When the RSI of a stock is above 70%, it is commonly said to be overbought, and when the RSI of a stock is below 30%, it is

commonly said to be oversold. Typically, when the RSI goes beyond these thresholds, they rebound in the opposite direction. However, the RSI can stay beyond these thresholds when stocks have significant momentum in a direction. In situations where a stock is doing great due to some news, the RSI would report being overbought and would signal a sell, however, would continue to stay overbought. In conclusion, the RSI should be used in oscillating markets. (Chen, Relative Strength Index (RSI), 2020).

Range trading consists of creating support and resistance levels within charts of a stock. Support and resistance levels are created by creating a line that lines up with the lowest or highest points of a stock during a period of time. Support lines are created to be set as a minimum that stocks will not fall below, and resistance lines are created to be set as a maximum that stock will not exceed beyond. These price levels are points in which the stock has had difficulty falling below or reaching above. Of course, these levels can be broken out of to go past resistance or below support. Breakouts are indications that traders should either jump in when going past resistance and get out when dipping below support. Breakouts are more likely to continue when high volumes are being traded, and less likely to continue when relatively low volumes are being traded (Mitchell, Breakout Definition and Example, 2020).

Trend analysis uses the MACD, moving average convergence divergence. MACD is a moving average that indicates a stock's past average price. The MACD is calculated by taking the 12 period exponential moving average and subtracting the 26 period exponential moving average. Investors use the MACD to find crossovers. When the MACD crosses above the current price, this indicates a buy, while when it crosses below the current price, this indicates a sell. The speed in which crossovers occur is also taken into account to determine whether or not a stock is being overbought or oversold (Hayes, Moving Average Convergence Divergence - MACD, 2020).

2.1.2 Swing Trading

The objective of swing trading is to find a potential price move and capitalize on it. Swing traders generally have holdings times ranging from overnight to a few weeks. Unlike technical trading that can happen over long periods of times, swing trading generally happens within days.

Swing traders find trends, whether they be upwards or downwards, and attempt to profit off of them. Within a bullish market, swing traders would buy stocks and create stop loss points, buying low and selling high. The objective is to capture the uptrend and sell before the stock decreases to the stop loss point (Mitchell, Guide to Swing Trading, 2020).

On the downwards trend, swing traders would short shares, meaning they bet against a stock. This happens by borrowing shares that are to be bet against. Then, you sell the shares and wait for the stock to fall in price before buying the stock at the lower price point. Afterwards, you return the borrowed stocks. By capturing the difference in this downward trend, a swing trader is able to profit off of the loss of a stock. However, shorting a stock is a huge risk. If a stock rises in price, the trader loses the difference from the bought price to the current higher price. When trading by buying stocks, the most you can lose is the amount of money used to purchase the stock. However, when shorting a stock, theoretically, one can lose an infinite amount of money. This would occur if the stock were to rise in percentage. For example, if we shorted stock EXAMPLE at \$100, and it rose to \$1,000,000 the next day, we would owe \$999,900. However, if we bought stock EXAMPLE at \$100, and the next day it went to \$0, we would lose \$100. This is why shorting a stock can be a risk, as you can theoretically lose an infinite amount of money.

2.1.3 Day Trading

Day trading is a completely different type of strategy compared to technical and swing trading. Day traders are usually well funded. Using their high base capital, they employ short-term

strategies that take advantage of small term price movements. Day traders typically make multiple trades during a single day. Because of this, they must typically have to start off with more than \$25,000. This is due to Pattern Day Trader laws. A pattern day trader (PDT) is a trader who executes four or more day trades during five business days using a margin account (Chen, Pattern Day Trader, 2020). This rule states that people who fall under the PDT category are required to hold a minimum of \$25,000 within their margin account. Otherwise they cannot trade and can have penalties placed on them.

Day traders typically trade the news and scalp a market. Trading the news is simple. Based off of different current events, traders will buy and sell different markets. For example, if a company's CEO resigns, a day trader may short the stock. Another example would be if a company's earnings for a quarter were released and there was a large, non-estimated profit. A day trader would take advantage of this and buy shares of this company. On the other hand, day traders also scalp a market. This is by taking advantage of minute difference within a stock's price. Scalpers take very small profits on individual trades. This strategy has a lot less risk involved; however, a large loss can remove many small gains.

2.2 Data Analysis

There are 3 main techniques of data analysis when stock trading: fundamental analysis, technical analysis, and ratio analysis. Fundamental analysis focuses on measuring intrinsic value by observing similar economic and financial factors. Fundamental analysis aims to determine a stock's fair market value. By finding stocks that are trading above or below their fair market value, traders can buy or short the stock to create a profit. Technical analysis focuses on looking at an investment's history in volatility and price. Ratio analysis is a supportive analysis that looks into a company's financial statements to find information. Ratio analysis is typically used in

conjunction with other analysis tactics and is not used on its own. In this project, we will be using fundamental and technical analysis to trade.

2.2.1 Fundamental Analysis

There are two main types of fundamental analysis. There is quantitative and qualitative fundamental analysis. Quantitative fundamental analysis strictly looks at quantitative data in economic and financial factors. Some quantitative fundamentals are balance sheets, income statements, and statement of cash flows (Segal, 2020). Balance sheets are a list of company assets, liabilities, and equity. Income statements show the revenue and profit of a company. Finally, statement of cash flows show how money is being invested and used in the overall business operation. Overall, these quantitative fundamentals show an overarching summary of a company's value and can help investors determine a fair value.

The quantitative fundamental analysis we will be using in this project will be the profitability ratio. Profitability ratios are simply put as a ratio of a business's earnings versus operation costs. Profitability ratios are used to assess a company's ability to generate revenue and shows how well a company will return equity (Kenton, Profitability Ratios Definition, 2020). The following are the most popular profitability ratios: gross profit margin, operating profit margin, net profit margin, return on assets, and return on equity. All of these ratios are different profitability ratios. The higher these ratios are, the higher the profits may be of the company.

$$\text{Gross Profit Margin: } \frac{\text{Gross Profit}}{\text{Sales}} \quad (1)$$

$$\text{Operating Profit Margin: } \frac{\text{Operating Profit}}{\text{Sales}} \quad (2)$$

$$\text{Net Profit Margin: } \frac{\text{Net Income}}{\text{Sales}} \quad (3)$$

$$\text{Return on Assets: } \frac{\text{Net Income}}{\text{Assets}} \quad (4)$$

$$\text{Return on Equity: } \frac{\text{Net Income}}{\text{Shareholder Equity}} \quad (5)$$

$$\text{Risk vs Reward Ratio: } \frac{(\text{current price} - \text{lowest price})}{(\text{highest price} - \text{current price})} \quad (6)$$

On the other hand of fundamental analysis is qualitative fundamentals. Qualitative fundamentals consist of business model, competitive advantage, management, and corporate governance. Business model refers to what is making the company money. This can seem deceptively simple; however, some companies may be making their revenue in different ways such as royalties or franchise fees. Competitive advantage is simply what a company has that is better than the competitors. For example, AMD has a competitive advantage in computer chip design over Intel. This means that more AMD chips will be sold than Intel and will continue to do so as long as AMD holds a competitive advantage. In this project, we'll be focusing mainly on business model and competitive advantage that companies may hold in their industry.

2.2.2 Technical Analysis

Unlike fundamental analysis that focuses on a company's background, return, and profits, technical analysis focuses on trading data. This can range from volume movement, price movement, futures, and historical patterns/trends. Technical analysis is much more prevalent in short term trades, as volume and price movements cannot be judged over long periods of times and historical patterns can only stay relevant for so long. When speaking of historical patterns in technical analysis, this data is typically from the past two to three years, unless a stock has not moved drastically within that time period. When using technical analysis, there are two major assumptions that are made. The first assumption is that "markets are efficient with values representing factors that influence a security's price," and second, "even random market price

movements appear to move in identifiable patterns and trends that tend to repeat over time.” (Hayes, Technical Analysis, 2020). These two assumptions show that technical analysis is all about identifying trends within a stock’s life.

In technical analysis, indicators are used, much like the ones discussed in the technical trading section. The following indicators are commonly used for technical analysis: price trends, moving averages, support and resistance lines, volume and momentum, and oscillators. Volume and momentum refer to how much and how fast a stock is trading. An oscillator is an indicator that takes the highest and lowest values of a stock within a set time period and builds a trend that oscillates between these two bounds. When the value of the stock approaches either bound, the stock is seen to be overbought or oversold, depending on if it is at the upper or lower bound. In this project, we will be using moving averages, support and resistance lines, and volume and momentum indicators while technical trading.

2.3 Simulation Engines

There are many stock trading and stock market simulation platforms. The one we will be using within this study is Thinkorswim, from TD Ameritrade. Because we are new to trading stocks in a technical aspect, we will be using a simulation program. This allows us to learn from our mistakes, without taking the risk of losing money. The reason we are using Thinkorswim in particular is because it uses the same exact program with the simulation and actual trading. By logging in and toggling between ‘live trading’ and ‘paper money,’ the user can swap between real trading and simulated trading, all within the same platform. Thankfully, most features are the same between the two, so someone can easily practice trading within the paper money and transition easily into live trading. With this simulation account, we will be starting with a balance of \$100,000.

3 Technical Trading

In this section, we will be recording our process and analysis through technical trading. Because we are currently in a pandemic and are about to hit a phase 2 wave of COVID-19 cases, we will be choosing companies in the same fields, so that we can closely compare results without too much of a difference. We'll be sticking with one technology and one consumer directory for our industries. We'll be using RSI, range trading, and MACD, which were all previously explained in section 2.1.1.

3.1 Companies Chosen

For our technology company, we will be choosing Microsoft and for our consumer directory, we will be choosing Netflix. Microsoft is a great company to look into, as with a pandemic, there are increased needs for their products, such as their Microsoft Suite.

Microsoft was founded by Bill Gates, one of the richest men to date, in 1975. Microsoft is a company that licenses and sells technology. They license software, mainly their Office Microsoft Suite, Windows Operating Systems, and other business and server related software. On the other hand, Microsoft also sells hardware, such as their Xbox line up and Windows laptops/tablets. Microsoft first went public in 1986, starting at \$21.00 per share.

As of 7/13/20, Microsoft is at \$214.48 pre-market. On their last quarterly report, on 4/29/20, they had a revenue of \$35 billion, a 15% increase from their last quarter. Their net income was \$10.8 billion, a 22% increase from their last quarter. Overall, it can be said that the effects of COVID-19 have had a minimal impact on Microsoft, as they have been able to expand their cloud computing and personal computing business to many companies as business and jobs moved to being remote. In Figure 3.1, we can see Microsoft stock growth over the past 5 years.



Figure 3-1: Microsoft stock trend over 5 years (July 2015 - July 2020) from MarketWatch

Over the past 5 years, Microsoft has had a 54.94% growth, starting at \$138.43 in July of 2015.

Netflix was founded by Reed Hasting and Marc Randolph in 1997. It was founded to compete with the major movie rental company, Blockbuster. The co-founders of Netflix disliked the late fees of Blockbuster and decided to create a competing brand that also worked with DVDs. Over the next few decades, Netflix evolved into the full online streaming platform, home to over 14,000 titles as of April 2020. Netflix first went public on May 23, 2002, starting at \$15.00 per share.

As of 7/13/20, Netflix is at \$568.52 pre-market. On their last quarterly report, they had a revenue of \$6.15 billion, a 6.6% increase from their last quarter. Their net income was \$720 million, a 1.55% increase from their last quarter. Over the past quarter, they have added 10 million monthly subscribers, and in the first quarter of 2020, they added 16 million monthly subscribers, the most they have ever seen in a single quarter. In Figure 3.2, we can see Netflix stock growth over the past 5 years. Over the past 5 years, Netflix has had a 397.35% growth, starting at \$114.31 in July of 2015.



Figure 3-2: Netflix stock trend over 5 years (July 2015 - July 2020) from MarketWatch.

3.2 Simulation

Within this section, we'll be going over the weekly investment actions that were made while investing within Microsoft and Netflix. We started with 100 shares of both Microsoft and Netflix and have been buying and selling through technical trading techniques.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
							\$100000.00	
7/13/2020	MSFT	Buy	\$214.48	100	\$21448.00	0	\$78552.00	0
7/13/2020	NFLX	Buy	\$568.52	100	\$56852.00	0	\$21700.00	0

Table 3-1: Pre-Week 1 Buys for Technical Trading Method

3.2.1 Week 1

Over the first week, we saw large dips within the market. Within Figure 3.3, we can observe our MACD (blue) and MACD signal (red) for Microsoft crossing. When the MACD crosses over the MACD signal, it is a sign to buy, while when the MACD crosses under the MACD signal, it is a sign to sell. In Netflix, we did not see as much crossing, except for some steep sell offs on the 14th and 17th. The MACD steadily stayed close the signal line as we can see in Figure 3.4.



Figure 3-3: Microsoft stock trend over Week 1 (7/13 - 7/17) from MarketWatch



Figure 3-4: Netflix stock trend over Week 1 (7/13 - 7/17) from MarketWatch

On the 16th, I purchased 20 shares of Microsoft at \$203.84 after seeing our MACD crossing above our signal line. Also, our MACD was on a steady increase, moving from negative to positive, which was a good signal. On the 17th I decided to buy 10 shares of Netflix at \$490.26. At this point, I had seen our MACD line crossing over the signal line after a deep sell off and had thought that the stock would rebound. These purchases can be seen within Table 3.2.

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
7/16/2020	MSFT	Buy	\$203.84	10	\$2038.40	0	\$78552.00	0
7/17/2020	NFLX	Buy	\$490.26	10	\$4902.60	0	\$21700.00	0

Table 3-2: Week 1 Buys/Sells for Technical Trading Method

For my plans for the next week, I am looking towards selling shares within Netflix to purchase more in Microsoft. Overall, when we look at the MACD, we see that the range is between 0 and -2.5 for Microsoft in Figure 3.3, while the MACD range is 0 to -20 for Netflix, showing there is much more negative volatility within Netflix in Figure 3.4. It will be safer to invest in Microsoft over Netflix. We will however keep shares in Netflix because its MACD has averaged back to 0, a positive sign for future earnings.

Although it is not part of technical trading, during this week, both Netflix and Microsoft released their earnings reports for Q2 of 2020. Microsoft had an EPS of \$1.46, beating analysts by \$0.12, while Netflix had an EPS of \$1.59, \$0.22 under analyst predictions. This can explain the steep sell offs that Netflix had on the 17th.

3.2.2 Week 2

In week 2, we saw some interesting things happen. When viewing Microsoft we saw some steep sell offs during the end of the week. I noticed that over time from week 1, a heavy negative MACD with large volume are great signs to buy in a stock. This is why during this week, I decided to buy Microsoft and Netflix when their MACDs were heavily negative and sold when they had reached positives. I didn't feel comfortable holding onto these stocks for too long, so I sold them quickly, making a quick profit. As can be seen in Figure 3.5, The MACD of Microsoft was very high in the beginning of the week. I took this as a sign to sell shares of Microsoft, predicting a decline in the future. On the 21st of July, I sold 30 shares of Microsoft at \$211.92 as the MACD was having a downwards trend back towards 0. This netted me a profit of \$29.60 for technical trading. Although not much, we have to consider the fact that our starting point was very much at the peak of Microsoft stock.

On the 23rd, I decided to buy more shares of Microsoft at a lower price point of \$202.70. I saw this as a good opportunity to buy in as it was much lower than my previous selling price of \$211.92, and the MACD had been negative for the entire day. I didn't see the MACD going even lower than what it currently was and wanted to buy low.

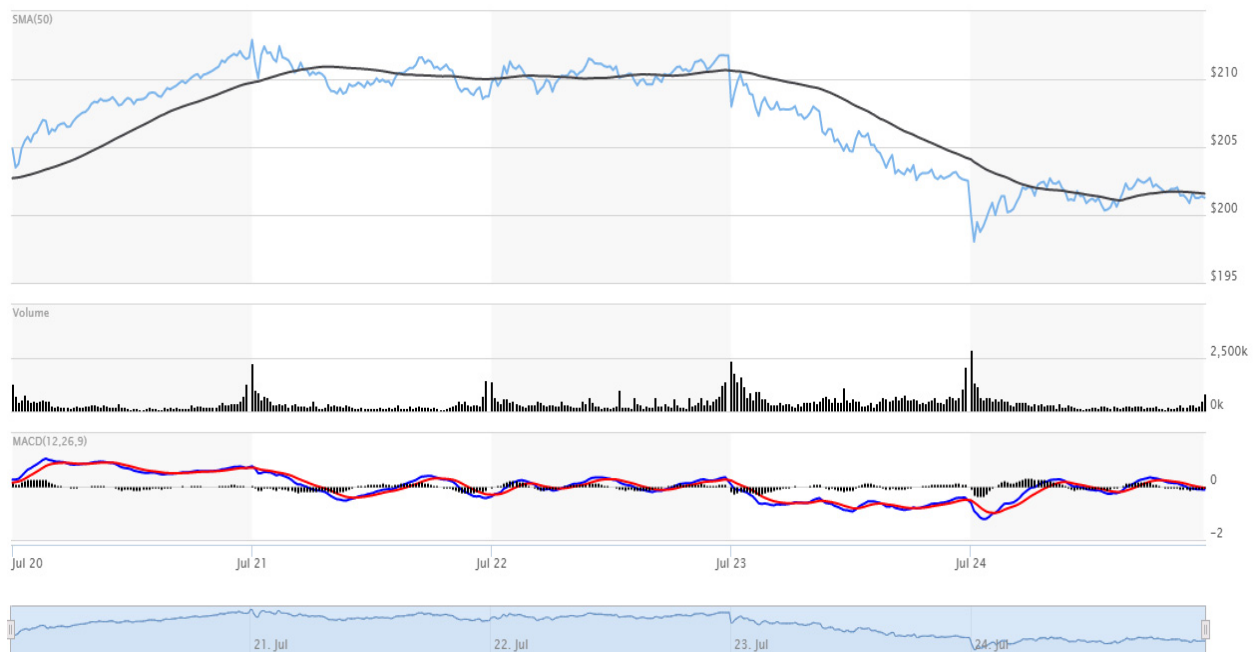


Figure 3-5: Microsoft stock trend over Week 2 (7/20 - 7/24) from MarketWatch

As for Netflix. I decided to do as I had said last week. I decided to sell shares of the stock as the MACD was heavily negative over the past few days. On the 22nd, I decided to sell 50 shares of Netflix at \$492.76 in an attempt to recoup the heavy losses I had gone through so far already from Netflix. This prediction was correct, as we can see in Figure 3.6, Netflix continued to fall. This was probably due to the negative report from the earning call that Netflix had last week. The EPS under analysts' expectations definitely had a big hit on the company, even though Netflix had reported the under evaluation before the earnings call.

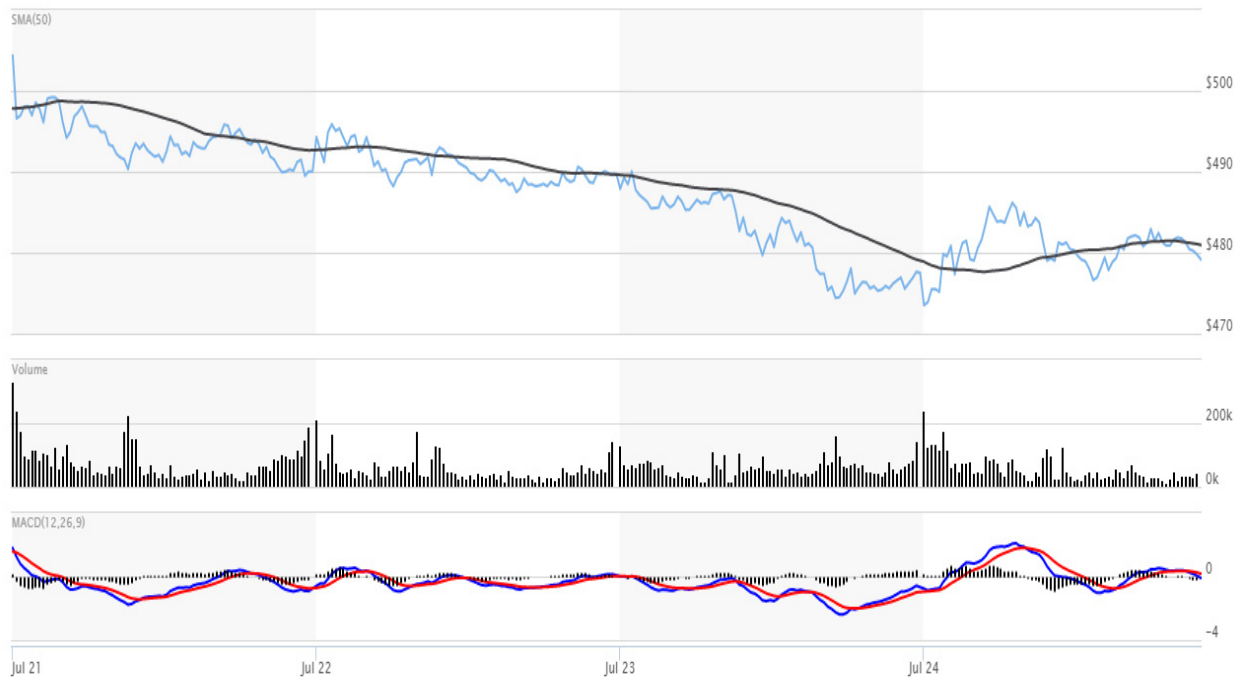


Figure 3-6: Netflix stock trend over Week 2 (7/20 - 7/24) from MarketWatch

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
7/21/2020	MSFT	Sell	\$211.92	30	\$6357.60	\$29.60	\$28057.00	+\$29.60
7/22/2020	NFLX	Sell	\$492.76	50	\$24638.00	\$3788.00	52695.00	-\$3758.40
7/23/2020	MSFT	Buy	\$202.70	50	\$10135.00	0	\$42560.00	-\$3758.40

Table 3-3: 3.3 Week 2 Buys/Sells for Technical Trading Method

3.2.3 Week 3

During week 3, we were able to observe an interesting pattern that I was able to capitalize on. As we see in Figure 3.7, for Microsoft, there were heavy sell offs during the end of the day/beginning of the day, with a steady increase of buying throughout the day. This pattern was reinforced by the short term MACD chart that can be seen in Figure 3.7. Following this trend, I bought 50 shares of Microsoft July 28 at \$202.17 during the end of the day as the MACD and prices were falling. This was also a great buy because it was lower than the last price in which I bought Microsoft at \$202.70. The next morning, I saw a rise in the MACD, a good opportunity to sell the shares as we saw a great buy in of the stock in the morning. Knowing volume peaks during the morning and evening, this seemed to be a perfect profit. I sold 100 shares of Microsoft at \$204.01 during the morning of July 29, making a profit of \$157.50. Also, during this time, rumors of Microsoft buying the multi-billion-dollar industry of Tiktok came to light. With this information, I predicted that the stock would be going up as Tiktok would be a huge opportunity for Microsoft. I decided to buy more shares at a lower cost and keep them until more news came out. On July 30, I bought 200 shares of Microsoft at \$200.21, I observed another dip in Microsoft on July 31, as trading in the morning, the stock dipped below \$200. Taking advantage of this, I bought another 50 shares of Microsoft at \$199.78. Also, I observed the short term MACD chart being deeply in the negative. As we discovered in week 2, a negative dip in a short term MACD chart is a great indicator that the market is looking upwards in the near future. It is good to keep in mind that the short term MACD may be negative, but overall, Microsoft MACD is well above 0 constantly, showing that it is a great buy overall, but in short term markets that we are dealing with, the signs of a long term and short term MACD may be seen as counter intuitive.

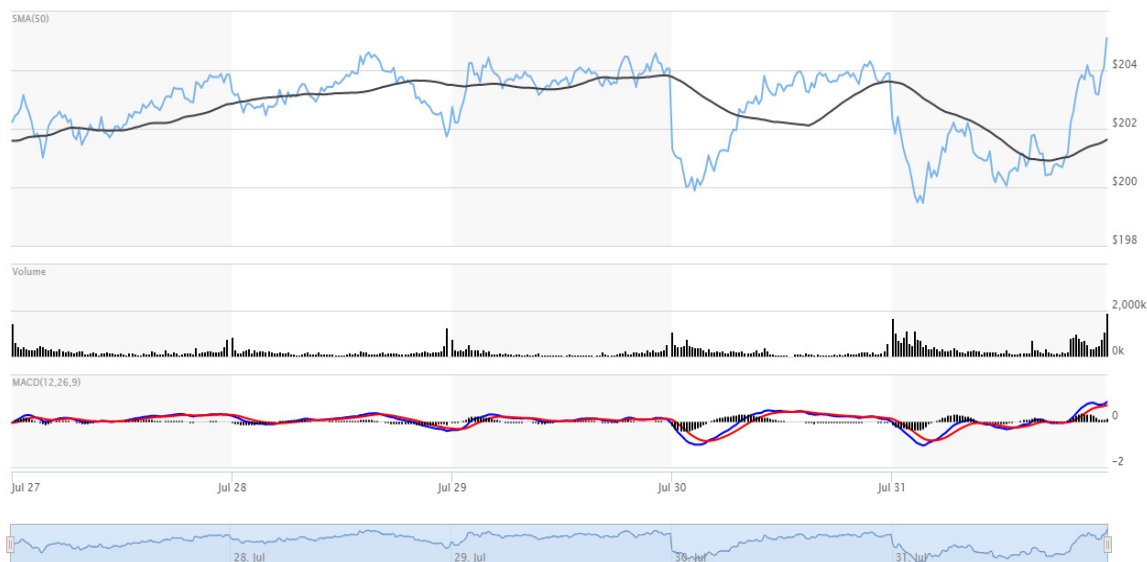


Figure 3-7: Microsoft stock trend over Week 3 (7/27 - 7/31) from MarketWatch

As for Netflix, I missed my opportunity to sell my shares during the beginning part of the week where the MACD was high as can be seen in Figure 3.8, as I was more involved with other stocks. However, I will be holding on to Netflix for this week. This is because Netflix is scheduled to release news on new shows and movies it will be releasing for the coming weeks, an indicator for whether Netflix will be going up or down in the near future.



Figure 3-8: Netflix stock trend over Week 3 (7/27 - 7/31) from MarketWatch

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
7/28/2020	MSFT	Buy	\$202.17	50	\$10,108.50	\$0.00	\$32,451.50	-\$3,758.40
7/29/2020	MSFT	Sell	\$204.01	100	\$20,401.00	\$157.50	\$52,852.50	-\$3,600.90
7/30/2020	MSFT	Buy	\$200.21	200	\$40,042.00	\$0.00	\$12,810.50	-\$3,600.90
7/31/2020	MSFT	Buy	\$199.78	50	\$9,989.00	\$0.00	\$2,821.50	-\$3,600.90

Table 3-4: Week 3 Buys/Sells for Technical Trading Method

3.2.4 Week 4

During our final week of trading, I looked to selling the rest of my shares for the best profits. I did see one great opportunity to buy more Microsoft shares as there was a large dip in the MACD as can be seen on August 4. However, this is due to a large volume increase over the past weekend as talks of purchasing Tiktok increased over the weekend and the rumors were confirmed on Sunday, 8/2/20. On Monday, Microsoft increased from \$205.01 to \$216.54. I decided this was a great time to exit the market with my remaining shares from the previous week. To reduce risk, I decided to sell the rest of my shares during this increase in price, as talks of buying Tiktok were scheduled to be finished by September, meaning nothing was guaranteed in the price of Microsoft. I sold my 330 shares of Microsoft at \$215.49. Giving me a large return on my investment and making up for the money I had lost in this account from the Netflix earnings in Week 2. As can be seen in figure 3.9, Microsoft did have a large peak on August 6, however, sometimes, it is best to get out while you can. I exited at an entry price of \$215.49, well above my average purchase price. Even though I am a dollar below the average price on the 7th, the purpose of this project was to be

able to know when to exit a market as well, learning patterns in the fluctuation of a company based off of MACD and market news.

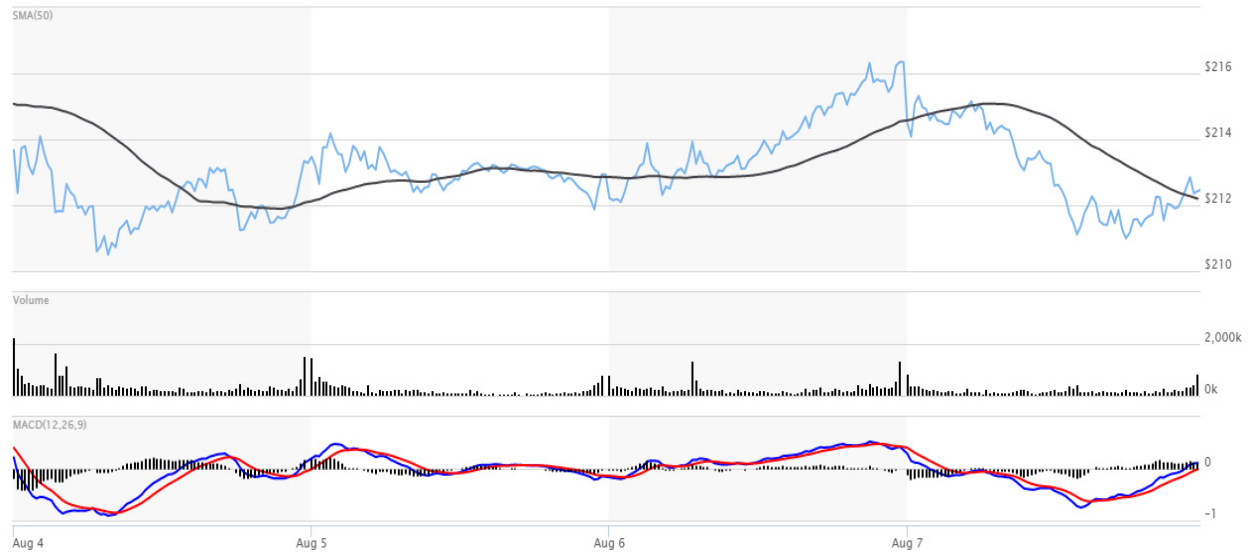


Figure 3-9: Microsoft Stock trend over Week 4 (8/3 - 8/7) from MarketWatch

As for Netflix, we saw a steady line during week 4, with a steep sell off at the end of the week, due to news that some shows and movies would be delayed due to COVID-19. Although a smart move by Netflix to protect its employees, it took a \$20 hit on the stock price. Thankfully, with such a peaked MACD on the 4th of August, as can be seen in Figure 3.10, I sold my remaining shares at \$509.81. Although we did not come out anywhere near our initial purchase price at \$568.52, we were able to cover our losses with the gains in Microsoft.

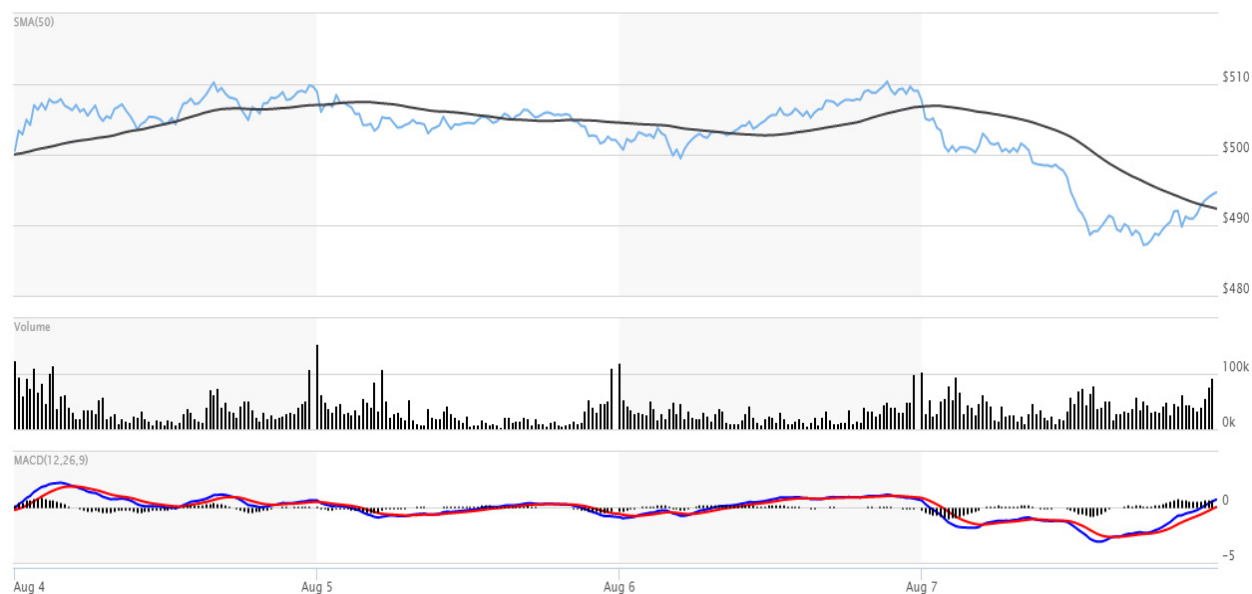


Figure 3-10: Netflix Stock trend over Week 4 (8/3 - 8/7) from MarketWatch:

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
8/3/2020	MSFT	Sell	\$215.49	330	\$71,111.70	\$10128.90	\$73,933.20	6528.00
8/4/2020	NFLX	Sell	\$509.81	60	\$30,588.60	-\$2740.00	\$104,521.80	\$4521.80

Table 3-5: Week 4 Buys/Sells for Technical Trading Method

3.3 Results

Overall, we were able to net a profit of \$4521.80, after being considerably down during week 2. At the lowest point during week 2, the account total was asset was more than \$10,000 under the starting \$100,000. I was originally discouraged by this huge set back. The current market is quite volatile due to the pandemic, and this has made the market quite unpredictable since March. The greatest take away from the technical trading was to view the MACD of a stock. By comparing the short term and long term MACD, a trader can observe simple patterns within a stock. By also observing that markets are most volatile during the peak initial and last hour of the market, a lot

of my time was spent observing these times and looking for large volatility. During these peak hours and premarket, observing deep negative MACD was typically preceded by a large buy in at the lower price and vice versa. This MACD does need to be compared at different chart ranges of 1 day, to 5 days, to 1 month, and larger ranges to view the overall trends of a stock. Using this technique, I was able to net a profit from Microsoft and cover my heavy losses from Netflix with an overall net profit in the entire account of 4521.80, a 4.52% increase in the overall portfolio to the account. Considering the large setback within the first two weeks, I think this profit over a short period of time of 4 weeks was a great result.

4 Swing Trading

In this section, we will be recording our process and analysis through swing trading. We will again be choosing companies within the technology and consumer directory industries to easily be able to compare companies that should overall be affected by the same things. We'll be using the concepts within fundamental analysis while swing trading.

4.1 Companies Chosen

For our technology company, we will be choosing Apple and for our consumer directory, we will be choosing Disney. Apple is a company that had been hit hard with the initial pandemic in March 2020. However, they have done well throughout the second quarter and into the third quarter of the year. With people stuck inside, consumers are flocking towards technology companies for something to do. Disney on the other hand is on a resurgence with a similar idea in mind. With people at home, Disney Plus is gaining traction, just like it's competitor Netflix.

Apple was founded by Steve Jobs, Steve Wozniak, and Ronald Wayne in 1976 as a computer company. Throughout the years, they have developed a niche department of elitist technology, boasting the great technology at an expensive price. Their products range from phones, tablets, laptops, and computers. Overall, they have a loyal consumer base that will always buy their consumer technology. Apple first went public in 1980 at \$22.00 per share.

As of 7/13/20, Apple is at \$390.40 pre-market. On their last quarterly report, they had a revenue of \$58.3 billion, a 36.49% decrease from their last quarter. Their net income was \$22.2 billion a 40.09% decrease from their last quarter. With the introduction of COVID-19 pandemic, the sales of Apple have fluctuated greatly, however, the company has rebounded. Although there were drastic sell offs during the initial wave of the pandemic, an increase of online workflow has

required the increased purchase of consumer technology such as MacBook. Apple has also seen a great increase in the App Store sales, increased by 23% compared to 2019. In Figure 4.1, we can see Apple stock growth over the past 5 years. Over the past 5 years, Apple has had a 221.85% growth, starting at \$121.30 in July of 2015.



Figure 4-1: Apple stock trend over 5 years (July 2015 - July 2020) from MarketWatch

Disney in comparison is a much older company. Disney was founded in 1923 by Walt and Roy Disney. From its inception, it was an entertainment company. Disney has produced multiple films such as The Lion King and Mulan and have created large amusement parks such as Disney World and Disney Land. Disney first went public in 1956 at \$13.88 per share.

As of 7/13/20, Disney is at \$119.19 pre-market. On their last quarterly report, they had a revenue of \$18.01 billion, a 13.66% decrease from the previous quarter. Their net income was \$475 million, a 77.38% decrease from the previous quarter. These numbers are quite drastic, and it is obvious that the pandemic has had a large impact on the company. However, the company is gaining traction for the next quarter, as their online streaming has gained large traction with Disney Plus, Hulu, and online sports streaming has gained huge subscriptions. Between March 28, 2020 and May 4, 2020, Disney Plus gained 21 million subscribers, totaling 54.5 million subscribers as of May 4th. This number is only to have increased over the past two months, as the pandemic has continued to keep people at home. In Figure 4.2, we can see Disney stock growth over the past 5

years. Over the past 5 years, Disney has actually decreased 1.13%, however, I believe is looking to rebound within the coming years as restrictions on quarantining are lifted.

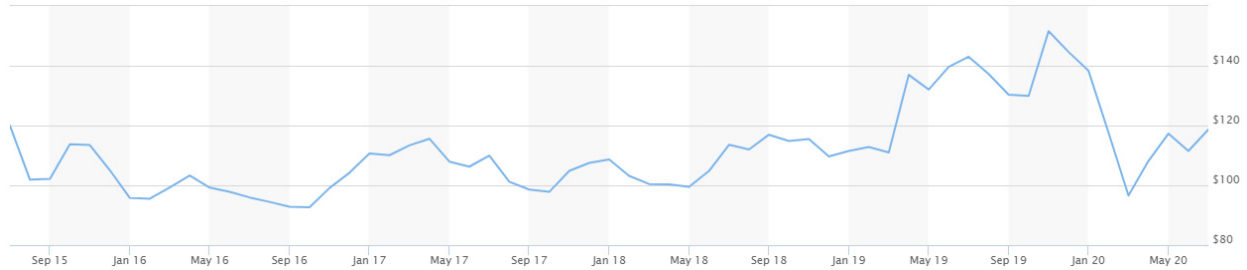


Figure 4-2: Disney stock trend over 5 years (July 2015 - July 2020) from MarketWatch.

4.2 Simulation

Within this section, we will be going over the weekly investment actions that were made while investing within Apple and Disney. We started with 100 shares of both Apple and Disney and have been buying and selling through swing trading techniques. This can be seen in table 4.1

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
							\$100000.00	
7/13/2020	AAPL	Buy	\$390.40	100	\$39040.00	0	\$60960.00	0
7/13/2020	DIS	Buy	\$119.19	100	\$11919.00	0	\$49041.00	0

Table 4-1: Pre-Week 1 Buys for Swing Trading Method

For swing trading, we have a lot more cash to work with, so we will be looking to buy shares.

4.2.1 Week 1

Overall, we can see a fall trend in both Apple and Disney. This can be seen by our risk over reward ratios. Our lowest point is at \$376.15 on July 14 around 10 AM. Our highest point occurs on July 15 around 9:30 AM at \$396.21. Our risk to reward ratio would be as show in Equation 7:

$$\frac{(X-376.15)}{(396.21-X)} < 1.0 \quad (7)$$

Giving us a risk to reward ratio of 0.949. This is a sign that we should not buy any Apple stock on this upward trend between July 14 and 15. I decided to not purchase any Apple shares throughout the week, as we were on a constant downward trend. Even though our risk to reward ratio was close to 1.0, we did well by not buying more shares, as there was a huge sell off July 15 morning. This can clearly be seen in Figure 4.3, where the small upward trend was immediately met with large sell offs. Observing the past 3 months of Apple stock, we can see that there is a large resistance to the \$390-400 range. Apple struggles to break past the barrier and therefore they see large sell offs when the stock reaches that price range.



Figure 4-3: Apple stock trend over Week 1 (7/13 - 7/17) from MarketWatch

For Disney, I observed that there was a huge influx of volume in the morning of July 14. Observing the previous day sell offs, I bought 50 shares of Disney at \$115.46. Observing that the previous day hadn't sold off a lot at the end of the day, I decided to sell 20 shares of Disney at \$121.27, making a small profit. I wasn't able to do a risk to reward ratio for Disney, as there was no consistent upward or downward trend for me to follow. The volatility of the stock confused me, so I decided to hold for the rest of the week and observe until the next week before making some more trades.

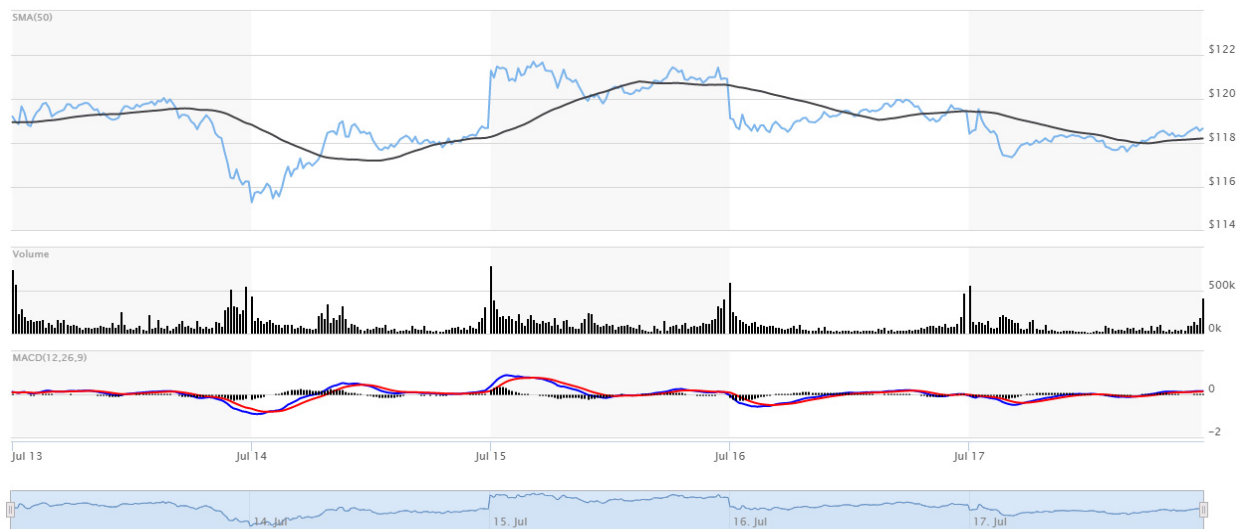


Figure 4-4: Disney stock trend over Week 1 (7/13 - 7/17) from MarketWatch

At the end of week 1, for swing trading, we have a \$208 profit from selling 100 shares of Disney as can be seen in Table 4.2. I decided to sell these shares, as it was above my initial buy price of \$119.19. Observing a one month or three-month timeline, we can see a steady increase of Disney starting after June 25th, however, observe a hard-peak resistance at \$127.28, so we will be looking for trendlines moving towards that value in the coming weeks.

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
7/14/2020	DIS	Buy	\$115.46	50	\$5773.00	0	\$43268.00	0
7/15/2020	DIS	Sell	\$121.27	100	\$12127.00	\$208.00	\$55395.00	\$208.00

Table 4-2: Week 1 Buys/Sells for Swing Trading Method

4.2.2 Week 2

Observing Apple in week 2, we saw some deep sell offs leading up to July 24th, similar to what we saw in Microsoft in technical trading. Overall, throughout the beginning of the week, there was an even plateau. However, I found a downward trend later into the week on July 23rd. Observing a 3-month period, in Figure 4.5, there is a hard bounding line. Following this line, I knew that the stock would not dip below a range of \$350 to \$365 from the bounding line in the past month or so. Because of this, I bought 100 shares of Apple on July 23rd for \$363.05. This was a great price for me because it was roughly \$30 under my original price, giving me a large margin for profit when selling these stocks later on. As we can see in Figure 4.6, there was a hard falling line that hit the resistant bounding line on July 24th.

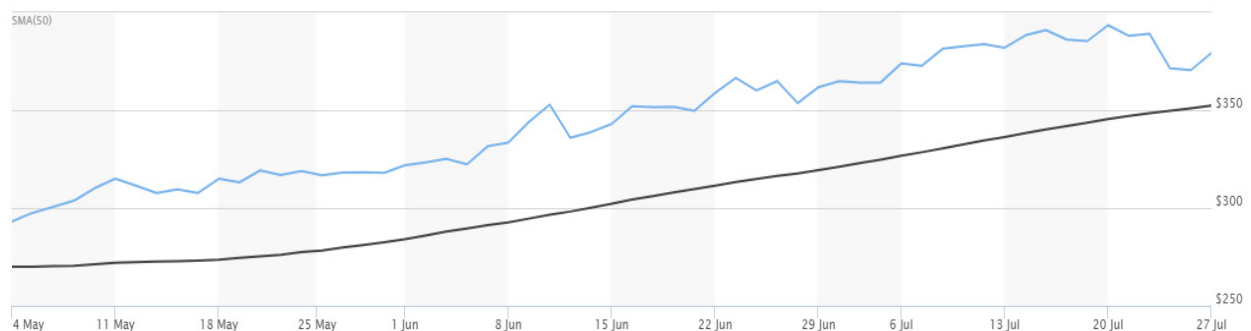


Figure 4-5: Apple stock trend over past 3 months (May 2020 to July 2020) from MarketWatch



Figure 4-6: Apple stock trend over Week 2 (7/20 - 7/24) from MarketWatch

As for Disney, in Figure 4.7, we see some high fluctuation of the stock. Observing an opportunity to make a quick profit, I sold my remaining 50 shares of Disney at \$120.03 on the 21st. The risk to reward ratio was very low, and it was not looking like a safe stock to trade at the moment, as many reports were coming in that people were getting sick at the Disney parks during this time. I am probably going to hold off on trading Disney, as much bad news has been circulating around the company, and it does not look good for the near future. We will probably be trading more Apple stock next week than Disney.



Figure 4-7: Disney stock trend over Week 2 (7/20 - 7/24) from MarketWatch

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
7/21/2020	DIS	Sell	\$120.03	50	\$6001.50	\$42.00	\$61396.50	\$250.00
7/23/2020	AAPL	Buy	\$363.05	100	\$36305.00	0	\$25091.50	\$250.00

Table 4-3: Week 2 Buys/Sells for Swing Trading Method

4.2.3 Week 3

For week 3, we will start off with Apple, having a quiet trading week until earnings came out after hours on the 30th. I decided to buy shares of Apple in hopes for a positive earnings report at the end of the week. I bought an additional 50 shares on July 28 at \$376.96. I was not expecting positive news in Disney during their earning report the following week, as much of their revenue source from parks have been since closed down, a huge hit on the company. Because of this, I decided to do a full Apple pivot, moving all assets to Apple and selling off the rest of my Disney stocks, as they were not looking promising. Even though Disney+ has been gaining heavy traffic

over the pandemic, I do not believe it to be a sustainable source of profit to keep the company afloat while their parks are getting shut down. As can be seen in Figure 4.9, the constant volume at which Disney is being traded is astronomical as people place their bets on whether Disney will beat the EPS of $-\$0.64$. Due to these, I sold my remaining 100 shares of Disney on July 28th at \$116.19.

With the funds that I got from selling Disney, I bought an additional 45 shares of Apple on July 30th at \$383.19. On the 30th, Apple reported earnings per share of \$2.58, beating the estimate of \$2.04. This is around a 20% difference from the EPS, something that is normally within a 5 to 10% margin. Because of this huge upset, the stock shot up after market July 30 and 31. I could have sold my shares at this point in time, but I decided to hold the shares until next week, letting the profit grow more as more people begin to invest in Apple after the earnings. Also, Apple announced a 4 to 1 stock split, meaning the price will be divided by 4 at the end of August. Technically, this does not mean anything, as stocks can typically be bought at fractions. However, to analyst, a stock split shows wealth growth in a company, as investors will have an easier time purchasing the stock at the lower cost, making it more affordable for all.

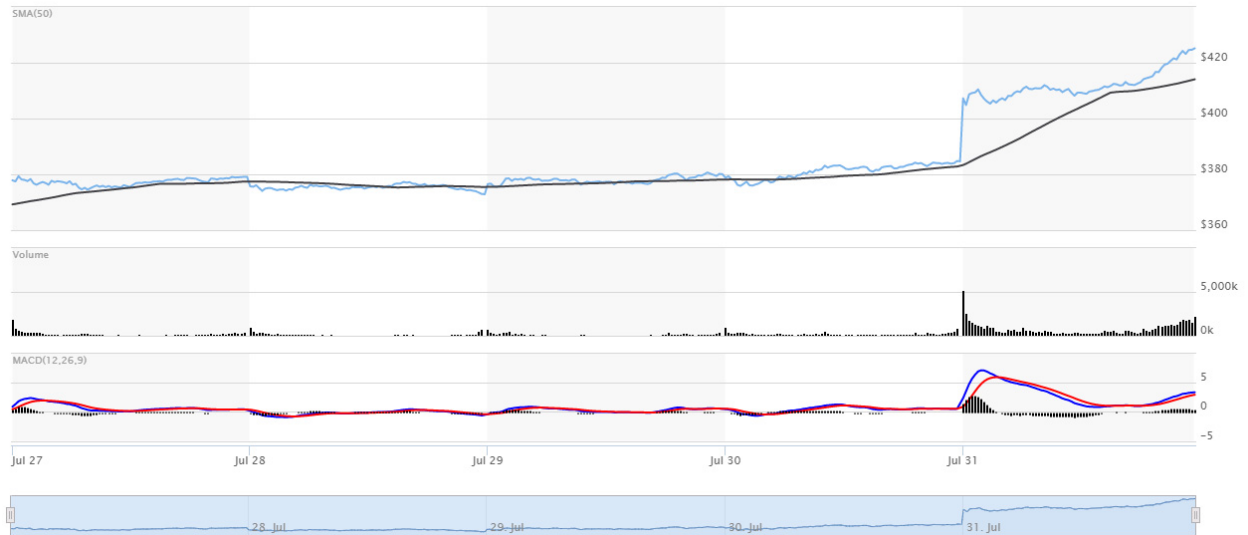


Figure 4-8: Apple Stock trend over Week 3 (7/27 - 7/31) from MarketWatch



Figure 4-9: Disney Stock trend over Week 3 (7/27 - 7/31) from MarketWatch

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
7/28/2020	AAPL	buy	\$376.96	50	\$18,848.00	\$0.00	\$6,243.50	\$250.00
7/28/2020	DIS	sell	\$116.19	100	\$11,619.00	-\$300.00	\$17,862.50	-\$50.00
7/30/2020	AAPL	buy	383.19	45	\$17,243.55	\$0.00	\$618.95	-\$50.00

Table 4-4: Week 3 Buys/Sells for Swing Trading Method

4.2.4 Week 4

The final week for swing trading was quite uneventful. I looked for a good exit point for the 295 Apple shares I had amassed over the 4 weeks. I had no plans to invest in Disney, as earnings were coming up and it was a volatile and inconsistent time to invest in the company. I waited until the end of August 6 to sell my 295 shares at \$451.10. The reason I exited at this point was because I viewed the MACD, seeing a peak that was on its way down during the 1-day period. In Figure 4.10, we can see that the MACD peaks and goes down at the end of the 6th, slumping down to the negative. Selling at a high MACD gave me the best swing on this trade, netting a large profit. Unfortunately, for Disney, they resulted in an eight cent EPS, when the estimated EPS was -64 cents. Investors were heavily predicted tumbling shares after parks were closed and the main source of revenue being their online platform Disney+. The reason they may still be afloat is because Disney+ now contains Hulu and ESPN and a variety of other shows, one of the largest selections to be had at the price of one subscription. I predict however this earning will be short lived, just like Netflix. As we saw, Netflix has a fall in their shares due to poor performance because much of their new subscribers came during March to May. Disney's recent addition of Hulu and ESPN to their subscription may have warranted a mass of subscribers looking for new

content, but this will not be long held in my opinion as subscribers finish watching shows and unsubscribing.

As can be see in Figure 4.11, shares skyrocketed after the positive EPS that Disney had. A profit that could have been made if I had not prematurely sold my shares of Disney as a safety net, but my profits from Apple more than compensate.

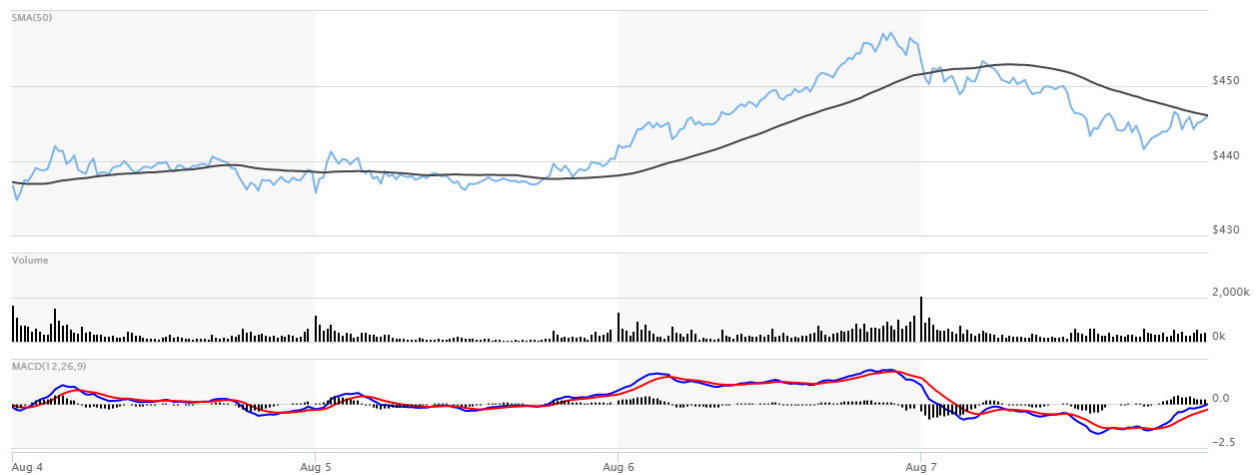


Figure 4-10: Apple Stock trend over Week 4 (8/3 - 8/7) from MarketWatch

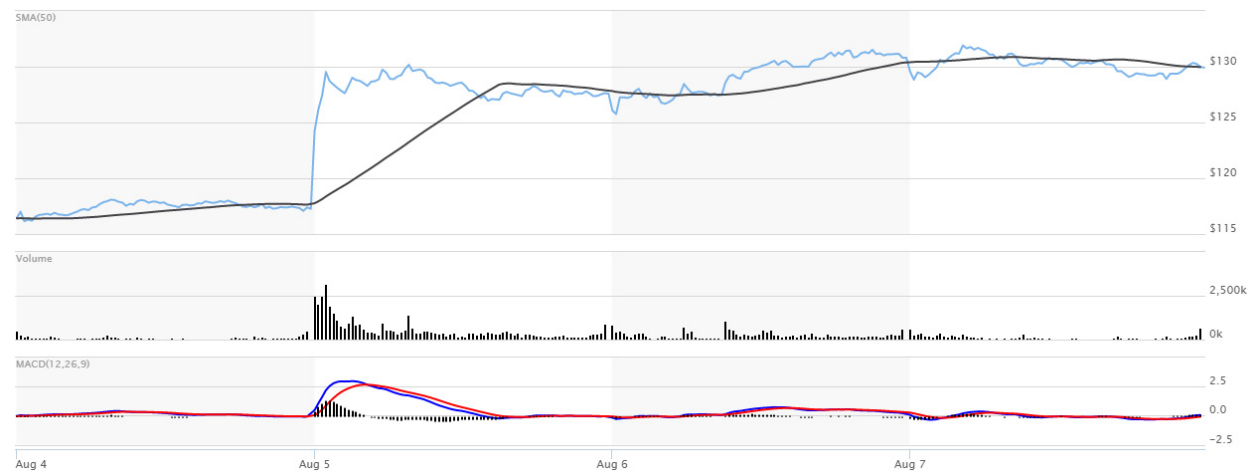


Figure 4-11: Disney Stock trend over Week 4 (8/3 - 8/7) from MarketWatch

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
8/6/2020	AAPL	sell	\$451.10	295	\$133074.50	\$21637.95	\$133693.45	\$33693.45

Table 4-5: Week 4 Buys/Sells for Swing Trading Method

4.3 Results

Overall, we ended with a net profit of \$33,693.45 from the swing trading method. The main concept that was used was to buy and sell through the news. Knowing what sort of news could affect the stock greatly increased my ability to decisively choose whether or not to invest in a stock. I believe Disney was maybe not the best consumer sided stock to invest in. This is because I had not thought about where a large chunk of their revenue comes from, which are from parks. Even though Disney+ has been doing very well, it does not make up for the huge profits that multiple theme parks can make. I knew however that Apple would be a good investment. This is because no matter what, Apple's well integrated system brings many new users and repeat customers. During this project, even I invested in an iPad to be a tool to assist in my hobby of drawing and for note taking in the future. After using it for a month, I can say that Apple products are well integrated with each other, which makes people more likely to purchase other Apple products so their technology can work like a well-oiled machine together. Although I am a well-versed student in technology and am not engrossed by this sort of integration propaganda, I can easily see the appeal to having everything universal and working in unison. Overall, I think the swing trading technique worked well for me in choosing noteworthy points to buy Apple to save up for their quarter earnings and sell at a great price.

5 Analysis and Comparison

Over the past 4 weeks, we have traded using two main techniques: technical trading and swing trading. In technical trading, we used technical analysis, observing data collected and displayed from stock watching applications. In Thinkorswim, we used the MACD and moving averages to decide whether or not to buy or sell. Observing a negative MACD or a dip on a one-day basis was observed as an overall great sign to buy into a stock, as the stock was to move northwards. On the other hand, if the MACD was positive with a peak on a one day basis, it was a great sign to sell, as the stock had come to some sort of peak and would be dropping off soon. Over a 5 day or 10 day period however, the MACD is read differently, where the trader should look for the opposite, in which they should buy during the rise from a zero, and sell during the dip from a zero. Over the past four weeks, we netted a positive growth of 4.52%.

On the other hand, we also observed and traded using swing trading methods. With the swing trading method, we looked deeper into the values of the company, and mostly traded the news that was presented to us during our four-week journey. Over the past four weeks, we had much news in the two companies we traded: Apple and Disney. With Apple, we saw a dip in the first two weeks, recovering past our starting point with great success from their Q2 earnings. In the final days of writing this report however, Apple has had lawsuit with popular Epic Games over the restrictions of allowing in app purchases that bypass the Apple App Store, therefore not giving the 10-30% fee that is given to the App Store just for being on an Apple device. This has brought up much debate as Epic Games has claimed this is a fight for the freedom to decide where and how we spend our money. Disney on the other hand had a rough ride, as up to 70% of their revenue is from their parks being open. However, with the recent pandemic, their parks have been closed. Recently, they have been open, but there has been huge backlash, as tourists were flocking into

parks with a lack of regard for safety, with people reported being sick. The combination of this news has made Disney dip a significant amount over the four-week trading period, making it a difficult stock to make a profit off of. Over the four-week period, we did net a 33.7% profit, this mainly coming from swing trading Apple stocks. This was very beneficial when we traded the earning report news, where Apple had an EPS of \$2.58, roughly 20% above what was expected at \$2.04. Also, recent news of Apple having a 1 to 4 stock split has increased trading volume.

Overall, trading using technical analysis can be profitable with most stocks. Being able to read candlestick charts and knowing when to invest using the MACD to read dips and peaks makes for a relatively simple trading experience. Of course, there are many other tools that can be used in technical trading that allow for even more in-depth knowledge and read into a stock and its value at a point in time. On the other hand, swing trading happens greatly over news, which cannot be easily predicted. Unless you have inside information, which would make it illegal to trade, it would be impossible to accurately know if a company was going to outperform during an earning report, or if some new product was being released. This is why swing trading can be unreliable. As we saw, Disney had a big low during our trading period, creating large losses for my swing trading account until Apple earning reports were released. On the other hand, Apple had done extremely well and shot up, making me a healthy profit. This is why many traders who swing trade will look at many different companies, hopping between companies through earning reports and trading based off of new products and such.

6 Conclusion

In conclusion, technical analysis trading can be executed on almost any stock reliably. It allows for a consistent result by reading various charts and reading signs from those charts. It may not be the fastest results, but it is consistent and can be used to grab profits over long periods of times with the same strategy without much risk. On the other hand, swing trading is volatile and can be unreliable over long periods of times. It is best used over short periods of times, typically ranging from overnight, to a few days. Overall, I learned about how to read different stock charts, how different news can affect a company, and how to effectively technical and swing trade. I take this project as a success, as I was able to net a profit off of both accounts and learn about key principals when trading.

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Appendix

Table A: Technical Trading Stock Simulation Profile

Date	Symbol	Buy/Sell	Price	Shares	Net Cost	Profit/Loss	Total Cash	Total Profit
							\$100,000.00	
7/13/2020	MSFT	Buy	\$214.48	100	\$21,448.00	\$0.00	\$78,552.00	\$0.00
7/13/2020	NFLX	Buy	\$568.52	100	\$56,852.00	\$0.00	\$21,700.00	\$0.00
7/16/2020	MSFT	Buy	\$203.84	10	\$2,038.40	\$0.00	\$78,552.00	\$0.00
7/17/2020	NFLX	Buy	\$490.26	10	\$4,902.60	\$0.00	\$21,700.00	\$0.00
7/21/2020	MSFT	Sell	\$211.92	30	\$6,357.60	\$29.60	\$28,057.00	\$29.60
7/22/2020	NFLX	Sell	\$492.76	50	\$24,638.00	\$3,788.00	\$52,695.00	-\$3,758.40
7/23/2020	MSFT	Buy	\$202.70	50	\$10,135.00	\$0.00	\$42,560.00	-\$3,758.40
7/28/2020	MSFT	Buy	\$202.17	50	\$10,108.50	\$0.00	\$32,451.50	-\$3,758.40
7/29/2020	MSFT	Sell	\$204.01	100	\$20,401.00	\$157.50	\$52,852.50	-\$3,600.90
7/30/2020	MSFT	Buy	\$200.21	200	\$40,042.00	\$0.00	\$12,810.50	-\$3,600.90
7/31/2020	MSFT	Buy	\$199.78	50	\$9,989.00	\$0.00	\$2,821.50	-\$3,600.90
8/3/2020	MSFT	Sell	\$215.49	330	\$71,111.70	\$10,128.90	\$73,933.20	\$6,528.00
8/4/2020	NFLX	Sell	\$509.81	60	\$30,588.60	-\$2,740.00	\$104,521.80	\$4,521.80

Table B: Swing Trading Stock Simulation Profile

Date	Symbol	Buy/Sell	Price	Shares	Net Cost	Profit/Loss	Total Cash	Total Profit
							\$100,000.00	
7/13/2020	AAPL	Buy	\$390.40	100	\$39,040.00	\$0.00	\$60,960.00	\$0.00
7/13/2020	DIS	Buy	\$119.19	100	\$11,919.00	\$0.00	\$49,041.00	\$0.00
7/14/2020	DIS	Buy	\$115.46	50	\$5,773.00	\$0.00	\$43,268.00	\$0.00
7/15/2020	DIS	Sell	\$121.27	100	\$12,127.00	\$208.00	\$55,395.00	\$208.00
7/21/2020	DIS	Sell	\$120.03	50	\$6,001.50	\$42.00	\$61,396.50	\$250.00
7/23/2020	AAPL	Buy	\$363.05	100	\$36,305.00	\$0.00	\$25,091.50	\$250.00
7/28/2020	AAPL	Buy	\$376.96	50	\$18,848.00	\$0.00	\$6,243.50	\$250.00
7/28/2020	DIS	Sell	\$116.19	100	\$11,619.00	-\$300.00	\$17,862.50	-\$50.00
7/30/2020	AAPL	Buy	\$383.19	45	\$17,243.55	\$0.00	\$618.95	-\$50.00
8/6/2020	AAPL	Sell	\$451.10	295	\$133,074.50	\$21,637.95	\$133,693.45	\$33,693.45