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Stock Market Simulation

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Abstract

In this Interactive Qualifying Project (IQP), a ten-week trading simulation was performed using two different trading styles: fundamental trading and technical trading. Rather than trading stocks, the simulation consisted of buying calls and puts, which are otherwise known as option contracts. With an initial amount of $250,000, each team member used one trading strategy exclusively to purchase options. By the end of the trading simulation, the technical trading style had lost 6.95% of the starting funds while the fundamental trading style made a modest 0.44% profit. As a result of the trading simulation, the team members were able to further expand their understanding and experience with the stock market to build a better foundation for potential future investments.

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1. Introduction

*1.1. Goals and Scop*e

The objective of the Stock Market Simulation IQP is to expand and develop extensive knowledge and understanding of today's stock market through both research and practice with simulation. The intention is to learn, then effectively apply the gathered information to real-world applications. To accomplish these goals, we are going to analyze the history of the stock market and research a multitude of different strategies used to become successful through stock market trading. After familiarizing ourselves with the various strategies for trading, we will research and record 10 companies in which we feel will provide us with the best results in the upcoming simulation. Once our 10-week simulation begins, we will be recording our data and methodology for certain actions. When the simulation is complete, results will be compared among the two strategies to see which generated the greatest profit margin and why.

1.2 Stock Market History

The first official stock exchange began in Antwerp, Belgium 1531. During these times people known as moneylenders would join to discuss business, government, and issues regarding individual debt. This type of exchange slowly evolved as we see locations such as London create their first stock exchange in 1773 with the formation of others in the following years. We see this as well-known markets even to this day like the New York Stock Exchange were developed just 19 years later, which is known to be the most dominant stock exchange to date. (Investopedia)

Today, the stock market is a regulated electronic marketplace where individual and institutional investors can buy and sell shares in a public interface. These stocks or shares of a company are representative of ownership equity in the firm. It gives shareholders voting rights and

residual claim on corporate earnings in the form of dividends. The value of these shares is determined by supply and demand. If there is a great demand for a particular share, then its value will decrease and vice versa. A stock exchange is a centralized location that brings companies and governments together with investors so trading activity can take place, however, companies may not be listed on multiple exchanges. Initial Public Offering, also known as IPO, is when a private company makes shares public in a new stock issuance. (Investopedia)

1.3 Stock Market Indexes

A market index is a hypothetical portfolio of investment holdings that represent a segment of the financial markets. It is used as a benchmark to gauge the movement and performance of market segments. In the U.S. there are approximately 5,000 market indexes in which the top 3 are the Dow Jones Industrial Average (DJIA), Standard & Poor's 500 (S&P 500), and the Nasdaq Composite Index. These along with the other available indexes can be used to determine the performance of different sections of the market along with investing the public's risk appetite. (Investopedia)

1.3.1 S&P 500

Standard and Poor's 500 started in 1957, and among the many U.S. Indexes, it is the best gauge of large-cap U.S. equities. It is a weighted index of 500 of the largest publicly traded companies in the U.S. which is mostly made up of technology and financial companies. (Investopedia)

1.3.2 Dow Jones

Dow Jones Industrial Average is the second oldest index in the U.S. beginning in 1896. It is an Index that tracks 30 large blue-chip companies, meaning they are nationally recognized, well-established, and financially sound companies. (Investopedia)

1.3.3 Nasdaq

The Nasdaq Composite Index starting in 1971, is an index consisting of 3300 stocks that are generally biotech and technology giants. The Nasdaq 100 sub-index accounts for 90% of the movement within Nasdaq as it consists of the 100 largest and most frequently traded companies found in Nasdaq as a whole. (Investopedia)

1.4 Determining Factors of the Stock Market

There are many variables in these modern times which can have a major influence on the stock market, no matter how big or small these factors may seem. These factors include but are certainly not limited to industry performance, investor sentiment, and economic status.

1.4.1 Investor Sentiment

Investor sentiment or also known as investor confidence can be represented by a bull market or a bear market where the bull market is a market in which an investor is confident and invests while stock prices are rising. A bear market on the other hand is one such that it is perceived as weak as stock prices are falling and so is the faith of investors.

1.4.2 Company News

A company's stock price is often impacted by its performance or any news involving them. These factors can include a variety of company activities such as a new product, employee layoffs, earnings reports, and even drama occurring within the company.

1.4.3 Economic Status

The status of the economy is another major factor playing a role in the stock market. The business/economic cycle is made up of four phases expansion, peak, contraction, and trough. Expansion is the phase of the business cycle where real GDP grows for two or more consecutive quarters, moving from a trough to a peak. This is typically accompanied by a rise in employment, consumer confidence, and equity markets. (Known as the recovery after a recession) The peak is the highest point of the cycle between the end of an expansion and the start of a contraction. The last couple of months before key economic indicators begin to fall and when GDP is at its highest. Contraction is when the GDP has declined two or more consecutive quarters. (Also known as a recession) The trough is when economic activity is bottoming before it begins to rise and recover. The market will react differently depending on which cycle we are currently in. For example, during expansion, the stock market is bullish and during contraction, the stock market is usually bearish. Central banks also decide when to cut or increase interest rates depending on the status of the economy which can affect the stock market. When central banks increase the interest rates the stock market tends to head down and when they cut interest rates the stock market tends to head up. For example, in March 2020 the FED announced an emergency cut to zero which caused the market to switch from a bearish trend to a bullish trend in a couple of weeks. Global/Political conflict that influences the economy can also affect the stock market. If there are any problems or

potential problems investors would hesitate to buy shares due to fear which tends to cause sell-off to take place. Instead, investors would seek safe-haven investments like bonds or precious metals. For example, once COVID-19 cases started showing up in the US this caused a massive crash in the market due to fear but safe-haven investments like bonds or gold (precious metal) went up.

2. Trading Methodologies

2.1 Technical Analysis

In Stock market trading, Technical analysis is a technique in which data and trends are analyzed in order to find investment opportunities. While fundamental analysis of stocks has the tendency to focus on a business's sales, earnings, and financial status, technical analysis prioritizes the prices and volumes of stock. When looking at this type of data, a technical analyst is following patterns and fluctuations of prices and paying attention to trading signals, which suggest that a person buys or sells. This information is what assists analysts in determining their evaluation estimates. When focusing on data, analysts are not only looking at the current status of it but its history as well, as it can provide security in future investments.

When approaching technical trading, there are generally two types of ways to tackle it, either a top-down or a bottom-up approach. These two techniques differ and are used based on whether someone is a short-term or a long-term trader. For those who are short term traders, a top-down approach is the way to go. In technical trading, "the top-down approach is a macroeconomic analysis that looks at the overall economy before focusing on individual securities" (Investopedia). This means that someone who is trading using this method will focus on things in a particular order, beginning with the economy, then sectors, then a company's stocks. Unlike the top-down methodology, bottom-up focus on the individual stocks rather than having a macroeconomic view where they are analyzing a stock for potential entry and exit points (Investopedia). When doing this, a trader is often looking at a stock that is both in a downtrend and undervalued as their entry point. After investing in that certain stock, it is held onto for the long term with the intent for future trading.

2.1.1 Trendlines

Trendlines are lines that are drawn onto charts to connect multiple prices together over time to give an indication as to the direction and slope severity of a stock's varying value. Figure 2.1 gave an example. Trendlines are used to produce a more comprehensible view of a data trend. More than one line can be applied, in order to represent the highs and lows of a stock's history to create a channel. A channel is a pattern within a chart that can provide greater clarity of when to enter and exit a trade, as it could more clearly show a profit margin. When analyzing trend lines and channels, if it is angled upwards or there is a positive slope then there is an uptrend, and when angled down there is a downtrend. The width of a channel alongside the length and direction of it, assist in determining the strength of a trend.

Figure 2.1 Example of a trendline. BABA on the 4-hour time frame. Prices bounce up when it touches the trendline. The y-axis is the price of BABA in USD and the x-axis is the date.

2.1.2 Support/Resistance

Support and resistance are price levels on a chart that tend to act as a barrier that prevents the price from pushing to a certain direction. Figure 2.2 shows an example. Support is a price level where a downtrend can be expected to pause due to demand or buying interest at that price. Resistance is a price level where an uptrend can be expected to pause due to supply or selling interest at that price. When price reaches a support or resistance zone it can either bounce and break the zone and continue in its direction. (Investopedia) Traders can use areas of support or resistance to look for entries and exits for their trades.

Figure 1.2 Example of support/resistance zone. NFLX on the 4-hour time frame. Price can bounce when it touches a support or resistance zone. The y-axis is the price of NFLX in USD and the x-axis is the date.

2.1.3 Price Action

Price action is the movement of price plotted overtime. Price action forms the basis for all technical analysis of a stock, commodity or other asset charts. Most traders read price action using candlestick charts where the price is represented by a candle for a certain time frame. Figure 2.3 shows an example of a price action pattern. For example, on the one-hour time frame each candle represents one hour of price movement. These candlesticks can form certain patterns known as price action patterns which can give you an idea of the potential direction of price. Some patterns include engulfing candles, ascending/descending triangles, and double tops or double bottoms. Interpreting price action is subjective one trader may see price going up based on price action and the other may see it going down. The best way to use price action is in combination with other technical tools like trendlines and support/resistance.

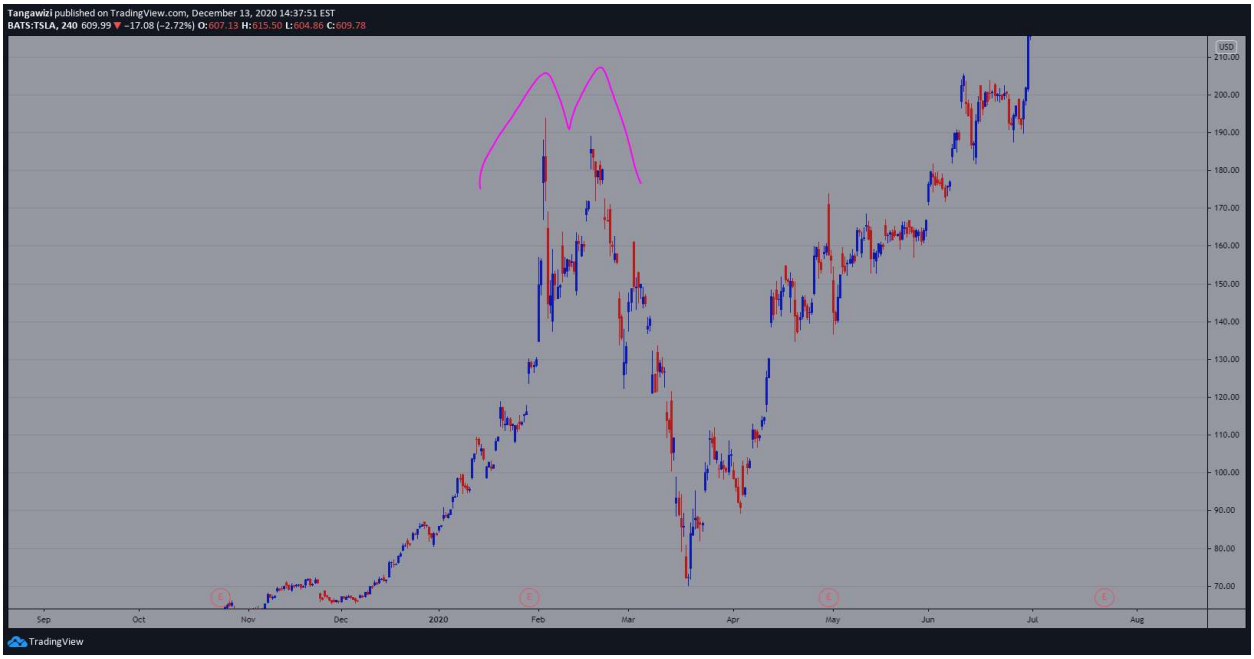

Figure 2.2 Example of a double top which is a price action pattern. TSLA on the 4-hour time frame. Prices made a double top then sold off.

2.2 Fundamental Analysis

Fundamental analysis is a method of measuring intrinsic value by examining related economic and financial factors. Fundamental analysts' study anything that can affect the security's value, from macroeconomic factors such as the state of the economy and industry conditions to microeconomic factors like the effectiveness of the company's management. (Investopedia) It is used to see if a stock is either undervalued or overvalued in order to identify securities that are not correctly priced in by the market. Analysts typically study, in order, the overall state of the economy and then the strength of the specific industry before concentrating on individual company performance to arrive at a fair market value for the stock. Traders can also pay attention to websites like Bloomberg who report news on different publicly traded companies and use the released news to form a bias on the stock.

2.2.1 Earnings Report

Quarterly earnings reports are a quarterly filing made by a public company to report their performance. Investors use earnings reports to gauge the financial health of a company to see whether they should invest or not. Earnings reports include items such as revenue, earnings per share, guidance, and net sales. Revenue is the amount of money the company has made before subtracting their cost. Earnings per share are equal to the total profit divided by the number of shares. Guidance is the amount of money the company expects to make in the next quarter. Net sales are how many products they sold that quarter. Analysts usually make predictions for these values prior to the release and when the actual data is better than predicted that is positive for the company and can cause an increase in the share price. If the actual is worse than the predicted it can potentially cause a drop in the share price.

2.2.2 Combination with technical analysis

The best way to trade using fundamental analysis is in combination with technical analysis. Once you have formed a fundamental bias whether that be long or short you would then use technical analysis (trendlines, support/resistance, price action) to find a price to enter and exit. If you only enter based on your fundamental idea you may experience a drawdown because the price may not go in the expected direction immediately so the best way to catch a good chunk of a move is to use technical analysis to enter. This will help you avoid drawdown and allow you to maximize your profit.

2.3 Trading Styles

2.3.1 Swing Trading

Swing Trading is aimed to create short-term or medium-term profits from stocks. When using this methodology, trades can last anywhere from just a few days up to months depending on the behavior of a stock. Swing trading is about trying to predict and capture a quick chunk of profit and then moving onto the next opportunity. The majority of traders using this strategy often base their trades on the ratio of risk to reward and analyze which stocks can produce the best outcome, while also taking into account the potential losses.

2.3.2 Day Trading

Day trading usually refers to the practice of purchasing and selling a security within a single trading day. While it can occur in any marketplace, it is most common in the foreign exchange (forex) and stock markets. They use high amounts of leverage and short-term trading strategies to

capitalize on small price movements that occur in highly liquid stocks or currencies. Day traders are attuned to events that cause short-term market moves. Trading based on the news is a popular technique. Scheduled announcements such as economic statistics, corporate earnings, or interest rates are subject to market expectations and market psychology. (Investopedia)

2.3.3 Scalping

Scalping represents the shortest-term trading style—even shorter than day trading. It got its name because traders who adopt the style—known as scalpers—quickly enter and exit the market to skim small profits off of a large number of trades throughout the trading day. Ideally, these small profits ultimately add up to what the trader would've earned making a single, more profitable day trade. Scalper trade on lower time frames usually 30 minute and below to try to catch quick moves throughout the trading day.

3. Shares vs Options

3.1 What Are Shares?

Shares of stock represent a piece of equity in a specific company. The value of a company's stock is determined by supply and demand. If you purchase shares and the value increases, then you can sell your share for a profit and if the price of the shares falls that would result in a loss. There is an option to short-sell shares where you would profit if the value of the share decreases. Shorting shares is very risky because hypothetically the value of a share can go up to infinity which means you can lose more money than the cost of the share whereas in buying the max loss is the cost of the share.

3.2 What Are Options?

Options are a form of trading in which you are essentially betting against the security of a particular stock. Unlike stocks which grant partial ownership of a company, options are contracts that give you the ability to buy or sell 100 shares of a stock for a specific price by a certain date, meaning that options have an expiration date. To get the price/cost of an option contract you must multiply the premium by 100 because when an option contract is exercised you get the right to `buy or sell` 100 shares of the stock. In options trading, when you are buying an option, it means that you are buying that option from somebody who is selling it. For each set of options you buy, there may also be a commission fee added onto the total, depending on what brokerage one may use. For example, brokerages such as Robinhood, do not charge a commission for trades, while Ameritrade has a $0.65 commission fee per option.

There are two types of options named calls and puts. When buying calls, you have the "option" or right to buy 100 shares of a stock at a set price (also known as the strike price) at any time before its expiration date if the contract is in-the-money. Puts, on the other hand, are contracts that grant the right to sell 100 shares of a certain stock at the strike price before its expiration date if the contract is in-the-money. The cost of an option is known as the premium, in which the buyer cannot lose more than the initial amount that they paid for it. Figure 3.2.1 shows what an option contract looks like.

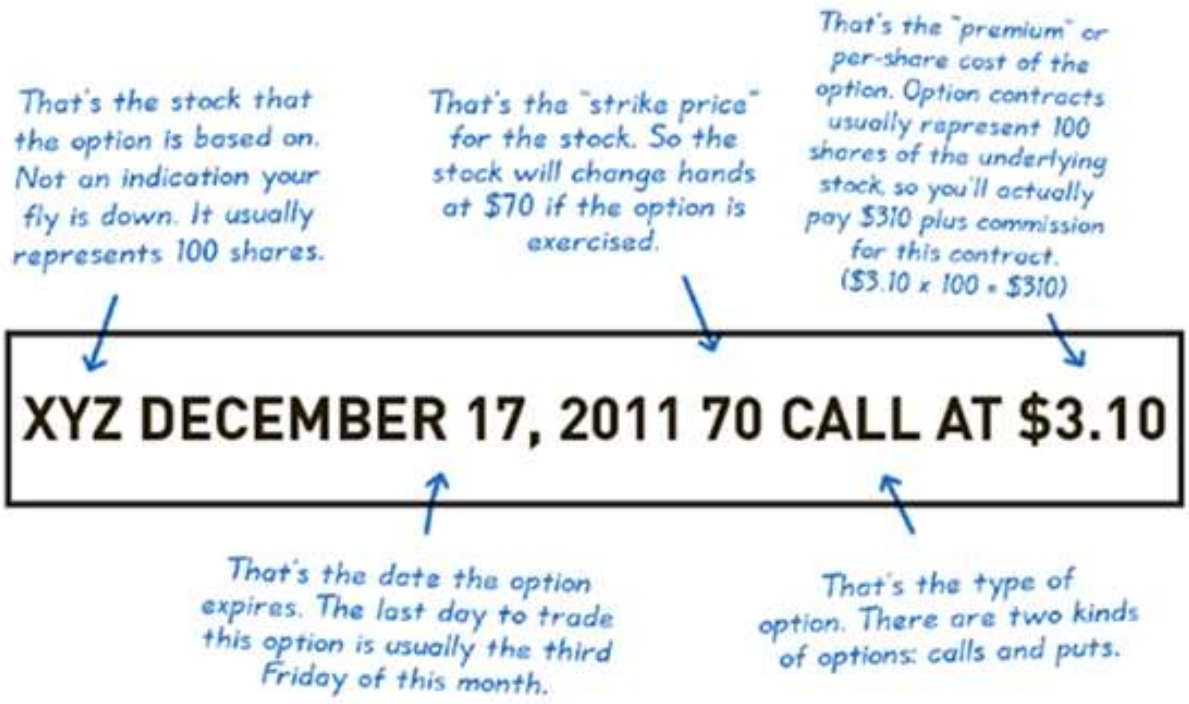

Figure 3.2.1 This image shows what is in an option contract.

Options can be in-the-money, out-the-money, or at-the-money. In-the-money for call options means that the strike price of the contract is less than the value of the shares at that time. For example, if Apple shares are at $200 then all call options with a strike price of $199 and less are in the money. In-the-money contracts are worth more money because if you want to exercise your option contract it must be in-the-money or at-the-money. In-the-money contracts for put

options means that the strike price of the contract is greater than the value of the shares at that time. Out-the-money for call options means that the strike price of the contract is greater than the value of the share at that time. For example, if Apple shares are at $200 then call options with a strike price of $201 and greater are out the money. These contracts are worth less because if they are out the money at the time of expiration then they are worthless, and you cannot exercise the contract. For put options, if the strike price is less than the value of the share then they are out of the money. At-the-money for both calls and puts means the strike price is the same as the price of the share at the time.

For our simulation, we will not be exercising the options contracts instead once the premium of a contract we have has increased we will sell it for profit. If you suspect the value of a stock to increase in value, you will purchase call options and if the stock price rises you can sell your call options for a profit. If you suspect the value of a stock to decrease in value, you will purchase put options and if the stock price falls you can sell your put options for profit.

4. Selected Companies

For this simulation, we have decided to find trading opportunities between 9 different companies and one ETF. All the companies chosen are considered big-cap or mega-cap stocks meaning they are companies valued over 10 billion dollars. These were all chosen because of the large trading volume daily which results in more movement and potential opportunities.

4.1 Apple

Apple was founded on January 3rd, 1977 by Steve Jobs and Steve Wozniak. What began as a company that only focused on the development of apple computers for more than 30 years? Today, not only is Apple known for their computers like the MacBook's and Mac Pros, but also their mobile devices such as the iPhone and iPad, the Apple watch, Apple TV, Home pod and many more devices. What had once been a struggling company in the 1990's boomed and is now the world's largest tech giant. The company went public in 1980 at $22 per share. Apple has split their stocks five times since they went public. They have done a 2 for 1 split three times meaning one additional share for every share held, a 7 for 1 once meaning six additional shares for every share held, and a 4 for 1 once meaning three additional shares for every share held. The purpose of these splits was to lower the trading price of their stock to a range comfortable for investors. Today one share of Apple is valued at about $117.

According to data provided by google in 2020, Apple has a Revenue of $274.52 Billion with a net income of $57.41 Billion. Their Market cap is set at nearly $2 Trillion, with a volume of 123.39 million, meaning that there is an average of 123.39 million shares traded each day over the course of the past 30 days.

4.2 Adobe

Adobe was founded in December of 1982 by Charles Geschke and John Warnock. It is a computer software company which is known for focusing on building creativity software products. Some of their products include Adobe Flash, Photoshop, Illustrator, Acrobat reader, Adobe Creative cloud, Adobe Premiere Pro, After Effects and more. The company went public in 1986 at $11 per share. Adobe has done five 2 for 1 stock splits since then and today one share of is valued at $462.92. In 2019, Adobe had a Revenue of $11.17 billion and a net income of $2.95 billion. As of November 21st, 2020, they have a market cap of $222.07 billion and have an average of 2.5 million shares traded each day over the past 30 days.

4.3 Amazon

Amazon was founded by Jeff Bezos on July 5th, 1994. At the time, Amazon was known as an online retailer for books, which has now grown into a marketplace for just about anything, from electronics, software, clothing, food, furniture, toys, jewelry, and digital books for their kindle device. Not only is amazon a marketplace for these products, but they are also developers of many of their own types of electronics like many of their smart home devices like the amazon echo and services for music and video which have sparked a world of change. The company went public in 1997 at $18 per share. Amazon has done three stock splits since then, two 2 for 1 and one 3 for 1. Today one share of Amazon is valued at about $3099. In 2019, Amazon had a revenue of $280.52 billion and a net income of $11.59 billion. As of November 21st, 2020, Amazon has a market cap of 1.56 trillion and an average of 5.27 million shares traded per day over the past 30 days.

4.4 Alibaba

Alibaba was founded in 1999 by 18 people and was led by Jack Ma. Alibaba is a website which is aimed towards exporting Chinese manufactured products and distributing them around the world. Today, Alibaba is most known for its online wholesale marketplace and digital media. Alibaba went public on the NYSE on September 19th, 2014 with an initial stock price of $92.70. Today the value of one of one share is roughly $270. In 2020, Alibaba has a revenue of $509.71 billion and a net income of $149.43 billion. Currently, the value of their stock is $270.74, with their market cap being $732.52 billion. Over the course of the past 30 days, there has been an average of 21.16 million shares traded each day.

4.5 Facebook

Facebook was launched on February 4th, 2004 by Mark Zuckerberg. When Facebook first launched it was intended to be a social media website to connect fellow Harvard students to one another. Over time, Facebook evolved into one of the most influential social media companies, which today is the home of over 2 billion active users every month. The company went public on May 18th, 2012 with an initial stock price of $38 while today, one share is valued at roughly $270. In 2019, Facebook had a Revenue of $70.7 billion and a net income of $18.49 billion. Currently, their market cap is set at $768.18 billion with an average of 20.35 million shares traded each day over the past 30 days.

4.6 Microsoft

Microsoft was founded on April 4th, 1975 by Bill Gates and Paul Allen as a company that creates computer software. Microsoft is known for creating the most popular computer operating

systems, Windows which was released in 1985. The company went public in 1986 at $21 per share. Microsoft has split their stocks nine times since they went public. They have done a 2 for 1 seven times and a 3 for 2 two times. Today one share of Microsoft is valued at about $210. In 2020, Microsoft had a revenue of $143 billion and a net income of $44 billion. As of November 21st, 2020 Microsoft, has a market cap of 1.59 trillion and an average of 29.94 million shares traded per day over the past 30 days.

4.7 Netflix

Netflix was founded in August of 1997 by Marc Randolph and Reed Hastings. Netflix was originally a movie rental service where users would order movies from their site and they would be mailed to the customer's house. Once the customer was done, they would mail it back. Now Netflix is one of the biggest platforms to stream movies and tv series with over 150 million subscribers in more than 190 countries. Netflix went public in 2002 for $15 per share. The company has had two stock splits: a 2 for 1 and a 7 for 1 split. Today one share of Netflix is valued at about $488. In 2019, Netflix had a revenue of $20.15 billion and a net income of $2.6 billion. As of November 21st, 2020 Netflix, has a market cap of 215.7 billion and an average of 6.24 million shares traded per day over the past 30 days.

4.8 Shopify

Shopify was founded in 2004 by Tobias Lutke, Daniel Weinand, and Scott Lake. These guys were trying to open an online store for snowboarding equipment but were dissatisfied with the existing e-commerce products, so they built their own. They launched Shopify in June 2006. Shopify is an e-commerce company that offers online retailers a suite of services to create an online

store including payments, marketing, shipping, and customer service tools. The company went public in 2015 at $17 per share. They have done zero stock splits so far and today one share of Shopify is valued at $988.In 2020, Shopify had a revenue of $1.57 billion and a net income of $141 million. As of November 21st, 2020 Shopify, has a market cap of 120.51 billion and an average of 1.51 million shares traded per day over the past 30 days.

4.9 SPDR S&P500 ETF Trust

SPDR(Spy) is an ETF fund that tracks the S&P 500 index. You cannot actually trade the indexes so instead; you can trade the ETFs that track the index. Spy has generated an average 3-year return of 6.23% and achieving annual returns of about 8.93%. Today one share is valued at about $355.

4.10 Zoom

Zoom was founded in 2011 by Eric Yuan. Zoom is an online video conferencing app that allows multiple users to get onto a video call and communicate with each other. Zoom officially launched in 2013. They went public in 2019 at $36 per share. In 2020 when coronavirus hit the US, many schools decided to use zoom to conduct online classes along with different businesses and this brought the share price from around $80 in early 2020 to $439 today. In 2020, Zoom had a revenue of $623 million and a net income of $13 million. As of November 21st, 2020, Zoom has a market cap of 125.03 billion and an average of 10.36 million shares traded per day over the past 30 days.

5. Fundamental Trading Simulation

For this part of the simulation, fundamental analysis will be used to find opportunities and technical analysis will be used to find an entry and exit for the trade. For our simulation, we are using Investopedia's trading game and have each started with $250,000 to attempt to create the greatest profit margin over a 10-week period. For consistency, we are both using a web application called trading view to analyze and study our 10 chosen company's stocks. Our main strategy is to pay attention to news that can affect any of the 10 stocks we are watching and determining whether the news can cause price movement and trade opportunities.

5.1 Week 1

The first fundamental opportunity spotted was with Microsoft (MSFT). They had announced that they will be releasing Halo Infinite in 2021 which is an anticipated game. On top of that they also partnered with Co& Deutsche Telekom to deliver high performance cloud computing experiences. Both headlines are positive and should increase the demand for Microsoft shares and cause share prices to increase. Due to this we purchased 40 call contracts at an ask of $1.16 per contract making the total premium to $4640 not including the $89.99 commission fee. We purchased the contract once price had touched a trendline on the 1-hour timeframe (see Figure 5.1.1). This is a swing trade, and it should remain technically valid if price stays above $211.

Figure 5.1.1 Graph of the value of MSFT per hour from December 18th up until December 9th (with the x axis representing day and the y representing USD value). Pink circle is where price touched the trendline again and the contracts were purchased.

Another fundamental opportunity that was spotted was with Adobe (ADBE). They released their quarterly earnings report on Dec 10^{th,} and they had beat analyst expectations. In most cases when a company beats earnings the share value of a company increases in the short to mid-term, so I purchased 3 call contracts at $17.20 per contract bringing the total cost to $5160 not including the $25.24 commission fee. We purchased the contracts once price had touched a trendline on the 1-hour timeframe (see Figure 5.1.2). This is also a swing trade, and it should remain technically valid if price stays above $472.

Figure 5.1.2 Graph of the value of ADBE per hour from December 12th up until December10th (with the x axis representing day and the y representing USD value). Pink circle is where price touched the trendline again and the contracts were purchased.

Table 5.1.1 shows the transactions for Week 1. We plan on holding these contracts until they are about to expire or if the trade is no longer technically valid.

Table 5.1.1: Transactions Week One. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/ Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit /Loss
12/7							$250000	
12/9	MSFT(c)	Buy	1.16	40	4729.99		$245270.01	
12/10	ADBE(c)	Buy	17.20	3	5185.24		$240084.77	

5.2 Week 2

The only fundamental opportunity spotted this week was for Alibaba (BABA). BABA is an eCommerce company, and they all perform very well in this situation because everyone is staying home and ordering items online. Stimulus conversations are also going well and if we get another stimulus plan passed then we could see another rally in the overall market as we saw in late March of 2020. We purchased 5 call contracts at $11.25 per contract bringing the total cost to $5,653.74 including the $28.74 commission fee. The call contracts were purchased once the price had broken a level and resistance and a trendline, and then came back down to retest it (see Figure 5.2.1). This is a swing trade and should remain technically valid if the price does not break below the previous low.

Figure 5.2.1. Graph of the value of BABA per hour from November 16th up until December17th (with the x axis representing day and the y representing USD value). Pink circle is where price broke above the trendline and the contracts were purchased.

Table 5.2.1 shows the transactions for Week 2. We plan on holding these contracts until they are about to expire or if the trade is no longer technically valid.

Table 5.2.1: Transactions Week Two. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit/Loss
12/17	BABA(c)	Buy	11.25	5	5653.74		234431.06	

5.3 Week 3

In the third week, there were not any solid trades backed by fundamentals. This week the MSFT calls were closed in profit because they expire in the next couple of days which means they will start to lose value quicker as the expiration date gets closer. We sold all 40 MSFT calls at $1.60(the original price was $1.16) The BABA calls were also closed because BABA gapped down due to the antitrust lawsuit, so we had to cut my losses on the trade, and it also became technically invalid at that point (see Figure 5.3.1). The 5 BABA calls were sold at $2.20(the original price was $11.25).

Figure 5.3.1 Graph of the value of BABA per hour from November 9th up until December 26th (with the x axis representing day and the y representing USD value). Price gapped down due to negative news on the company.

Table 5.3.1 shows the transactions for Week 3. There were no new purchases this week due to the lack of fundamentals with the companies we are watching.

Table 5.3.1: Transactions Week Three. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/ Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
12/21	MSFT(c)	Sell	1.60	40	6310.01	1580.02	240741.07	1580.02
12/24	BABA(c)	Sell	2.20	5	1071.26	-4582.48	241812.33	-3002.46

5.4 Week 4

This week we decided to purchase Netflix calls in anticipation of another wave to the upside for Netflix. Many people are home due to the current situation and because of that Netflix has gained millions of new subscribers in late 2020 which equals more growth for the company and increases the demand for their shares. Another stimulus package was also passed which includes $600 checks which should provide another boost to the upside in the overall market. We decided to purchase the contracts once the price had touched a trendline. (see Figure 5.4.1) We purchased 5 call contracts each $29.20 for a total cost of $14628.74 including the $28.74 commission. This is a swing trade and should remain valid if the price maintains a bullish structure.

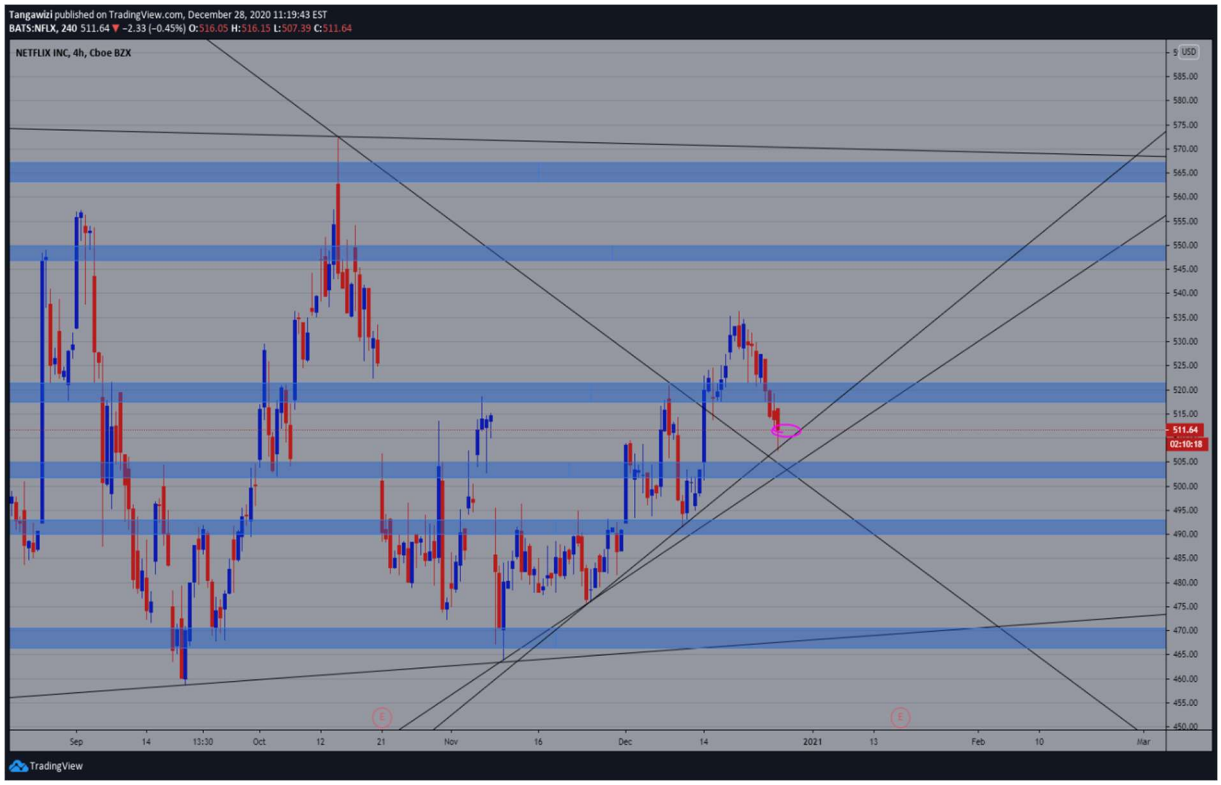

Figure 5.4.1 Graph of the value of NFLX every four hours from September 1st up until December 28th (with the x axis representing day and the y representing USD value). Pink circle is where price touched the trendline and when the contracts were purchased.

The Adobe calls that were purchased in week one was closed this week. The contract's expiration date was near, so we decided to take profit on top of that price created a lower high on the one-hour timeframe indicating a potential bearish move incoming (see Figure 5.4.2). All three contracts were sold at $18.65(The original price was $17.20)

Figure 5.4.2 Graph of the value of ADBE every hour from November 16th up until December 30th (with the x axis representing day and the y representing USD value). The upper pink circle is where the contracts were sold after a lower high. The lower pink circle is where the contracts were purchased.

Table 5.4.1 shows the transactions for Week 4. We plan on holding the NFLX call options until market structure turns bearish or fundamentals shift. The profit on the adobe calls was minimal due to the entry which caused some drawdown, and the expiration date was close which causes the contracts to lose value.

Table 5.4.1: Transactions Week Four. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
12/28	NFLX(c)	Buy	29.20	5	14628.74		227183.59	-3002.46
12/29	BABA(c)	Sell	18.65	3	5569.76	384.52	232753.35	-2617.94

5.5 Week 5

This week we decided to purchase Microsoft calls. The Democrats won the race for senate which is in favor of the equities market because they are known for spending, so another stimulus package is possible. On top of that, the stimulus that included $600 dollar checks were passed. This fundamental idea isn't specific for Microsoft, but it should also give stocks such as MSFT a boost up. We decided to purchase the contracts once the price had broken above a trendline (see Figure 5.5.1). Ten MSFT call contracts were purchased each at $6.80 for a total cost of $6837.49 including the $37.49 commission. This is a swing trade and will remain valid if the price maintains a bullish market structure and fundamentals do not switch.

Figure 5.5.1 Graph of the value of MSFT every hour from December 9th up until January 8th (with the x axis representing day and the y representing USD value). The pink circle is where the contracts were purchased once price broke above the trendline.

The Netflix calls that were purchased on week 4 were also closed this week. The overall market sold off a bit on 1/4/21 so we decided to sell 4 of my 5 call contacts for $36.65(the original price was $29.20) to secure some profit. We decided to hold one contract and then sold the last contact for $23.35 once the price had broken below a low and a trendline (see Figure 5.5.2).

Figure 5.5.2 Graph of the value of NFLX every four hours from September 17th up until January 6th (with the x axis representing day and the y representing USD value). The pink circle is where the last contract was sold, and the pink star is where they were all purchased

Table 5.5.1 shows the transactions for Week 5. We plan on holding the MSFT call options until market structure turns bearish or fundamentals shift. The Netflix contracts we had lost a lot of value on the 4th of January after that sell off which is why there is small amount of profit. The last NFLX call we decided to hold thinking the market would continue up after the selloff lost even more when the price gapped down on the 6th of January.

Table 5.5.1: Transactions Week Five. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
1/4	NFLX(c)	sell	30.65	4	12233.01	500	244986.36	-2117.94
1/6	NFLX(c)	sell	23.35	1	2313.26	-582	247299.62	-2699.94
1/8	MSFT(c)	buy	6.80	10	6,837.49		240462.13	-2699.94

5.6 Week 6

There were not any solid fundamental opportunities this week, so no new trades were taken.

5.7 Week 7

There were not any solid fundamental opportunities this week, so no new trades were taken.

5.8 Week 8

There were no fundamental opportunities this week as the market was focused on the GME short squeeze. The Microsoft calls from week 5 were closed this week. After a good earnings report MSFT did head up a bit but ending up gapping down on the 29th of January (as shown in Figure 5.8.1) so we decided to secure the profits and sell the contracts we were holding.

Figure 5.8.1 Graph of the value of MSFT every hour from December 1st up until January 29th (with the x axis representing day and the y representing USD value). The upper pink circle is where I sold the call contracts, and the lower pink circle is where they were bought.

Table 5.8.1 shows the transactions for Week 8. This week profits were secured as there were no new fundamental opportunities.

Table 5.8.1: Transactions Week Eight. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
1/29	MSFT(c)	Sell	13.65	10	13612.51	6775.02	254074.64	4074.64

5.9 Week 9

This week we decided to purchase Amazon call contracts. At the beginning of the week Amazon released their earnings report for the last quarter of 2020 and they beat analysts' expectations which is positive news for the company. This should lead to an increase in demand for amazon shares which will cause stock prices to increase. We purchased the calls once price had bounced on a support level (see Figure 5.9.1). We purchased 1 call contract at $97.90 for a total cost of $9,811.74 including a $21.74 commission fee. This is a swing trade and will remain valid if the price maintains a bullish market structure and fundamentals don't switch.

Figure 5.9.1 Graph of the value of AMZN every hour from December 15th up until February 5th (with the x axis representing day and the y representing USD value). The pink circle is where the contracts were purchased.

Another fundamental opportunity that was spotted is Alibaba. The company resolved the anti-trust lawsuit and their earnings report for the last quarter of 2020 beat analyst expectations. Both events should further push the price of the company shares higher. We decided to purchase 7 call contracts once the price touched a support level (see Figure 5.9.2). Each call contract cost $10.85 for a total cost of $7,627.24 including a $32.24 commission fee.

Figure 5.9.2 Graph of the value of BABA every hour from December 15th up until February 5th (with the x axis representing day and the y representing USD value). The pink circle is where the contracts were purchased.

Table 5.9.1 shows the transactions for Week 9.

Table 5.9.1: Transactions Week Nine. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
2/5	AMZN(c)	Buy	97.90	1	9811.74		244262.9	4074.64
2/5	BABA(c)	Buy	10.85	7	7627.24		236635.66	4074.64

5.10 Week 10

This week there were no new fundamental opportunities on any of the stocks on our watchlist. The Amazon and Alibaba calls that were purchased last week were sold this week. In the middle of the week the price of Amazon broke a level of support and created a low (see Figure 5.10.1) which made that trade technically invalid, so we sold our call contracts and cut our losses.

Figure 5.10.1 Graph of the value of AMZN every hour from December 15th up until February 10th (with the x axis representing day and the y representing USD value). The pink circle is where the contracts were sold.

At the end of the week Alibaba's price broke below a trendline and a support level (see Figure 5.10.2) which also made this trade invalid.

Figure 5.10.2 Graph of the value of BABA every hour from December 15th up until February 12th (with the x axis representing day and the y representing USD value). The pink circle is where the contracts were sold.

Table 5.10.1 shows the transactions for Week 10.

Table 5.10.1: Transactions Week Ten. The price of an option contract is the premium multiplied by 100 + commission.

Date	Symbol Call(c)/ Put(p)	Buy/ Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
2/10	AMZN(c)	Sell	74.50	1	7428.26	-2386.48	244063.92	1688.16
2/12	BABA(c)	Sell	10.10	7	7037.76	-586.48	251101.68	1101.68

5.11 Simulation Results

As of Friday, February 13th our trading simulation had come to an end. After 10 weeks of continuous analysis of our 10 stocks fundamentals our trading resulted in a small profit when trading with fundamental analysis. Over the course of 10 weeks, we would have weeks in which we ended with profit, some with no gain or loss and others with loss, however in the end, we made a total of $1101.68 or about 0.44% of our initial starting amount. There were two weeks during the simulation where no new trades were taken due to the lack of fundamental ideas which is one downside to trading only fundamentals. There may be an extended period where nothing is going on fundamentally in the market or with the stocks on your watchlist resulting in no trade ideas. This can also be a benefit as it can prevent you from taking bad setups and losing money.

6. Technical Trading Simulation

For this part of the simulation, only technical analysis is to be used meaning that charts and graphs representing shares will be the main resource for determining trading decisions. For our simulation, we are using Investopedia's trading game and have each started with $250,000 in order to attempt to create the greatest profit margin over a 10-week period. For consistency, we are both using a web application called trading view to analyze and study our 10 chosen company's stocks. For the technical trading portion of the simulation, Liam's main strategy is to maximize profit and cut losses is to find an easy way to make around $10,000 (for a total account value of $260,000) from the first trade so that we can recycle that profit in order to prevent dipping into the initial $250,000 as much as possible. The plan is to utilize swing trading, so that our profit margin is maximized due to the greater change in value over the course of a few days. At the end of each section, we have a table identifying the corresponding weeks trade history, from using the technical analysis trading strategy.

6.1 Week 1

The day in which we began trading was Tuesday, December 8th. SPY seemed to be at an all-time high and expected to see a fall over the course of either a few days or a month after reviewing the stocks history (see Figure 6.1.1). Due to this we purchased 40 put contracts at an ask price $3.83 per option making the total premium paid to be $15360, not including the 89.99 commission fee. At the time of purchase, the stock price for SPY was sitting at $369.56 while the strike price for each option was $373. The hope is that the stock price will go down to $367 so that we can make roughly $10,000. In Figure 6.1.1 we can see that the prices are steadying out at the peak as the candlesticks are small and have little to no wicks, meaning that the price isn't moving

so much. On December 9th, the value of the stock had lowered into the $366 range, so we sold our put contracts which put me at an account value of $260,460.02. we had now obtained my initial $10,000 profit to allow me to make more risky but profitable trades in future.

Figure 6.1.1. Graph of the value of SPY per day from May 14th up until December 8th (with the x axis representing day and the y representing USD value), showing how it broke free of a certain threshold and is likely to fall.

After making the $10,000 we found FB also known as Facebook to be at a lower point in a trend, which seems to follow two certain trends as shown in Figure 6.1.2. As we can see FB has the tendency for its higher highs to follow a certain trendline and its lower highs to follow another. The trend line in which the higher points of the stock reach have a greater slope than that of the lower ones, meaning that as long as the prices stay within that range, there is great opportunity to make profit on the rise of Facebook's stock price as it will hopefully climb to the top trendline. As

a result of this analysis on Friday December 11’th, 10 call options contracts were purchased, with a price of $11.05 per option and a strike price of $270. This came to a total of $11,987.49. As of the time of the market closing on Friday, the value of Facebook's stock is $273.55. The intent here is to implement day hold onto the contracts for a couple of weeks and have the value increase to $280 or more.

Figure 6.1.2 Graph of the value of FB per day from May 1st up until December 11th (with the x axis representing day and the y representing USD value), showing how Facebooks stock is moving within a certain cone over the past couple of months.

One of the stocks we have not bought a contract for, but we are keeping our eyes on is NFLX or Netflix. The reason for this is because over the past few months, the fluctuation of its stock price seems to have been following a pattern. As we can see in Figure 6.1.3, the value of a share consistently hits a high point at $572 and bottoms out at $463. While following the price for NFLX, we are looking for it to reach one of the two values previously listed. If it were to reach $572, we plan on purchasing a large amount of put contracts and if it reached $463, we would want to buy calls.

Figure 6.1.3 Graph of the value of NFLX per day from June 1st up until December 8th (with the x axis representing day and the y representing USD value), showing how NFLX stock is bouncing in between a certain threshold for around half of a year.

Table 6.1.1. Provides the trading history for Week One, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.1.1: Transactions Week One

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
12/7							250000	
12/8	SPY(c)	Buy	3.84	40	15449.99		234550.01	
12/9	SPY(c)	Sell	6.48	40	25910.01	10460.02	260460.02	10460.02
12/11	FB(c)	Buy	11.98	10	11987.49		248472.53	10460.02

6.2 Week 2

During week 2 of trading, not too many stocks out of our 10 options seemed to catch the eye other than Alibaba. When studying the trend of Alibaba, it seemed as if the value of the stock were reaching a steady point and would then bounce back upwards. This prediction is due to previous history of the stock. As we can see in Figure 6.2.1, the graph suggests that once the value of the stock touches close to $252 or the blue horizonal line, that the value of Alibaba's stocks will begin to rise again. Because of this analysis of the stock's behavior, we bought 6 contracts for BABA at $18.20 per call, making the total premium paid to be $10,950.49 with commission. The Intention here is to buy this contract and hold onto it for a few weeks to maximize profit.

Figure 6.2.1 Graph of the value of BABA per day from August up until December 15th (with the x axis representing day and the y representing USD value), showing how BABA stock is slowly falling to a low point after a few months.

Table 6.2.1. Represents the trading history for Week Two, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.2.1: Transactions Week Two

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
12/15	BABA(c)	Buy	18.20	6	-10950.49		237522.04	10462.02

6.3 Week 3

When week 3 of trading came around, we had been watching the activity of Facebooks stock closely as it had a distinct pattern in which we were hoping for it to follow. The direction of the stock however was not behaving as predicted, as it was falling beneath the trendlines in which the earlier values of the stock had followed. As we can see in Figure 6.3.1, rather than the stock continuing the pattern of higher highs and higher lows, it dipped out of the "blue cone" thus it seemed unlikely that the value would trend back upwards. In response to this, we had sold our 10 FB contracts on December 23'rd for 3.36 per call, giving us a total of $3,362.51 in return. Selling our options resulted in a loss of $8,624.98 as the premium paid for the options had initially been $11,987.49.

Figure 6.3.1 Graph of the value of FB per day from late August up until December 23rd (with the x axis representing day and the y representing USD value), showing how FB stock was bouncing in between 2 trendlines and eventually fell out of the pattern.

Table 6.3.1. Represents the trading history for Week Three, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.3.1: Transactions Week Three

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost/ Proceeds	Profit / Loss	Total Cash	Total Profit
12/23	FB(c)	Sell	3.36	10	3362.51	-8624.98	240884.55	1837.04

6.4 Week 4

During the 4th week of trading, quite a few potential trading opportunities seemed to appear from our choice of 10 different stocks. The first stock which gives the impression that it will result in profit as it seems to have reached a maximum for the near future is SPY. If we look at Figure 6.4.1, we can see that SPY had a quick period in which it jumped up in value starting on October 30th and then it steadily rose. Due to the nature of the spike in value and seeing that the candlesticks in December were exceedingly small, we believed that the stock for SPY was prepared to fall in value, therefore 20 put contracts were bought for $9.84 each, for a total premium of $19,734.99 to be paid.

Figure 6.4.1 Graph of the value of SPY per day from September up until December 28th (with the x axis representing day and the y representing USD value), showing how SPY stock is steadily on the rise since October 30th.

Along with the rise of SPY's stock rose the value of Apple's stock as well. Although the stock seemed to be reaching a high point, we tried an unconventional approach in which we predicted that the value of the stock (although at a recent highpoint as seen in Figure 6.4.2) will continue to increase and will dramatically spike upwards in the near future. The intent here is to buy call options and keep those contracts until a decent profit is made. By that time, we hope to sell the contract before it may dramatically dip. In this case, 20 call contracts had been bought at $4.75 per option, meaning the premium paid was $9,554.99.

Figure 6.4.2 Graph of the value of AAPL per day from September up until December 29th (with the x axis representing day and the y representing USD value), showing how AAPL stock is following a climbing pattern in which it peaks at "higher highs" and slightly decreases.

Table 6.4.1. Represents the trading history for Week Four, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.4.1: Transactions Week Four

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
12/28	SPY(p)	Buy	9.84	20	-19734.99		220929.56	1837.04
12/29	AAPL(c)	Buy	4.75	20	-9554.99		211374.57	1837.04

6.5 Week 5

The start of the 5th week of trading seemed to present an opportunity that could yield great profit. When starting this week's Monday off by analyzing our charts on trading view, Shopify seemed to have dipped a significant amount as shown in Figure 6.5.1 After watching the value of our portfolio dip due to current unsuccessful predictions, Desperation for profit grew as we needed to make up for some, if not all the lost value in our portfolio. Knowing this, we spent a total of $21,028.74 on 5 contracts which cost $42 each on January 6 after waiting for the value of it to continue to fall over the course over the last couple of days.

Figure 6.5.1 Graph of the value of SHOP per day from October 8th up until January 6th (with the x axis representing day and the y representing USD value), showing how SHOP stock had spiked and is dipping back down.

Table 6.5.1. Represents the trading history for Week Five, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.5.1: Transactions Week Five

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
1/6	SHOP(c)	Buy	42.00	5	-21028.74		190345.26	1837.04

6.6 Week 6

As we had hoped for in the previous week, Shopify stocks seemed to have produced a great amount of profit as in as little as 3 days, the value of shares had grown by nearly $100. As we did not want to get too greedy and hold onto the contract for too long, we sold our 5 contracts on January 11th for 116.80 each, for a total of $58,400.57, nearly tripling the initial amount invested. As a result of this trade, we profited $37371.83 which brought us back to a total cash amount of $248,745.83.

Figure 6.6.1. Graph of the value of SHOP per day from October up until January 11th (with the x axis representing day and the y representing USD value), showing how SHOP stock had quickly risen after a significant decline.

On the 15th of January most of the current contracts that we held were beginning to expire, thus we needed to begin to sell them off so we could get some money back despite the many losses. For SPY, we expected the value to go down and in response to that bought put contracts. Unlike we predicted the value of SPY continued to grow and this contract along with a few others were kept too long with the hope that profit margins would increase. As there was no more time for SPY to fall in value, all 20 put contracts were sold for $0.41 each, resulting in a loss of $18969.98 for all the contracts of SPY that were held.

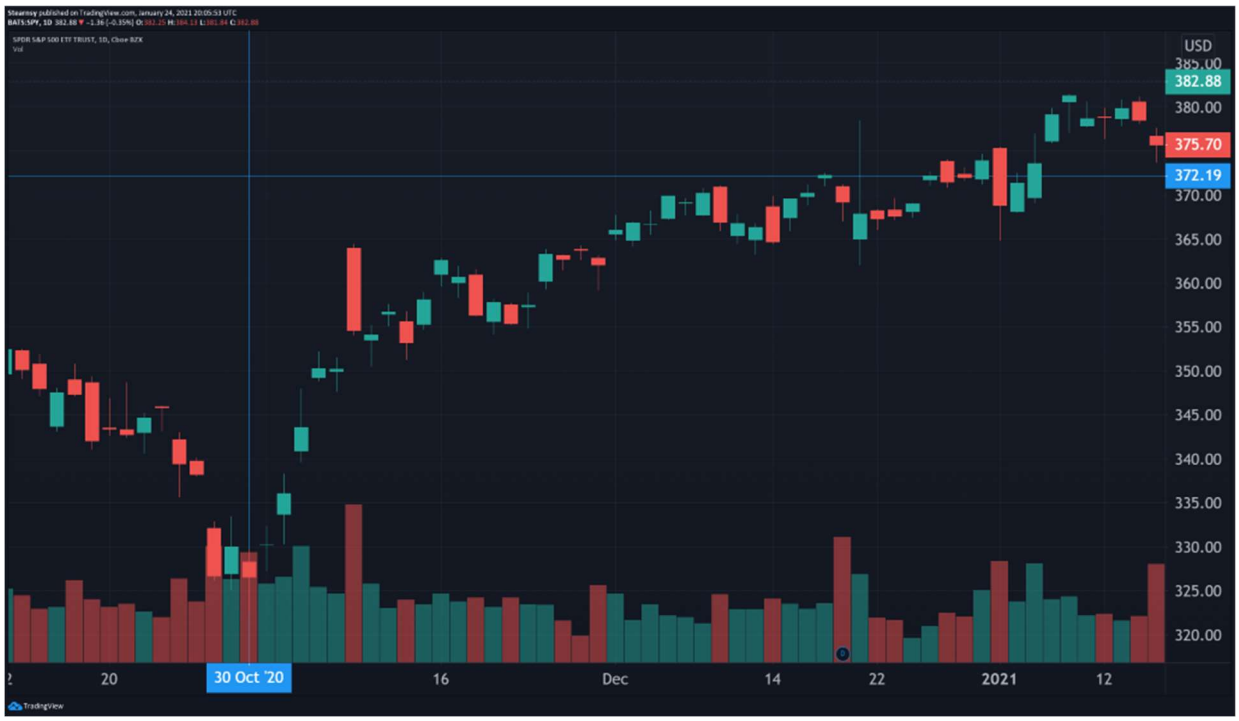

Figure 6.6.2. Graph of the value of SPY per day from September until January 15th (with the x axis representing day and the y representing USD value), showing how SPY stock steadily growing over the course of a few months.

Alibaba was unfortunately another one of the stocks which had behaved opposite as of how we had predicted. It was believed that the stock value would climb past the blue horizontal line as shown in Figure 6.6.2 below due to the dramatic dip in value after late December. However, the expiration date on the option was nearing and profit was not being made, therefore the 6 BABA contracts were sold for $4.75 each, meaning that we lost $8130.98 from our initial purchase of the contracts.

Figure 6.6.3. Graph of the value of BABA per day from October up until January 15th (with the x axis representing day and the y representing USD value), showing how BABA stock had fallen and then starting January 12th it began to climb.

During week 6, the loss of potential profit from our Apple contract offered great learning experience, the first lesson being that we should not always hold onto a certain option for too long and hope for profit. It would be safer to accept partial loss rather than complete loss. The second lesson is that it can sometimes be better to let a contract expire as you can end up having to pay a

commission fee rather than collecting a little value when selling our contracts. With Apple, it was predicted that profit could be made if calls were bought, as the behavior of the stock's value seemed to be following a pattern in which it would climb, then fall slightly in value. In attempt to capitalize on this, we hoped to follow AAPL on a trend upwards. The issue however was that after slight growth after a longer decline, the value of the stock fell back down and leveled out as a loss in profit as seen in Figure 6.6.4.

Figure 6.6.4 Graph of the value of AAPL per day from October up until January 15th (with the x axis representing day and the y representing USD value), showing how AAPL stock is steadily declining after a period of growth.

Table 6.6.1. Represents the trading history for Week Six, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.6.1: Transactions Week Six

Date	Symbol Call(c)/ Put(p)	Buy /Sell	Price	Contracts	Net Cost/ Proceeds	Profit / Loss	Total Cash	Total Profit
1/11	SHOP(c)	Sell	116.80	5	58400.57	37371.83	248745.83	39208.87
1/15	SPY(p)	Sell	0.41	20	765.01	-18969.98	249510.84	20238.89
1/15	BABA(c)	Sell	4.75	6	2819.51	-8130.98	252330.35	12107.91
1/15	AAPL(c)	Sell	0.01	20	-34.99	-9589.98	252295.36	2517.93

6.7 Week 7

In week 7 Alibaba seemed to begin to rise from the 20-day dip that had occurred in December. Because of our initial belief from the last two weeks concerning the BABA stock had been incorrect, we predicted that the value of Alibaba's stock would once again fall below the blue line (or $252) as show in Figure 6.7.1 below. In response to this, we purchased 10 put contracts which cost $4.80 each for a total premium of $19,289.99 to be paid. Shortly after the contract had been purchased, it was noticed that we forgot to pay attention to the expiration date of the option which came within 4 days of the purchase, not allowing enough time to let Alibaba fall in value. After waiting until the expiration date, the value of BABA continued to rise, making the contracts held worthless. Because we did not want to make the same mistake that we made with apple in the previous week, when selling the contracts resulted in us needing to pay, we let the contract expire meaning that money was only lost from this trade.

Figure 6.7.1. Graph of the value of BABA per day from October until January 18th (with the x axis representing day and the y representing USD value), showing how BABA stock is climbing after a long decline.

Figure 6.7.2. Graph of the value of NFLX per day from November up until January 20th (with the x axis representing day and the y representing USD value), showing how NFLX stock had dramatically shot up in value.

During the 7th week on January 20'th, Netflix had a significant growth spike in value, which seemed to be both unexpected and potentially unstable. The reason one may say that the rapid jump is unstable is due to how much the value of Netflix's stock grew within a day with next to no buildup. As we can see in Figure 6.7.2, within a single day NFLX shot up from a little over $500 all the way up to $586.34, leading us to believe that the stock would dramatically dip back down. In this case, we had purchased 1 put contract valued at $194.30, costing a total of $19451.74.

Table 6.7.1. Represents the trading history for Week Seven, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.7.1: Transactions Week Seven

Date	Symbol	Buy /Sell	Price	Contracts	Net Cost/ Proceeds	Profit / Loss	Total Cash	Total Profit
1/18	BABA(p)	Buy	4.80	10	-19289.99		233005.37	2517.93
1/20	NFLX(p)	Buy	194.30	1	-19451.74		213553.63	2517.93
1/22	BABA(p)	Exp	0	10	0	-19289.99	213553.63	-16772.06

6.8 Week 8

Week 8 had proved itself to be a profitable week of trading where we had learned how to tame our thirst for more return on investment and come out of a trade with extra money in our pockets. There had been 3 trades which had occurred with Netflix options during the week. First, we had sold our single put from the prior week of trading. We were able to do so for $838.26 in profit which was significantly less than what we had hoped for. Now that the market had been open, we searched for new put contracts which could provide us with more profit than before, due to a different strike price and more contracts. During this new trade, NLFX had continued to fall thus we purchased 5 new put contracts for $25.10 each. After just 3 days, our contracts had appreciated and they were able to be sold for $34.30 each, coming to a total of $17,121.26 providing us with $4,467.52 in profit.

Figure 6.8.1 Graph of the value of NFLX per day from October up until January 25th (with the x axis representing day and the y representing USD value), showing how NFLX shot up and is now on a steep decline.

Another trade made during the week is the purchase of 10 Apple put contracts for a total of $5437.49. As shown in Figure 6.22 below, the value of AAPL was beginning to fall heavily as of the 23rd of January. In order to capitalize on the drastic fall, the 10 options had been purchased and within the next day we were able to sell them for more than double the price we had initially paid. From the Apple trades, we had made $5725.02. As a result of the two trades made this week, we were able to minimize our total losses down to $5,888.83 from what had once been $59,654.74.

Figure 6.8.2 Graph of the value of AAPL per day from October up until January 29th (with the x axis representing day and the y representing USD value), showing how AAPL stock is continuing to fall after its growth in value.

Table 6.8.1. Represents the trading history for Week Eight, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.8.1: Transactions Week Eight

Date	Symbol Call(c)/ Put(p)	Buy/ Sell	Price	Contracts	Net Cost/ Proceeds	Profit / Loss	Total Cash	Total Profit
1/25	NFLX(p)	Sell	202.68	1	20290	838.26	233843.63	-15933.8
1/25	NFLX(p)	Buy	25.10	5	12653.74		221264.89	-15933.8
1/28	NFLX(p)	Sell	34.30	5	17121.26	4467.52	238386.15	-11466.28
1/28	AAPL(p)	Buy	5.40	10	5437.49		232948.66	-11466.28
1/29	AAPL(p)	Sell	11.20	10	11162.51	5725.02	244111.17	-5741.26

6.9 Week 9

In our 9th week of trading, our main goal is to recover previous losses from failed predictions. During this week, Microsoft seemed to be the only appealing stock, as it seemed to be reaching a peak value (seen in Figure 6.9.1), which means that there is potential for great profit if we bought puts and waited for MSFT to fall in value. In order to capitalize on this, we bought multiple sets of put contracts for Microsoft. For one set, it cost a total of $14,854.99 for 20 contracts which were $7.40 each. Next, only a single MSFT put contract was purchased for a total of $1,146.74, meaning we spent a total of $16,001.73 on Microsoft puts.

Figure 6.9.1 Graph of the value of MSFT per day from October up until February 2nd (with the x axis representing day and the y representing USD value), showing how MSFT stock has grown and reached a peak value.

Table 6.9.1. Represents the trading history for Week Nine, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.9.1: Transactions Week Nine

Date	Symbol Call(c)/ Put(p)	Buy/Sell	Price	Contracts	Net Cost / Proceeds	Profit / Loss	Total Cash	Total Profit
2/2	MSFT(p)	Buy	11.25	1	1146.74		242964.43	-5741.26
2/2	MSFT(p)	Buy	7.40	20	14854.99		228109.44	-5741.26

6.10 Week 10

During the 10th and final week of trading, our total losses had increased as Microsoft's stock had behaved unlike, we had predicted. Rather than falling in value, we can see in Figure 6.10.1 that MSFT stayed rather stable at its high point as it only increased by about a dollar. As Friday the 12th was the expiration date our contracts, it was time to sell. Due to its stability in value and because we had bought multiple put contracts in the previous week, we had lost (enter amount here). Although the stock had not yet fallen, we believe that it will begin to do so over the upcoming week.

Figure 6.10.1 Graph of the value of MSFT per day from December up until February 12th (with the x axis representing day and the y representing USD value), showing how MSFT stock has remained at around $244 when we predicted it would fall.

Table 6.10.1. Represents the trading history for Week Ten, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Table 6.10.1: Transactions Week Ten

Date	Symbol Call(c)/ Put(p)	Buy/ Sell	Price	Contracts	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
2/12	MSFT(p)	Sell	6.45	1	623.26	-523.48	228732.7	-6412.31
2/12	MSFT(p)	Sell	1.97	20	3885.06	-10969.93	232617.76	-17382.24

6.11 Simulation Results

As of Friday, February 13 our trading simulation had come to an end. After 10 weeks of continuous analysis of our 10 stocks behavior and investing as we had predicted to be most profitable, our trading had resulted in a net loss while using only the technical trading style. When trading over the course of the 10 weeks, we had based our decisions solely on the data representing the activity of a stock's value. When doing so, we were analyzing trends, high points, low points, and applying our best judgement to determine the benefit of purchasing an option for a given stock.

Over the course of 10 weeks, we would have weeks in which we ended with profit, some with no gain or loss and others with significant loss, however in the end, we had lost a total of $17,382.24 or 6.95% of our initial amount of cash for the simulation. Why had we resulted in such a loss when the tools for technical analysis had been used? The most reasonable explanation is that there are a multitude of patterns that a stock can follow, and those patterns can change at any given moment. As we could see throughout the simulation, we would often times have a stock follow a particular trend as we had predicted, whether it had done so for days or even a few minutes, but then it would fall out of the trend sooner than we had predicted or follow one for even longer. When this happened, it seemed to occur for all stocks in a given week, meaning that the stocks moved proportionally. We can see this in table 6.11.1 below, where if we were to look at each week of trading as a group, the collection of trades for the given week had often all followed the same direction, as they were all or the majority of them were gains or losses.

Table 6.11.1. Represents the trading history for all weeks of trading, showing what was bought or sold, when the transaction occurred, quantity bought or sold, losses or gains and the current cash balance. The price of an option is equal to the premium multiplied by 100 plus commission.

Date	Symbol Call(c)/ Put(p)	Buy /Sell	Price	Contracts	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
12/7							250000	
12/8	SPY(c)	Buy	3.84	40	15449.99		234550.01	
12/9	SPY(c)	Sell	6.48	40	25910.01	10460.02	260460.02	10460.02
12/11	FB(c)	Buy	11.98	10	11987.49		248472.53	10460.02
12/15	BABA(c)	Buy	18.20	6	-10950.49		237522.04	10462.02
12/23	FB(c)	Sell	3.36	10	3362.51	-8624.98	240884.55	1837.04
12/28	SPY(p)	Buy	9.84	20	-19734.99		220929.56	1837.04
12/29	AAPL(c)	Buy	4.75	20	-9554.99		211374.57	1837.04
1/6	SHOP(c)	Buy	42.00	5	-21028.74		190345.26	1837.04
1/11	SHOP(c)	Sell	116.80	5	58400.57	37371.83	248745.83	39208.87
1/15	SPY(p)	Sell	0.41	20	765.01	-18969.98	249510.84	20238.89
1/15	BABA(c)	Sell	4.75	6	2819.51	-8130.98	252330.35	12107.91
1/15	AAPL(c)	Sell	0.01	20	-34.99	-9589.98	252295.36	2517.93
1/18	BABA(p)	Buy	4.80	10	-19289.99		233005.37	2517.93
1/20	NFLX(p)	Buy	194.30	1	-19451.74		213553.63	2517.93
1/22	BABA(p)	Exp	0	10	0	-19289.99	213553.63	-16772.06
1/25	NFLX(p)	Sell	202.68	1	20290	838.26	233843.63	-15933.8
1/25	NFLX(p)	Buy	25.10	5	12653.74		221264.89	-15933.8
1/28	NFLX(p)	Sell	34.30	5	17121.26	4467.52	238386.15	-11466.28
1/28	AAPL(p)	Buy	5.40	10	5437.49		232948.66	-11466.28
1/29	AAPL(p)	Sell	11.20	10	11162.51	5725.02	244111.17	-5741.26
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2/2	MSFT(p)	Buy	7.40	20	14854.99		228109.44	-5741.26
2/12	MSFT(p)	Sell	6.45	1	623.26	-523.48	228732.7	-6412.31
2/12	MSFT(p)	Sell	1.97	20	3885.06	-10969.93	232617.76	-17382.24

7. Analysis and Comparison

Over the course of our 10-week trading simulation, the fundamental trading style had profited $1101.68 while using the technical trading style had resulted in a loss of $17382.24. After our simulation, we have concluded 3 key differences between the two types of trading. The first significant difference between technical and fundamental trading is the number of trading opportunities. Throughout our period of trading, it had been apparent that the fundamental trading style provides significantly less trading opportunities than that of the technical trading style. The primary reason for this is because there is not always major news being released on companies that are on the watchlist and without any news as a catalyst then no trades would be taken.

Another prominent difference between the two trading styles is that technical trading can give you an opportunity to buy low and sell high and catch more of a move. The reason for this is because while a fundamental trader without technical analysis may enter in the middle of a move or too early, technical traders would have seen an entry opportunity earlier using tools such as trendlines, support/resistance, and price action to catch a bigger chunk of the move an avoid drawdown.

The most impactful difference between fundamental and technical trading had been that the usage of fundamental trading can help avoid bad trades. The extra information that fundamental trading analysis provides via new, and information had been a heavily influential part when we had been implementing the fundamental trading style. Unlike technical trading, the information which could be obtained was used as guidance as it could potentially provide you with the correct direction of the market if the news in interpreted correctly. One example of this throughout the simulation was the trading of FB or Facebook. While Facebook had been completely avoided by

the fundamental analysis trader, the technical trader found an upwards trend and decided to buy calls. The issue with buying call contracts during this time is that Facebook had recently been involved in a lawsuit, and that soon reflected in the stock's value, as it began to fall as news had spread. If the technical trader had been using fundamental analysis during this time, trades involving Facebook could have been avoided, as the stock proved to be unstable for the duration of the trading simulation.

8. Conclusion

Our IQP was based off a 10-week trading simulation using Investopedia's trading simulator. The IQP had built upon the knowledge we had gained through background research of the stock market and options. The market was quite unstable/irregular during our time of trading due to the COVID pandemic. Most of the stocks we were watching during our simulation were consolidating (price moving back and forth within a price range) which made it more difficult to find good trades. After the simulation reviewing the results of our simulation, we found that a combination of both fundamental analysis and technical analysis would be the best strategy for trading in the stock market. This Interactive Qualification Project had provided the team with a beneficial experience trading in the stock market which provided a strong foundation to kickstart trading in the real world. With the new techniques, knowledge and experience gained from this project, we as a team can confidently begin investing in the stock market.

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