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# Stock Market Simulation

Binh Quang Phan  
*Worcester Polytechnic Institute*

Duong Nguyen  
*Worcester Polytechnic Institute*

Hoang P. Nguyen  
*Worcester Polytechnic Institute*

Khuyen Thi Ha Cao  
*Worcester Polytechnic Institute*

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Degree of Bachelor of Science

By

Binh Phan \_\_\_\_\_

Duong Nguyen \_\_\_\_\_

Hoang Nguyen \_\_\_\_\_

Khuyen Cao \_\_\_\_\_

Submitted:

Approved by Professor Dalin Tang, Project Advisor

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## **Abstract**

The objective of this Interactive Qualifying Project was to learn stock market's different investment strategies in order to maximize profit. Four simulations were conducted over the course of 10 weeks with different strategies: hybrid long-term dividend stock, swing trading, day trading and penny stock trading. Because a variety of strategies were chosen, total of ten companies were listed for the hybrid long term, swing trading and day trading, while penny stock trading used six different companies. Due to the differences in investment style, penny stock traded on OTCQB, OTCQX and NASDAQ markets whereas the other simulations used NASDAQ stock exchange only for trading. This project period happened during the United States President Election which affected the stock market greatly. Overall, all simulations were successful with 5% - 10% profits over the 10-week simulation period. The four simulations were compared and analyzed to determine the most effective strategy. The knowledge, simulation's data of the stock market and different strategies method acquired during this project are very helpful towards making future investments' decisions.

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# **1. Introduction**

## ***1.1. Goal***

The goal of this IQP project is to understand the fundamental knowledge of stock market, practice some basic strategies in a short-term stock market investment and hopefully gain enough experience for investing in stock for the future. The project will start by researching basic knowledge about stock market, terminologies of investing options, getting familiar with stock graphs and charts and different techniques of trading in the market. Then the team will choose ten potential companies to focus on. Each team member will start with \$200,000 and individually pick his or her strategy of trading stock. The simulation will last for ten weeks. Each week, team member will record details his or her trading deals through graphs and charts, analyze the recorded statistics and give comments on decisions made over that week. After ten weeks, team members will come together to share and compare their results and further examine those chosen strategies and decisions to find what strategies is the most succeeded.

In conclusion, after this IQP project, team members should develop a better understanding about stocks, get a hold of efficient trading techniques and gain a thorough experience of today's stock market. As a result, the team should be able to use the knowledge they have learned to apply to future investments.

## ***1.2. History of Stock Market***

### ***1.2.1. Early concepts of stock markets (11th – 13th century)***

The first example of brokerage that we can see dates back to the 1100s, where the French formed a system to manage their debts (mostly agricultural at this point) throughout the country in place of banks.

Two centuries later, the merchants of Venice were the first people in the history to start trading government securities. Following the trends, merchants in other cities of Italy began trading, with their job very much similar to what stock brokers do nowadays.

### ***1.2.2. The first stock market (15th century)***

Belgium formed the world's first stock market in Antwerp approximately around 1531 and soon afterwards, the Netherlands also hosted their stock markets in major cities. However, there were no real stocks (shares of companies) being traded. Instead, people would meet there to deal with government, business and personal debts issue, forming business partnership that generates extra income which resemblance modern day stocks and bonds.

### ***1.2.3. The East India Company (1602)***

The main method for trading goods in the 16<sup>th</sup> century is through voyage, although the condition for this type of transportation is very risky (pirates, common weather, navigation errors ...). Upon seeing this, investors spread their money to invest in shares of multiples voyage to reduce the risks of losing their income. The East India Company (VOC) established the first formal, publicly trading market for printed stocks and bonds. The company will pay investors

dividends to all voyages that the company managed, instead of each separate voyage, thus reducing even further the risks for shareholders.

#### 1.2.4. Trading in coffee shops

Due to the fact that there were no official trading floors in these early days, the most popular place for trading stocks were in coffee shops. At this point, shares of various companies are hand-written piece of papers, which investors would bring to coffee shops to sell or buy.

#### 1.2.5. Official modern stock exchange (the 18<sup>th</sup> century)

Back in these days, the concept of stock market, company shares, bonds or other terminologies were extremely blurry; the government did not provide clear regulations and laws; and people did not have the chance to access reliable information about the companies that issued stocks. As a consequence, investors could not distinguish between legitimate and illegitimate companies, leading to the first stock market bubble burst (the South Sea Burst) when these companies failed to pay any dividends to investors. This caused the ban of issuing shares until 1825.

In spite of the difficult time, London Stock Exchange were officially formed in 1773 but were greatly limited by the government law restricting shares. This idea of stock exchange spread quickly to the U.S., resulting in the birth of New York Stock Exchange (NYSE), the top stock market in the world nowadays.

#### 1.2.6. The formation of American stock markets

The first stock exchange in USA was actually in Philadelphia in 1790 but it was not until 1792 did the most powerful and popular stock market, the New York Stock Exchange (NYSE)

was founded. On May 17<sup>th</sup>, 1792, twenty-four leading brokers of New York came together and signed the Buttonwood Agreement outside 68 Wall St, New York. These men had founded what will develop into the NYSE. The Exchange quickly became the business center for the majority of coming and going trades in the US and internationally, with hardly any domestic competition for decades. Today, the NYSE is the stock market with the highest market capitalization worldwide.

### *1.2.7. Modern stock markets*

The youngest and most potential competitor for New York Stock Exchange is NASDAQ, founded in 1971 by the National Association of Securities Dealers (NASD) - now called the Financial Industry Regulatory Authority (FINRA). Unlike other stock markets, NASDAQ provides a new type of stock exchange. NASDAQ does not have a physical location but is a network of computers used to execute all trades electronically, which allowed exchanges to be even more efficient and reduced the bid-ask spread.

Currently, Table 1.1 gives the top 10 stock markets in term of market capitalization in the world (updated 2016).

Rank	Exchange	Economy	Market Capitalization (USD billions)
1	New York Stock Exchange	USA	19 223
2	NASDAQ	USA	6 831
3	London Stock Exchange	UK + Italy	6 187
4	Tokyo Stock Exchange	Japan	4 485
5	Shanghai Stock Exchange	China	3 986
6	Hong Kong Stock Exchange	Hong Kong	3 325
7	Euronext	European Union	3 321
8	Shenzhen Stock Exchange	China	2 285
9	Toronto Stock Exchange	Canada	1 939
10	Deutsche Borse	Germany	1 762

*Table 1.1 Stock markets in the world*

### 1.2.8. Major market crashes in the history

Throughout the course of stock market history, there were some infamous market crashes and financial crisis that damaged the economy heavily. Here are some of the top stock market crashes until today:

- The South Sea Bubble in 1711 (United Kingdom)
- The Florida Estate Craze in 1926 (USA)
- The Stock Market Crash of 1929 (The Great Depression - USA)
- Black Monday – the Stock Market Crash of 1987 (USA)
- The Asian Crisis: Japan’s Bubble Economy of 1980s (South East Asia, mostly Japan)
- The Dot-com Bubble in 2000 – 2002 (USA- Silicon Valley)

- Housing Bubble and Credit Crisis in 2007-2009 (USA and UK)

### ***1.3. Risk and Payoff of Investing***

So why investing in stock market, why people invest millions and billions of dollars into it? It is simple, because stock can multiply that number by a lot, investor could double their investment in couple of days. However, many investors bankrupted in just a few days. In this chapter, we would explain why stock market price change, the risk and payoff of stock investment.

#### ***1.3.1. Stock price – Supply and Demand principle***

In economic, everyone knows about supply and demand principle. It is very simple. When more people want product A rather than sell it, the price of product A will move up. However, stock is not just a product, it is, by definition, stock is ownership of an organization. Therefore, if more people think the company will do well rather than dislike that company, the price of the stock will move up. The principle of supply and demand is not difficult to understand. However, what makes stocks so interesting and challenging is that why people likes some particular stock than others, what is the trend of people, will this stock be bought a lot or, which stock people are trying to sell. Investing in stock market is not only just data, numbers and graph, it is an art.

Not only based on the supply and demand principle, stock price is also affected by many other factors. By its principle theory, “the price movement of a stock indicates what investors feel a company is worth” (Investopedia). One of the most important factor that affects company’s values is its earnings, if the company is making positive profit more than expected, people who had their stock will be earning money too because more investor will go buy that



company's stock. However, if the company is not doing well, it is not making any money, the company will shut down soon, no one will buy the company stock. Therefore, there are strong correlation between profit of a company and its stock price.

However, what the company's worth is not only how much value the company has currently, but also the potential development of a company, how well the company will success in the future. No investor knows if the company will do well or not, but they could research its current CEO, plans of the company. If the company has great plan in the future, and if investors think it could potential to grow, more people will try to buy them, its stock price will go up. But the future is the future, nobody knows what will happen.

Moreover, stock price of a company could change for external reason such as the economics of the company, some new laws and legacy. What if the company was doing well for many years, lots of investors are buying stock from them, then a foreigner company which same type of products came along and share the profit, what if the economics crashed, what if a hurricane came and damage the company's factory and reduce its earnings.

In conclusion, returning to the question, why people likes some stock and buy them than others, how can we predict what people will buy and sell, what is the trend of the market, no one can know the answer for sure, some people predict with graph and charts to choose when to buy and sell stocks, some do research and see the potential of the company to pick the right stock or some people think it is just luck and fate, but everyone knows that stock price can change very rapidly. This means two things, first is that investors can make lots of money in short amount of time without working, which is the main reason they invest, second is that there are lots of unpredictable risks that investor would face due to the volatile character of stock.

When investing in any area, there are risks so is it for the stock investment. But differ from business, stock market is affected by everything that goes on in the world. There are different types of risk but only one pay off. Either investor makes profit or loses money for a limited controllable amount.

### *1.3.2. Type of risk*

Commodity price risk: This is the risk when inputs (raw material) for production line fall in its price. Raw material includes oil, steal, sugar, etc.

Headline risk: This is the risk of media damaging a company's business

Rating risk: This is affected by the business's credit rating. The credit rating directly affect the business on how it will finance.

Detection risk: When you hide something behind your back. It has the potential that people will find out. This works the same for company when authority involves to investigate. If they find out a business is skimming money out for example, the reputation of the business will be greatly damaged and difficult to recover.

Legislative risk: This depends on how close the business to the government. If the business has good relationship with the government, it is likely that the government will help in the growth of the business. This includes new regulation, taxes, etc.

Inflationary risk: During the time of inflation, inputs price can rise up high, this will negatively affect the business in getting inputs cost and output price. Leading the business to face high interest rate.

### *1.3.3. Risk/Reward ratio*

There are several tools to analyze in stock market. Here we take 1 tool and it is the risk/reward ratio. Investors use this as a method to compare expected return to the amount of risk of an investment. The risk here is when stocks drop price unexpectedly based on the amount an investor willing to lose. In many cases, the ideal for the ratio is one third (1:3). From this tool, in which, the amount of money an investor willing to lose leads us to a method to minimize the amount of loss. It's the stop-loss order, the information was taken from [1]. Stop-loss order is often used by individual stock investors. I limited the amount of loss of an investor in a controllable way.

For example, stock graph goes up and down every day just like a mixture of sin, cos, tan graph. The stock value is \$50 at the trading time when the investor traded. The investor also sets the stop-loss order to be \$40. Therefore, when the stock value drops to \$30, the investor only loses \$10 instead of \$20 because when the stock value dropped to \$40 boundary, the system sells his stock. Because stock market is unpredictable sometimes, this method only minimizes the loss, if the investor takes the risk (also called Risk Lover), and the stock value goes up after it drops then he wouldn't use this method.

## ***1.4. Terminologies***

### *1.4.1. Stock*

A corporation is a company or a group of people authorized to act as a single entity and recognized as such in law. Stock is the ownership of a corporation indicated by shares, which represent a piece of the corporation's asset and earnings.

Since it represents the ownership of a corporation, stock's price is affected by its corporation's performance, such as income, future plans, media publications, internal changes. For instance, when Pokemon GO was beta launched by Nintendo, their stock price sky rockets. Another example is the accident involving the Tesla's Autopilot mode of operation, which results in a brief dive in the company's stock price.

#### *1.4.2. Dividend stock*

Dividend stock is a special type of stock that the holder gets paid a portion of the company's earning for every held share. Most companies will pay dividends four times a year. For example, let's say Company X pays an annualized dividend of 20 cents per share. The company will send a check of 20 cents (5 cents) for each share held.

Dividend stock should be considered as a long term investment. Unlike regular stock trading, dividend stock is not a quick way to make money, and is also a very stable way to get paid. However, with the right distribution between dividend stock and regular stock, the holder can develop a very lucrative and stable strategy.

#### *1.4.3. Earnings per share*

Earnings per share (EPS) is the portion of company's profit allocated to each outstanding share of common stock. EPS serve as an indicator of a company's profitability. The EPS is calculated as:

$$\frac{\text{Net Income} - \text{Dividends on Preferred Stock}}{\text{Average Outstanding Shares}} \quad (1)$$

For example, assume that a company has a net income of \$25 million. If the company pays out \$1 million in preferred dividends and has 10 million shares for half of the year and 15 million shares for the other half, the EPS would be \$1.92 ( $24/1.25$ ).

Basically, the price of stock is directly affected by the EPS. Stockholders usually buy or sell their shares based on the EPS changes or prediction to make profit.

#### *1.4.4. Bonds*

Bond is a debt investment in which an investor loans money to an entity (typically corporate or governmental) which borrows the funds for a defined period of time at a variable or fixed interest rate. Bonds are used by companies to raise money and finance a variety of projects and activities.

When companies or other entities need to raise money to finance new projects, maintain ongoing operations, or refinance other debts, they may issue bonds directly to investors instead of obtaining loans from a bank. The investors issue a bond that contractually states the interest rate that will be paid and the time at which the bond must be returned.

#### *1.4.5. Mutual fund*

Mutual fund is an investment vehicle made up of a pool of funds collected from many investors for the purpose of investing in securities such as stocks, bonds, money market instruments and similar assets. Mutual funds are operated by money manager, who invest the fund's capital and attempt to produce capital gains and income for the fund's investors.

One of the main advantages of mutual funds is they give small investors access to professionally managed, bonds, and other securities. Each shareholder, therefore, participates

proportionally in the gain or loss of the fund. Mutual funds invest in a wide amount of securities, and performance is usually tracked as the change in total market cap of the fund, derived by aggregating performance of the underlying investments.

Since mutual fund offers a lot of advantages, the investor purchasing shares in a mutual fund is usually assessed a fee known as an expense ratio. A fund's expense ratio is the summation of its advisory fee or management fee and its administration costs.

## **2. Strategies**

### ***2.1. Chapter Overview***

This Chapter discusses many different types of trading strategies for stock market such as short-term, long-term, dividend stock and penny stock trading. Each strategy will be analyzed for its distinguished characteristics, benefits and risks. Then four strategies will be chosen by each member of the team to perform simulation for this project.

### ***2.2. Short-term Investment***

Short-term trading is one of the most common trading techniques for stock market investors. People who choose this trading technique are usually called “trader” while the ones who choose long-term trading are referred to as “buy-and-hold investors”. As the name of this technique speaks itself, short-term investment is the techniques when the investors usually enter and exit the stock market within just as little as a few minutes and up to a few days maximum.

In order to be successful in short-term stock investment, the trader needs to stay on top of the current events and have a certain understanding of the stock market. This can be a dangerous path to choose for new traders because you need to be able to quickly spot good opportunity, capture the right small movements in the market and also avoid unpredictable events that happen within a short period of time.

There are two main techniques for short term investment: day-trading and swing trading.

### *2.2.1. Day trading:*

In the case of “day trading”, the traders’ duration between buying in and selling out is in range of one single trading day. This is a highly debatable technique, many believe that this is to gain a good amount of profit in a short period of time and promoted this as a “get-rich quick” scheme. However, others argue that even with the short term profit, this still does not justify for the high risks that traders take, especially due to the inconsistent nature of the stock market. Day trading is suitable for people who are decisive, risk-loving and are able to stick to a clear disciplinary plan to exit the market at the right moment and avoid emotions, such as fear or greed to affect their decision and cause serious losses.

### *2.2.2. Swing trading:*

Opposite of “day trading”, “Swing trading” traders’ duration could be days to several weeks. Swing trading also involves the trader to hold a position at least overnight, which is the main different from day trading. Swing traders use the fundamental of short-term price momentum and technical analysis using multi-day chart patterns especially candlestick graph. This method mainly involves traders investing stocks that has extraordinary moving potential, to make money during a “swing” of stocks. During an uptrend or even a downtrend, “swing” trader can still make profit. “Swing trading” is suitable for the beginning trader to get a better understand about the stock market while still made a significant profit for intermediate and advanced trader.



### ***2.3. Long-term Investment***

The name of this investment strategy just gives itself out. Basically, any stock traders buy some stocks, then hold them for some time, more than some days of course, and sell them when the price increases for profit.

Now how long can be considered “long-term”? In the stock market, bigger, more established companies tend to have a more constant growth rate over the year, but also a very slow growth rate. On the contrary, smaller companies, startups for instance, tend to possess more unstable growth rate, which also means more opportunities for investment. In other word, the longer the holder has to wait, the lower the risk and vice versa. However, for the sake of this simulation, which only lasts for a maximum of 12-week, far insufficient amount of time to actually do any longer than monthly trading, a long-term of more than several days to maybe a maximum of one week will be considered.

The strength of long-term investment lies in the amount of data it provided for the asset manager: since the time period of this strategy is very long, the stock holder can gather a lot of accurate data from reading the past daily/weekly closed price. From those data, one can generate a trend plot and then visually decided whether he should buy or sell the stock. Moreover, with a little help from an automated algorithm, the data can be calculated to show signs of buying or selling a specified stock.

## 2.4. Dividend Stock

Dividend stock is a special type of stock that the holder will get paid annually just by owning the shares. This is a very safe approach to grow one's asset. However, safety comes with a price: the return of investment rate is not high. In other word, this is a low-risk low-reward approach, which makes sense because nobody wants to do things the easy way now, would they.

Speaking of low-reward, how exactly "low" is this approach yield? With the help of the Internet, one can easily verify this information by a click of the mouse. At the current time, the company with highest dividend stock yielded is Ennis, Inc. (EBF), a commercial printing company, the information was obtained from [2]. The actual EPS of EBF is currently \$1.29, with each share currently at \$16.38, the information was obtained from [3]. Now, using some simple math, the dividend yield is

$$\frac{EPS}{Stock\ price} \times 100\% = \frac{\$1.29}{\$16.38} \times 100\% = 7.88\% \quad (2)$$

What does this number 7.88% mean? This number can be considered as a variable bank's annual interest rate. Why is this rate variable? Because it can be changed over time depends on the company's performance. Still, this interest rate is still very tempting, considering most of the bank's interest rate. However, some people can gain as much as 15% return of investment with day-trading strategy, the information was obtained from [4].

So is holding dividend stock a wise strategy? Well it depends. Considering time is money, it will take a very long time for the holder to actual make some actual profit, which would certainly not worth the overall time spent. However, if dividend stocks were used to trade and

create a sort of constant income so the holder can expand his other investments, it might worth the try.

## ***2.5. Penny Stock Trading***

In order to understand this technique, we first need to understand, what is penny stock? Penny stock, which is a type of Over the Counter (OTC) stock, is the name for any low priced, small cap stocks, usually any stock that is under \$5 per share. Most of the time, stocks referred to as “penny stock” are not available in big market exchanges such as NYSE or NASDAQ. Instead, investors can buy penny stock through listing services, such as Over the Counter Bulletin Board (OTCBB) or Pink Sheets. Pink Sheets are daily publication that provides investors with information about OTC stocks. Companies registered on the Pink Sheets does not need to meet the minimum requirement with the SEC, making it a lot more dangerous than stocks on big exchanges. OTCBB, however, does have some certain qualification requirement, although less strict than exchanges’, which make it slightly less risky and legitimate.

Upon seeing how dangerous penny stock can be, why do people still investing in this techniques? The answer is, the higher the risks, the higher the rewards. Penny Stock trading is one of the most profitable techniques in a short period of time.

For example, Table 2.1 is the report of the advancers stocks in a closing summary of the day for OTC Markets.

Symbol	Price	% Chg	\$ Volume	Share Vol	Trades
 <u>ABVN</u>	2.00	900.00	800	400	4
 <u>BCWG</u>	1.01	405.00	8,484	8,400	7
 <u>HRKCW</u>	1.05	320.00	215	205	2
 <u>TRHF</u>	6.00	200.00	1,200	200	2
 <u>ESSI</u>	1.35	50.00	1,409,388	1,043,991	951
 <u>NXCN</u>	7.00	40.00	2,163	309	5
 <u>TEUCF</u>	4.00	37.93	400	100	1
 <u>ITUP</u>	36.00	31.10	5,040	140	2
 <u>FNFI</u>	12.00	29.03	3,648	304	5
 <u>AATV</u>	2.10	27.27	1,890	900	6

*Table 2.1 Advancers stocks in a closing summary for OTC Markets*

Looking at this table, we can see that the highest percent increase for a penny stock can be up to 900 percent in a single day, which is almost impossible for bigger stocks in large exchanges. This incredibly high volatility is the main attraction for people to keep investing in penny stock despite such high risks of scamming.

When looking into different stocks to invest, traders usually focus on two factors: volatility and liquidity. Volatility is the measure of standard deviation of a trading stock's price over a period of time, or basically variation in the price over time. Liquidity is how quickly a stock can be converted to cash, or how quickly you can sell your stock. Penny stock has high volatility and low liquidity. Due to the fact that penny stock is extremely susceptible to fluctuation, it can offer great growth potential with luck. Because of the small size of these penny stock companies, there is not a lot of variables and complexity, making it a good technique to choose for beginners. However, also because the small size of these penny stock companies, the trading volumes are pretty low and it means that it may be more difficult for you to sell your penny stocks. Therefore, investors should do deep analysis on the companies from which they are buying, to avoid unscrupulous companies, scammers and frauds with the "pump and dump" type of stock sales.

## ***2.6. Position Trading***

This type of trade can be applied for both long-term trading and short-term trading depends on the trader. In this type of trade, trader looks for the trend of the stock either on the chart or on the graph. In position trading, trader aims to make profit from both on the uptrend and downtrend of the market. There are two sub types of trading in position trading.

The main key between long position trading and short position trading is that in long position trading, trader owns his commodities whereas short position trader borrows stocks with expectation to sell them with a higher price and then repurchase with a lower price.

The first type is long position. Trader will hold the stock until he sees that the stock has reached its peak on the trend graph.

If the trend is going up and the trader thinks it will continue to grow in trend, he will hold the stock for days, weeks to months. Or when the trend is going down but he sees that the trend will go up again, he will buy the stock and hold it until he makes profit or he sees that the trend is about to go down, he will sell the stocks at this moment. This strategy aims for uptrend of the market.

The second type is short position, because trader has to pay interest to broker, trading will happen faster than in long position trading.

In short position, trader has no ownership on the commodities and has to pay interest when borrowed stocks. He will see for downtrend of the market. If he sees that the trends will go down, he will sell the stocks at their current value and then repurchase them with a lower price,

then he returns the stocks to the brokerage firms. The amount of currency he has when he sells the stocks minus the interest and the price he pays to repurchase the stocks is his profit.

## ***2.7. Conclusion***

In conclusion, there are lots of different trading strategies in stock market. Each strategy has its own benefits and risks; each strategy is suitable for different type of traders. In this stock market simulation project, each team members will choose his or her strategy of trading stocks and simulate the stock market for 10 weeks. At the end of the 10 weeks, our team will compare each method, analyze what individual could do better, to gain more experience and produce a mixed strategy that will make the most profit to the traders.

One strategy of trading worth mentioning is the dividend stock investment strategy. Even though this approach takes up a lot of time, it gives back constant profit over time. This is a very safe strategy for gradually expanding any asset. Furthermore, with the correct investment, the dividend stock strategy can be combined with other trading techniques to maximize the profit with minimum loss. Considering the fact that dividend stock is a long-term investment, and also can be traded as regular stock as well, this strategy would blend very well with the long-term stock investment. Firstly, both strategies required long-term information gathering for stock trading. Secondly, the constant profit from dividend stocks can make up for the loss of other normal stocks, if distributed strategically. The only problem remains is how to distribute one's asset between normal and dividend stock so they can make the most out of the situation. This problem should be solvable with the help of probability and statistic. Again information, specifically the companies' performance in the past, plays a very important factor. Therefore,

this method of investment shall be called the hybrid long-term dividend stock investment and considered for future simulation.

Contrary to the safe quality of long-term dividend stock investment strategy, penny stock trading is a method that brings very high profits but is considered to be the riskiest. This may not be a strategy that you want to invest in your lifetime savings due to its gamble like nature. However, this method is great to experiment with a small sum of money with hope that it might bring big return in a short period of time. From penny stock trading, you can learn the skill to do extensive research on different companies and brokerage options to find yourself the most potential yet reliable stocks. For example, instead of just looking at a company's stocks, investors must take a look into the company's underlying business, quality of the financial statements, person who auditing the firm, to ensure that the companies are sustainable, trustworthy cooperation. Apart from the normal buying and trading option in the big exchanges, OTC stocks trading force investors to familiarize themselves with multiple niche techniques such as "short sell" or "buy to cover". Also, because the price per share of penny stocks is fairly cheap and share volumes for some firms are quite low, this is the only chance for small investors to play in a big position and really influence the price of a certain stock. In conclusion, penny stock trading might not be the best and safest way to invest your future assets, but is an interesting trading technique for a simulation as it really helps train your mindset and frame a sharp plan which you can use in even other methods of stock trading.

So how traders make money with stock? It is simple; their selling price is higher than their buying price. So mathematically anytime price of stock increase, there will be potential profit for the traders. Day trading can be one of the fastest money making method, however because the risk of falling is also high that sometimes this strategy is not worth for the reward. But if the

traders have experience with stocks, time of the day that stock will go up or down, buying it while at the stock low, selling it at the stock high during the day, they can instantly make money no matter the trend of the market is whether it is uptrend or downtrend. The percentage of total money trader gain from each day is not a lot, however, they would use high volumes of money. Either way, they could gain money fast but at the same time potential lost lots of money. This trading method is one of the most difficult method to use, therefore one of the most interesting trading method to research and apply.

Therefore, the chosen strategies for the ongoing simulation will be: hybrid long-term dividend stock investment, penny stock trading, day trading, and swing trading.



## 3. Hybrid Long-term Dividend Stock Investment

### 3.1. Simulation Goal

As discussed, long-term stock investment is meant to be invested for a long period of time, say years, and so is the dividend stock strategy.

The average annual growth rate of a stock is about 27 percent, the information was obtained from [5]. On the other hand, the annual growth rate of the chosen dividend stock is about 8 percent. Therefore, the expected total asset growth rate using this strategy should be around 35 percent each year. However, the simulation will only last for about 12 weeks, which is around 3 months, making the expected asset growth by the end of this simulation to be

$$35\% \times \frac{3 \text{ months}}{12 \text{ months (1 year)}} \approx 9\% \quad (3)$$

This number might not seem to be a lot. However, considering this strategy to be low-risk, low-profit and the fact that the simulation is carried out by non-investing-experienced engineering students, this number should be sufficient enough by the end of the 7-week period.

Furthermore, considering the 35 percent growth rate stated above is only the average number taken over the course of 36 years. Over that period of time, the stock market has gone through many downfalls. Moreover, considering today's growth of technology, it is logical to expect the market's growth rate to be even higher as of now. Therefore, the proposed growth rate is only a preference point for this strategy simulation. The final result might differ from this number, so it can be either higher or lower depends on the market performance and research of each contributor to this report.

### ***3.2. Strategy: System and Timing***

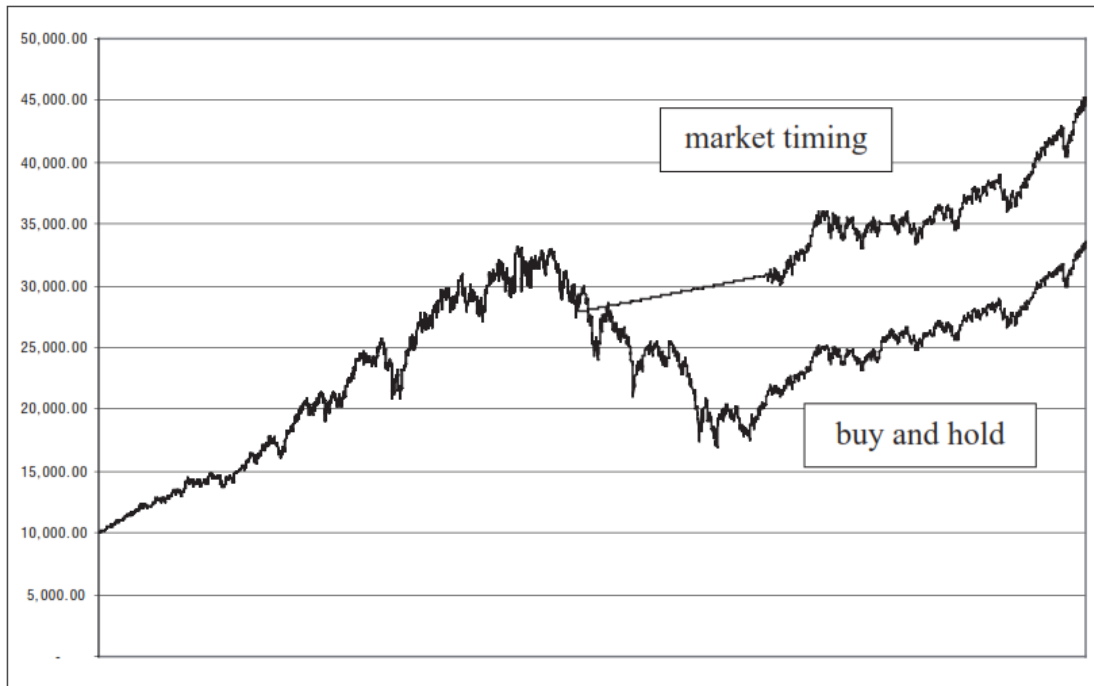
The strategy for this sort of investment is pretty straightforward. In the case of dividend stock, the company with the highest dividend yield will be chosen. Then part of the original asset will be divided into the dividend stock. Once the dividend stock is bought, it is only a matter of time for the holder to get paid, usually once every 3 months, which is the same amount of time as the simulation.

In the case of long-term stock investment, the strategy is to choose a bull company in the market, with a constant stock price growth rate over a long period of time, several years. Then invest most of the investor's money in this company, and let the stock price growth overtime to increase the asset. This might seem like a very leisure and effortless method, in fact it is and also doesn't require a lot of experience in investment as well, but do not be fooled by its simplicity. There is also an element called timing, which plays a vital role in determining the overall asset growth, instead of buy and hold.

Now why is timing so important here? The reason is it prevents the investor from sending his money into a company that is going into bankruptcy. For example, there were a lot of bull companies, companies with constant growth rate over a long period of time that attracts a lot of investors before they collapsed. These companies are British & Commonwealth Shipping, WorldCom, Brent Walker, Ferranti...

In simpler word, timing will save the investor from sending his money into the void. Now, the more important question is how to do the timing? This task required the investor to actually spend some time doing, rather than just buying the stock and wait for its price to rise. Generally speaking, the investor will need to keep track of the bull stock that he has purchased. Whenever

the stock price starts to drop down from its previous peak, it is time to take out the money before the company goes bankrupt. Figure 3.1 shows how timing works versus buy and hold.



*Figure 3.1 Buy and hold Vs. Market timing, , the information was obtained from [6]*

Based on the graph shown above, the strategic moment for pulling out the investment is when the stock price falls below 15% of its previous high peak. Then if the stock price seems to rise about 15% of its previous low peak, invest into the stock again.

In conclusion, with a systematic investment plan, and the combination with dividend stock, this hybrid strategy will ideally provide constant profit gradually overtime with minimal maintaining effort. However, in order for this to happen, the investor must follow the system closely, without letting his belief or emotion interfere.

### 3.3. Chosen Companies

As discussed above, this approach needs a company with a constant stock price growth over a long period of time. Out of the ten targeted companies for this simulation, those fit the descriptions are: Tesla Motors Inc., Facebook Inc., Netflix Inc., Walt Disney Co., and Nike Inc.

Figure 3.2 is the stock price of Facebook from the time the company went public.



*Figure 3.2 Facebook stock price over time, the information was obtained from [7]*

On the other hand, companies that will not fit are those with a very unpredictable stock price growth rate overtime. In Figure 3.3, one company matches this description is Alibaba Group Holding Ltd.



*Figure 3.3 Alibaba Group Holding Ltd. stock price over time, the information was obtained from [8]*

However, there is one thing very important considering company choosing strategy: supply and demand, the name actually describes itself. For a product to be successful in the market, the demand must be equal or even surpass the supply. If it is the other way around, the company will not be able to survive in the market for a considerably long period of time. In real life, it is best to consider companies with the less competitors the better.

The first company to consider is Tesla Motors Inc. For those who do not know, Tesla is the only company in the market to produce a complete electrical, not hybrid electrical-fuel, car for consumers. Moreover, Tesla took over its business from the production line to car vendor. In other word, Tesla Company produces and sells their own car, not having to go through another business. Now, with the upcoming Model 3 aiming to the economical class consumer, it is certain that the demand for Tesla will rise significantly in the future and the supply still does not show any sign of increasing. Therefore, Tesla Motors Inc. is definitely a chosen company for this long-term strategy.

In the case of Facebook Inc., a company currently concentrates in social network. Currently, there are not a lot of service providing social network. On the other hand, with the growth of technology, especially the smart phones, the demand for social networking is

constantly growing every day. Moreover, Facebook is also investing in the virtual reality (VR) technology, Oculus Rift. VR is currently a revolutionary technology and a lot of hobbyist are demanding this technology, but not many companies are developing this technology right now. Therefore, with clear evidence, Facebook Inc., is making it to the list of chosen companies.

Next up is Netflix Inc., a company providing movie streaming service. There are a considerably big list of companies providing the same service: Hulu LLC., Amazon.com Inc., and Twenty-First Century Fox Inc... However, the demand for movie streaming service is considerably high as of now. On the other hand, Netflix Inc. does not seem to have any plan for the future as of now. Therefore, Netflix Inc. barely makes it into the list of chosen companies, but investing into this company will be very wary.

Walt Disney Co., a long-standing animation and movie studio company, is another example of a bull company by theory. Since the company went public in 1978, its stock price has constantly growing over the time. Moreover, since the acquirement of Marvel Studios L.L.C. in 2009, Walt Disney Co.'s stock price has gone up even more than before. Considering the simulation time interval, which will last from now until January, it is very likely that Walt Disney Co. will release some new movie. This will result in a very favorable growth in the company's stock price.

The final potential company is Nike Inc., a company making performance sportswear. Nike was established a long time ago, back in 1964. As of now, the demand for sportswear is still high. On the other hand, there are a lot of other companies providing the same products as Nike Inc.: Adidas AG, New Balance Athletics, Inc., Fila U.S.A., Inc., Saucony Inc., Asics Corp., Therefore, Nike Inc. will not be considered in the list of chosen companies.

For the dividend stock, the only company providing earning per share is Ennis Inc. Therefore, the chosen companies are Walt Disney Co., Tesla Motors Inc., Ennis Inc., Facebook Inc. and Netflix Inc. Table 3.1 is the list of chosen companies and the reasons.

<b>Company name</b>	<b>Symbol</b>	<b>Reason</b>
Ennis Inc.	EBF	Highest dividend yield
Tesla Motor Inc.	TSLA	Bull company
Facebook Inc.	FB	Bull company
Netflix Inc.	NFLX	Bull company
Walt Disney Co.	DIS	Bull company

*Table 3.1 Chosen companies for Hybrid Long-term investment strategy*

### **3.4. Simulation**

#### **3.4.1. Getting Started**

This simulation begins with an initial asset of \$300,000, five chosen companies, and the goal of how to make the most out of this portfolio. Therefore, it is very important to decide where to invest the money into initially, since this is a long-term investment strategy, meaning there is no room for error.

The system and timing was already discussed, but that does not really help with when and where to invest initially. This is where another technique comes into play: the stock price moving average. In technical term, the moving average can be considered as the electrical low-pass filter: it smoothed out the spikes in whatever data it is processing. In other word, this algebra will smooth out the data chart of whatever stock price it is, providing a more accurate overall trend of the company’s performance. This algebra seems very sound and plausible, but how exactly can it indicate the investment strategy? The answer is rather simple actually. Figure 3.4 gives the moving average signal.

A '**buy (invest in the stock market)**' signal is active whenever the most recent **30-week** moving average figure is **greater (higher)** than the most recent **50-week** moving average figure.

A '**sell (savings account investment)**' signal is active whenever the most recent **50-week** moving average figure is **greater (higher)** than the most recent **30-week** moving average figure.

*Figure 3.4 Moving Average Signal, the information was obtained from [9]*

The moving average here is calculated based on the weekly closing price of any stock. Basically, if the current trend of the stock price is increasing, making its most-recent 30-week moving average figure is greater than the most recent 50-week moving average figure, it is a good time to buy, since the chosen company is a bull in the market, and vice-versa. However, due to the duration of this simulation, which is only about 12-week, it is impossible to follow this strategy word-by-word and expect to gain any sort of profit. Therefore, for this simulation, the rule is changed from “week” to “day”. In other word, the moving average is going to be calculated using the daily closing price of any stock and monitored everyday using the daily closing price.

$$\begin{aligned} \text{Point} &= \text{most recent 30 - day average} - \text{most recent 50 - day average} \\ \text{if Point} < 0, &\text{stock is in selling phase. Else if Point} \\ &> 0, \text{stock is in buying phase} \end{aligned} \quad (4)$$

For this simulation, five chosen companies will be tracked using a spreadsheet and the moving average will be calculated every day after closing hour of the stock market. Then the buy and sell decision will be made based on every computation. This spreadsheet will be shown in the appendix by the end of this simulation. Past and current stock price of the companies are taken from NASDAQ website.



Initial calculation, based on the daily closing stock price dating back to the most recent 50-day, shows only two companies in the buying phase: Facebook with 1.5 point and Netflix with 1.8 point. On the other hand, this method cannot be applied to Ennis Inc. The reason is because Ennis Inc. does not pass the qualification for a bull company. Moreover, the next expected dividend payout is October 12th, 2016, the information was obtained from [10]. Therefore, as long as Ennis Inc.'s stock is held during this period of time, everything is good. The strategy for buying this dividend stock is to wait for the price to fall to a low point before investing.

#### 3.4.2. Simulation week 1 (September 26th – September 30th)

On September 26th, 2016, I decided to start investing into three companies: Facebook Inc., Netflix Inc. and Ennis Inc. For the case of Facebook and Netflix, I decided to invest a total of \$180,000 into these two companies: \$100,000 for Netflix and \$80,000 for Facebook based on their moving average point. Then I decided to invest \$60,000 more into Ennis Inc. because the company's stock price seems to have hit its peak. Moreover, I need to hold this company's stock by October 12th, as mentioned above, to earn the dividend share. I did not invest all of my current assets right away because I want to have some emergency fund in case anything bad happens, which is what I would have done in real life situation. Furthermore, I want to have some spare asset in case the other companies also reach its buying phase. Table 3.2 represents my initial asset distribution.

<b>Company</b>	<b>Price</b>	<b>Shares</b>	<b>Total</b>
EBF	\$16.29	3,683	\$59,996.07
NFLX	\$94.56	1,036	\$ 97,964.16
FB	\$127.31	644	\$81,987.64
		<b>Total</b>	\$239,947.87
		<b>Asset remains</b>	\$60,052.13

*Table 3.2 Asset distribution*

One week into the simulation, by the end of September 30th, 2016, the total return of investment is \$6,814.36, which turns out to be 2.17% growth in total asset. However, since the point tracking system has not shown any timing changes, meaning there has not any change in positive point to negative point and vice versa, I will keep holding the stock until the selling phase comes in or the buying phase comes for other companies. Table 3.3 reflects the asset changes by the end of first week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$16.85	+ \$2,062.48
NFLX	\$98.55	+ \$4,133.64
FB	\$128.27	+ \$618.24
	<b>Total</b>	+ \$6,814.36
	<b>Asset growth</b>	+ 2.17%

*Table 3.3 End of 1st week simulation*

### 3.4.3. Simulation week 2 (October 3rd – October 7th)

During the second week, the asset growth reaches its peak at 4.37%, on October 5th, 2016, of total investment, equals a return of \$13,109.94. This rapid growth was mainly due to the Netflix's bubble expanding. There have been some rumors going around about Netflix was offered by big companies such as Disney and Amazon, thus creating the rapid climb in this company's stock price, and there is still no sign of the stock price going down by the end of the week. However, I predict this growth will not maintain for a long period of time. On the other

hand, the point tracking system still have not changed any indication so I will follow it and hold the stock for now.

By the end of the second week simulation, on October 7th, the rapid growth of Netflix has finally died down and seemed to be gradually decreasing. This marks a total of \$11,306.15 total return of investment, which attributes to 3.77% asset growth. Table 3.4 reflects the asset changes by the end of second week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$16.18	- \$405.13
NFLX	\$104.82	+ \$10,629.36
FB	\$128.99	+ \$1,081.92
	<b>Total</b>	+ \$11,306.15
	<b>Asset growth</b>	+ 3.77%

*Table 3.4 End of 2nd week simulation*

#### 3.4.4. Simulation week 3 (October 10th – October 14th)

In the middle of the third week of simulation, on October 11th, 2016, the Netflix’s bubble finally popped. In additional, the Ennis’s stock price has been falling dramatically these past few days. Unsurprisingly, as I only bought Ennis’s stock initially for its highest dividend yield, I will hold this stock past the mark of October 12th, when Ennis will pay out its quarterly dividend share, wait for the price to go over \$17/stock and sell them all to make room for other long term investment. The burst of the Netflix’s bubble and Ennis’s stock price dropping drag my growth rate to 2.49% of total investment by the end of October 11th, 2016 and not showing any sign of increasing back up yet. However, the point tracking system still has not changed any sign indication, so I will stick with that and keep holding the stocks for now.

During the weekend of the third week, on October 16th, 2016, I received a quarterly dividend share from Ennis at a price of \$1.12 per share. The total earning I received is  $\frac{\$1.12/\text{share}}{4} \times 3,683 \text{ shares} = \$1,031.24$ , which is 0.34% growth of total investment. Now that have received the dividend share for this quarter, the next step is to wait for the Ennis's stock price to rise above the \$17 per share mark and sell all of them. The reason behind this is because Ennis has never met the requirements initially for a bull company, the main target for this investment strategy. Moreover, the share price of Netflix has stabilized and started climbing again. Therefore, the total growth of this week turned out to be 1.91% *stocks growth* + 0.34% *dividend earn* = 2.25% growth of total investment. Table 3.5 reflects the asset changes by the end of third week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$15.8	- \$1,804.67
NFLX	\$101.46	+ \$7,148.4
FB	\$127.91	+ \$386.4
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
	<b>Total</b>	+ \$6,761.37
	<b>Asset growth</b>	+ 2.25%

*Table 3.5 End of 3rd week simulation*

#### 3.4.5. Simulation week 4 (October 17th – October 21st)

On October 18th, 2016, the stock price of Netflix skyrockets overnight, growing from \$99.8 to around \$118 per share, which makes an 18.23% growth of value in just one night. I tried to look up some information using Google, and there are some acceptable explanations: Netflix increases the total amount of domestic subscribers to 309,000 and international subscriber to 2.01 million, the information was obtained from [11]. This explanation is not very persuasive for me, but it is the only source of information I have for now. This result in a 7.78% growth of total

investment, which is a total return of \$23,335.62. I did not expect the price to be this volatile when I first chose the companies to watch. Moreover, I also put the current price into the system and there is still no indication for selling yet, and I will follow the system.

By the end of the fourth week, by October 21st, 2016, the price increment of Netflix is still increasing. The total portfolio worth by the end of the fourth week is \$334,308.23, which is a total of 11.44% growth. This number has surpassed the original given goal of around 9%, so I can choose to sell everything and make a call. However, the system still has not shown any signals change for buying or selling yet, thus I still have around 8 more weeks for this simulation. Therefore, I will keep on with this simulation until the end of the 12-week simulation period and see how much wealth has been made. Table 3.6 reflects the asset changes by the end of fourth week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$15.42	- \$3,204.21
NFLX	\$127.5	+34,447
FB	\$132.07	+3,065.44
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
	<b>Total</b>	+ \$35,339.47
	<b>Asset growth</b>	+ 11.78%

*Table 3.6 End of 4th week simulation*

#### 3.4.6. Simulation week 5 (October 24th – October 28th)

Five weeks into the simulation, by the end of October 28th, 2016, the total return of investment is \$30,100.85, which makes up for a total of 10.03% growth. The total portfolio growth decreases by the end of this week, compared to 11.78% last time, due to a slight fluctuation in the time interval between October 24th and October 27th. However, the system was not showing any signals for selling these stocks yet so I will continue to hold on for now. On

the other hand, since the beginning, Ennis is not qualified as a bull company in the market, so the system cannot be applied for this case. Therefore, I will continue to hold Ennis's shares until the price hits the \$17 mark, or probably when it gets back to the original price when I bought. Table 3.7 reflects the asset changes by the end of fifth week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$14.76	- \$5,634.99
NFLX	\$126.58	+ \$33,172.72
FB	\$131.29	+ \$2,563.12
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
	<b>Total</b>	+ \$31,132.06
	<b>Asset growth</b>	+ 10.38%

*Table 3.7 End of 5th week simulation*

#### 3.4.7. Simulation week 6 (October 31st – November 4th)

On Thursday, November 3rd, the stock price of Facebook Inc. drops significantly by approximately %5.3, going from \$127.7 per share to around \$120 per share, overnight. The reason is Facebook's current CFO Dave Wehner forecasted the company's ad sales growth will "come down meaningfully" next year, as increases in the frequency at which ads are shown on Facebook's news feed (ad load) become "a less significant factor driving revenue growth after mid-2017." ,the information was obtained from [12]. On the other hand, the stock price of Netflix Inc. is showing sign of slow growth. However, the stock price of EBF Inc. is still not showing any signs of climbing back up yet. Finally, the system has not shown any signs of selling any of the held or buying new stock yet, so I will keep holding on to what I currently have as of now.

By the end of the sixth simulation week, I have made a total gain of \$19,041.25, which contributes to 6.35% increase of total net worth. As mentioned before, due to the sudden drop of

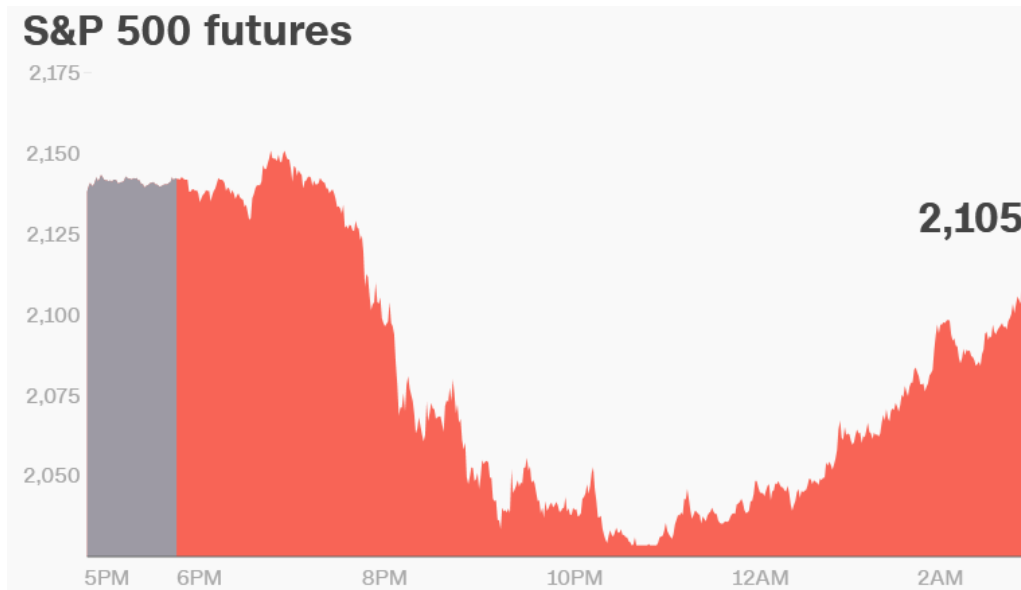
Facebook’s share price as well as the falling price of EBF’s stock, the total gain is expected to be lower in comparison to last week. However, until the end of the week, the system still does not give any sign changes so I will keep sticking with these stocks for now. Table 3.8 reflects the asset changes by the end of sixth week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$14.6	- \$6,224.27
NFLX	\$122.03	+ \$28,458.92
FB	\$120.75	- \$4,224.64
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
	<b>Total</b>	+ \$19,041.25
	<b>Asset growth</b>	+ 6.35%

*Table 3.8 End of 6th week simulation*

**3.4.8. Simulation week 7 (November 7th – November 11th):**

During the first two days of the week, the stock price for all three companies is showing sign of climbing back up. However, dawn of November 9th, an unexpected incident happened that makes the stock market drop significantly: Donald Trump is elected for presidency. Considering how unpredictable Trump is, many investors believe he could bring global turmoil, the information was obtained from [13], thus making the market dropped significantly overnight. This event is somehow similar to what happened to Brexit earlier. Figure 3.5 shows the S&P 500 index during and after the presidential election.



*Figure 3.5 S&P 500 Indexes when Trump was and about to get elected*

One day after the US presidential election, the two major stock hold of mine, Netflix Inc. and Facebook Inc., was dropping rapidly, even though the stock market in general has climbed back up now. The reason behind this drop is that there is a fear that President-elect Trump, with his anti-trade rhetoric and potential future policies, will affect tech companies that rely on production lines outside the United States, the information was obtained from [14]. Therefore, many companies targeting international market, such as Netflix Inc. and Facebook Inc. in my case, are significantly affected by this event. Moreover, Facebook has been criticized by many in the news media for affecting the way news is disseminated and, therefore, the overall result of election. Specifically, the company has been accused of creating insulated echo chambers that expose Facebook users to news that they want to see. However, since Facebook is a social network, not a news media, it is only logically for Facebook to use such a news-feeding algorithm to attract users.

By the end of November 10th, the stock price of Netflix Inc. has fallen to \$115.42 per share. The previously high peak of NFLX is \$126.97/share, making the price falls 10% from its



previously high peak. On the other hand, the system is not making any selling change signs, because this version of system of mine is not making the average over a long period: my system uses daily closing instead of weekly closing price. Therefore, the system is still stuck in the overnight shooting period of Netflix Inc., so I have decided to act against the system in this case based on my calculation and news. I will sell all of my holds from NFLX. For the case of Facebook Inc., the system has shown signs of selling the stock and I will follow. Lastly, Ennis Inc. is not affected by the event and is gradually increasing over time, so I will keep Ennis shares. Next day, by the end of November 11th, the system has showed sign for buying Walt Disney Co. shares. Moreover, investors are expecting the new Shanghai Disney Resort to break even in fiscal 2017. In addition to that, Walt Disney Co. is attempting to scale its digital distribution network by bidding for Twitter Inc. along with technology companies such as Alphabet Inc. and Salesforce.com, Inc. ,the information was obtained from [15]. Table 3.9 shows the first trade of long-term strategy simulation.

<b>Date</b>	<b>Symbol</b>	<b>Action</b>	<b>Price per share</b>	<b>Shares</b>	<b>Net Cost</b>	<b>Profit</b>	<b>Cash Left</b>
11/10/16							\$60,052.13
11/10/16	NFLX	Sell	\$115.42	1,036	\$119,575.12	+ \$21,610.96	\$179,627.25
11/10/16	FB	Sell	\$120.8	644	\$77,795.2	- \$4,192.44	\$257,422.45
11/11/16	DIS	Buy	\$97.63	1,843	\$179,932.09		\$77,490.36
<b>Total Profit</b>						<b>+ \$17,418.52</b>	

*Table 3.9 1st trade of long-term strategy*

By the end of the seventh simulation week, I have shifted my asset distribution from Netflix Inc. and Facebook Inc. to Walt Disney Co., making a total of \$17,418.52, contributing to 5.81% of total asset. Table 3.10 reflects the asset changes by the end of seventh week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$16.30	+ \$36.83
DIS	\$97.68	+ \$0
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
Earning from first trade		+ 17,418.52
	<b>Total</b>	+ \$18,486.59
	<b>Asset growth</b>	+ 6.16%

*Table 3.10 End of 7th week simulation*

### 3.4.9. Simulation week 8 (November 14th – November 18th):

One week after the US presidential election, the stock market has been showing signs of settling down. All of the companies that I have been tracking so far, Ennis, Tesla, Facebook, Netflix, and Walt Disney, only shows minor changes in price per share. In the case of Facebook and Netflix, the companies still have not shown any signs of rising back yet. Specifically, in the case of Netflix, the tracking system still have not stepped over the last price jump, thus I will have to decide the sign by myself based on the market timing criteria.

By the end of this week, Walt Disney's stock has been slowly increasing, together with Ennis. The gradual growth of the two companies results in a total of \$2,173.81 return of investment, which consists of 0.724% of total asset. Table 3.11 reflects the asset changes by the end of eighth week simulation.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
EBF	\$16.60	+ \$1141.73
DIS	\$98.24	+ \$1032.08
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
Earning from first trade		+ 17,418.52
	<b>Total</b>	+ \$20,623.57
	<b>Asset growth</b>	+ 6.87%

*Table 3.11 End of 8th week simulation*

### 3.4.10. Simulation week 9 (November 21st – November 23rd):

This week simulation is rather short because the market closed by the end of November 23rd for Thanksgiving holiday. Despite the short duration, this is still an eventful week for me. On November 21st, the stock price of Ennis Inc. hit the mark of \$17 per share, and thus I sold all of my holds for Ennis, making a total of  $(\$17 \text{ per share} - \$16.29 \text{ per share}) \times 3683 \text{ shares} = \$2,614.93$ . The reason is that Ennis Inc. was never in my list of long-term investment companies. I bought the shares only for the dividend stocks. Moreover, it is risky for me to hold on to Ennis Inc. shares, since the company does not follow the signal of the system.

Another trade I made on November 21st was to invest the rest of the asset into Netflix Inc. I have been manually watching the daily closing price for Netflix for the past weeks and it is showing signs of climbing back up again. As mentioned earlier, the system still has not stepped over the overnight growth of Netflix so I have to make the call by myself. In summary, the trades I made during the ninth week into simulation can be reflected in Table 3.12.

Date	Symbol	Action	Price per share	Shares	Net Cost	Profit	Cash Left
11/21/16							\$77,490.36
11/21/16	EBF	Sell	\$17	3,683	\$62,611	+ \$2,614.93	\$140,101.36
11/21/16	NFLX	Buy	\$116.2	1,204	\$139,904.80		\$196.56
Total Profit						+ \$2,614.93	

*Table 3.12 2nd trade of long-term strategy*

By the end of the ninth week simulation, Table 3.13 reflects the asset change.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
NFLX	\$117.41	+ \$1,456.84
DIS	\$98.82	+ \$2,193.17
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
Earning from first trade		+ \$17,418.52
Earning from second trade		+ \$2,614.93
	<b>Total</b>	+ \$24,714.7
	<b>Asset growth</b>	+ 8.24%

*Table 3.13 End of 9th week simulation*

### 3.4.11. Simulation week 10 (November 28th – December 2nd):

There has been some fluctuation on the price of Netflix and Walt Disney shares, due to the ongoing rumors of Walt Disney acquisition of Netflix, the information was obtained from [16]. Moreover, with his presidential power, Donald Trump is threatening to tear down the net neutrality regulation provided by the Federal Communication Commission (FCC) ,the information was obtained from [17]. Net neutrality is a regulation enforced by the FCC to assure that all contents are treated equally by the Internet Service Provider (ISP). In other word, the ISP cannot limit its bandwidth to certain content to paid, prioritize others. This regulation plays a huge role in Netflix’s performance, since the company provides online movie streaming service, which takes up a lot of bandwidth from the ISPs. Therefore, if net neutrality is to be teared down, it will significantly change Netflix’s original business model, thus can be either better or worse.

Another company worth mentioning is the performance of Facebook. Firstly, after the presidential election, Facebook has been accused of affecting the overall result. Due to its news feed display algorithm, Facebook has been feeding its users whatever news they want to see, thus ultimately making Facebook users failed to see the election as a whole. Moreover, some false information has been displayed as well within Facebook’s algorithm. Secondly, the underwhelming performance of the Virtual Reality (VR) technology, specifically Oculus Rift in

the case of Facebook. There has been a major amount of forecast about VR technology by the end of this year that turned out to be an overestimation.

Despite the news and price fluctuation going on this week, the system has not shown any new buy and sell signs. On the other hand, I have not picked up any signs while manually watching the price as well. By the end of tenth week simulation, Table 3.14 reflects the asset changes.

<b>Company</b>	<b>Week Closing Price</b>	<b>Gain</b>
NFLX	\$120.81	+ \$5,550.44
DIS	\$98.50	+ \$1,603.41
Dividend earned from EBF at \$1.12/share annually		+ \$1,031.24
Earning from first trade		+ \$17,418.52
Earning from second trade		+ \$2,614.93
	<b>Total</b>	+ \$28,218.54
	<b>Asset growth</b>	+ 9.41%

*Table 3.14 End of 10th week simulation*

### 3.4.12. Closing simulation

Since the simulation started on Monday, September 26th, I think it is only fair that it will end on a Monday as well, to make the most out of the 10-week period. Therefore, I decided to sell of my holdings on Monday, December 6th. The final trading is summarized in Table 3.15 below.

<b>Date</b>	<b>Symbol</b>	<b>Action</b>	<b>Price per share</b>	<b>Shares</b>	<b>Net Cost</b>	<b>Profit</b>	<b>Cash Left</b>
12/06/16							\$196.56
12/06/16	DIS	Sell	\$99.96	1,843	\$184,226.28	+ 4,294.19\$	\$184,422.84
12/06/16	NFLX	Sell	\$119.16	1,204	\$143,486.64	+ 3,563.84	\$327,909.48
<b>Total Profit</b>						<b>+ \$7,858.03</b>	

*Table 3.15 Final trade*

With the final trade done, Table 3.16 represents the total asset until the end of the simulation period.

<b>Date</b>	<b>Action</b>	<b>Gain</b>
10/16/16	Dividend earned from EBF at \$1.12/share annually	+ \$1,031.24
11/11/16	Earning from first trade	+ \$17,418.52
11/21/16	Earning from second trade	+ \$2,614.93
12/06/16	Earning from final trade	+ 7,858.03
	<b>Total</b>	+ \$28,922.72
	<b>Asset growth</b>	+ 9.64%

*Table 3.16 End of simulation performance summary*

Initially, I estimated a total asset growth by the end of the simulation period of around 9%. The actual asset growth turned out to be 9.64%, a fraction higher than the initial goal. However, considering how much effort I have put into stock watching and experience I have had with market investment prior to this simulation, this result is very promising.

### ***3.5. Simulation analysis and conclusion***

#### ***3.5.1. Overall performance***

During the course of this 10-week simulation, my asset growth has been fluctuated quite a bit, despite of its long-term name, as seen below in Figure 3.6.



*Figure 3.6 Asset growth over the 10-week simulation*

In the graph above, there is one significant event worth mentioning: the jump of total income within the night between October 17th and October 18th. The event was due to the sudden jump of Netflix's holdings, going from \$99.8 per share by the end of October 17th to \$118 per share by the end of October 18th that made a total of 18.23% growth of value overnight. This price mutation from Netflix provided me with a total gain of \$20,079.15, contributing to 6.69% of total asset growth. Until now, I still have not been able to find any explanation for this price jump other than Netflix's increment in both domestic and international subscribers. Now, taking a step back, without this price mutation, my final asset growth would be limited to only  $\$28,922.72 - \$20,079.15 = \$8,843.57$ , which is only 2.95% of total asset growth, only a fraction of the Netflix's price fluctuation. Therefore, even though I have reached the desired initial goal for this simulation by the end, it is mostly pure luck that helps me reaching that goal.

Another element effecting the overall performance of the market is unexpected significantly events, such as the US presidential election on November 9th, which resulted in the rise to power of Donald Trump. The result was obviously unexpected, thus backfired the forecast of many financial experts, causing a mass drop within the stock market. However, the event did not have a long effect, as the market soon got back onto its standing. Having said that, some companies did not recover from the incident. Most social network companies manipulating the election outcome was struck hard by the election. For example, Facebook with its news feeding algorithm, which "intelligently" chose what news articles its users would like to see without verifying the source, influenced majority of people during the election.

Finally, the financial forecast of analysts can affect how a stock price behaves. For example, in the case of Facebook, there has been an overestimation of VR technology by the end

of this year, 2016. In addition to that, experts have been predicting the drop of incomes from ads by social network services. These two elements ultimately, along with the presidential election outcome, contributes to the hard drop of price per share by Facebook in Q4 2016.

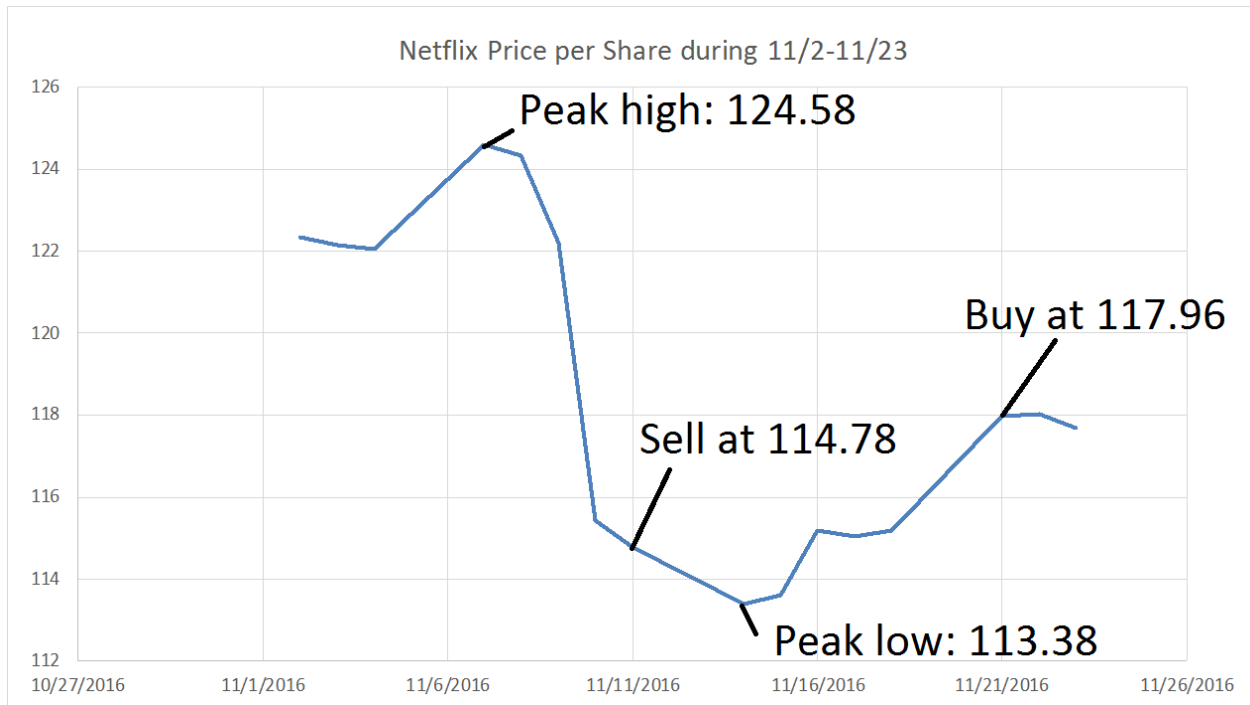
### 3.5.2. System analysis: Moving average and Market timing

Out of the five chosen companies, only four companies are eligible for the moving average signal tracking system. The reason is Ennis does not qualify as a bull company, and thus the system could not be applied for this company. During the 10-week simulation period, the system has given me accurate reading on whether I should buy or sell stock. For example, the system has given sign to sell my shares of Facebook on November 10th at a price of \$120.8 per share. Even though I did not profit from that trade, but if I were to hold those shares until now, I would have lost even more money when Facebook shares have dropped to \$117.32 per share by the end of the simulation. The moving average tracking system performance can be seen in the Appendix. The scores showed in the graph represents the signal: positive for buying and negative for selling.

Relying solely on the moving average system alone is not a smart plan, considering there are fluctuations within the stock market that the system would not be able to filter out and thus giving the wrong calls. In the case of Netflix, there has been a major dropped of price in its shares due to the election of Donald Trump. Many investors believe Trump's future policies will have a major effect on Netflix reaching international subscribers. In addition to that, the removal of Net Neutrality would significantly harm Netflix's business model, since its streaming service relies heavily on the internet bandwidth. Despite the continually drop in price, the moving average system could not give the correct signal due to the sudden surge in price



happened on October 17th. Therefore, I have to rely on market timing and manually make the call myself, as shown in Figure 3.7 below.



*Figure 3.7 Market timing instead of moving average*

Using market timing, I have to manually watch the daily closing price, and determine whether to buy or sell based on the percentage change from the previous price peak. In this case, I decided to sell the shares when its price has dropped to 7.9% from its previous highest price, and sell the shares when its price has increased back to 4.04% from its previous lowest price. Ideally, the change percentage should be in the range of 10%-15%, but I have decided to take the risk based on the news revolving around Netflix.

### 3.5.3. Strategy Pros and Cons

After the simulation period, I have come up with the list of pros and cons for this long-term hybrid strategy.

Pros:

- Low-maintenance effort: I only need around 5 minutes a day for each company I am currently watching to work the market timing and moving average system. Moreover, the only information I need to keep track of is the daily closing price.
- Constant growth rate: if a correct company is chosen, the growth rate over time will be very stable, like deposit your money to a bank saving account.
- Dividend stocks give you income overtime, so you will definitely get something back in the end.
- Does not require a lot of investing experience: all I have done for this simulation is follow the moving average signals and do the market timing to make investments. There is no need to hire a professional consultant or financial forecast to make calls.

Cons:

- Slow growth rate: a drawback for the constant growth rate, which is acceptable since you get a safe guarantee to make a profit.
- Requires a significant long amount of time to get sufficient profit: this is the consequence from the slow growth rate mentioned above. Moreover, the dividend stocks also require a long time to pay off.
- Somewhat dependent on significantly unexpected events going on: like what happened to the US presidential election earlier. Therefore, although this strategy

does not require a lot of maintenance effort, the investor still needs to keep tracks of important events going on to make the right call.

In final words, with the pros and cons listed out above, I would conclude that this investment strategy is suitable for someone who has a big asset but does not want to waste it by depositing into a bank, as well as does not have a lot of experience and time to maintenance the investment system.

## **4. Day Trading**

### ***4.1. Simulation Goal***

For this day trading simulation, traders will start with \$200,000 and all the trades will simulate based on NYSE stock market price with commission fee of \$10 per transactions. The profit of each trading day accounts for a small percentage of the investment money, however, if traders can make small profit every single day, by the end of 10 weeks, that small percentage could add up to a big number. However, day trading also includes lots of risk because of the volatile of the stock price within a day. By the end of each day, the stock could increase 1% or decrease 3%, however, within a day, the differences between the lows and highs of the stock could be up to 5% of the stock price, which means trader could potentially make 5% of investment money or lose 5% of total money. Therefore, the stop and target of each trade should be limited to around 2%. Each trade will use at least one-fifth of the total money therefore 2% limit would equal to 0.4% limit of total money. If each two-day trader can make at least 1 successful trade, then in 10 weeks, total of 50 trading days, traders can make  $\frac{50}{2} \times 0.4\% = 10\%$ . Therefore the goal of day trading method is to experiment day trading with trend, pick up the low and high of the stock within normal hours stock market while making profit at around 10%.

### ***4.2. Strategy***

Day trading strategy requires the trader to be selective and choose stock wisely. In this trading strategy, trader will have to look at all ten chosen company, then wait and analyze which stocks is reaching its low peak and buy them. Other methods of analyzing will also be used such

as analyze trend of the stock market within multiple previous day to predict if the stock would increase on that day, or analyze how much the stock price decrease in the past few days to predict if the stock price now is at its local minimum.

Day trading also requires discipline with traders own rule to avoid risk and emotion. Therefore, making clear rules and trading method for this strategy is the best way to start. There are multiple rules that the trader need to set such as frequency of trade, time interval for waiting for the price to reach its local peak, the stop and target for each trade.

For frequency of trade, this trading strategy will have set rules of at least one trade per day and maximum five trades per day. The limit was set because it is a form of risk control to make sure trader are aware of potential lose while keep experimenting with trades. Trader have to use minimum of \$20,000 per trade and maximum of 50,000 per trade. Trader will not use borrowed money to trade.

The stop and target of each trader will change before the trade happen from 1% change to 2% change of the purchase price. This decision is to control the risk of investment but also control the emotions of the trader.

Because the stock market trade open from 9:30 am to 4 pm, therefore the purchase face will happen for the first 6 hours, no purchase will be made in the last hours. The trader will can purchase only when the price decreases and stabilize for the last 10 minutes. Traders can sell the stock when the stop and target reach or if the price increase and stable for at least 30 minutes. If there was a rapid increase in price but followed by a small decrease, the target could be flexible and trader could sell the stocks right away.

### 4.3. Chosen Companies

Day trading makes profit by the volatile characteristic of the stock price. Therefore, in ten of potential company to choose, all of company are possible for day traders to make profit, especially Tesla Motors Inc., Facebook, Walt Disney and Nike that have large quantity of trades and volatile stock price. For example, Figure 4.1 below, which is Tesla stock price on September 23th 2016, really shows the volatile character of this stock.



*Figure 4.1 Tesla Stock Price on Sep 23, 2016*

In the figure above, the different between the minimum price and the maximum price is around 1.7% (which is between our goals), which shows that Tesla Stock price is very volatile. For example, trader can make two successful trade if trader purchase from 10 am and 1:15 pm and sell it on 11:30 am and 3 pm respectively. Therefore, Tesla Stock has possible potential for day trading practice.

Another possible company for trading is Nike. Figure 4.2 below shows the stock price of NKE on September 23th, 2016.



*Figure 4.2 Nike Corp Sep 23, 2016*

The figure above are stock price of Nike Corp in one day, even though the stock price of end of the day is decrease, however day trader could still make money if he or she picked the low and sell it on the high which is 1.07% difference (still in the range of target). Therefore, day traders can make money even though the weekly trend of stock is still going down.

## ***4.4. Simulation***

### ***4.4.1. Simulation week 1***

After the first week simulation, the total net change is \$354 (without commission fee) with 10 profit trades, and 3 deficit trades. With commission fee of \$10 per transaction, the profit made after the first week of simulation is only \$94. After the first day of trading, the cut off price of stop price changed from 1% to 0.5% to cut off lost. This was made because of the JPM stock reduced 2% that day, and the deficit could be negated by reducing the cut-off percentage. The result of first week simulation shows in the Table 4.1 below.

Date	Symbol	buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
9/26/2016							200,000	
	NKE	Buy	\$54.33	200	10876		189124	
	NFLX	Buy	\$94.34	150	14161		174963	
	JPM	Buy	\$66.37	200	13284		161679	
	TSLA	Buy	\$208.77	100	20887		140792	
	BABA	Buy	\$105.53	100	10563		130229	
	NKE	Sell	\$54.32	200	10854	-22	141083	-22
	NFLX	Sell	\$94.36	150	14144	-17	155227	-39
	JPM	Sell	\$65.76	200	13142	-142	168369	-181
	TSLA	Sell	\$209.12	100	20902	15	189271	-166
	BABA	Sell	\$105.53	100	10568	5	199839	-161
9/27/2016	TSLA	Buy	\$205.77	150	30875.5		168963.5	
	NKE	Buy	\$54.69	150	8213.5		160750	
	DIS	Buy	\$91.64	150	13756		146994	
	TSLA	Sell	\$206.67	150	30990.5	115	177984.5	-46
	NKE	Sell	\$55.43	150	8304.5	91	186289	45
	DIS	Sell	\$91.71	150	13746.5	-9.5	200035.5	35.5
9/28/2016	NKE	Buy	\$53.11	150	7976.5		192059	
	NKE	Sell	\$53.21	150	7971.5	-5	200030.5	30.5
9/29/2016	NKE	Buy	\$52.98	200	10606		189424.5	
	BABA	Buy	\$105.31	150	15806.5		173618	
	NFLX	Buy	\$96.76	150	14524		159094	
	NKE	Sell	\$52.7	200	10530	-76	169624	-45.5
	BABA	Sell	\$106.12	150	15908	101.5	185532	56
	NFLX	Sell	\$96.88	150	14522	-2	200054	54
10/30/2016	CBS	Buy	\$54.34	150	8161		192059	
	CBS	Sell	\$54.74	150	8201	40	200094	94

*Table 4.1 Simulation week 1 day trading*

All of trades were purchasing when trader felt if there was a local minimum price, which is when the price stayed around the same price for more than 15 to 30 minutes. Most of the purchasing stock was when the stock is decreasing, comparing to its open price, 1% or more. Therefore, there is a bigger chance of bouncing price of the stock in the day, which showed in 10 successful trades for this week.

However, these buying techniques showed lots of miss timing if the traders did not follow the market every minutes. Because when the price is going up, there will not be local min of the



price graph. Therefore, trader made no purchase decision. This could both be a safe way not to lose money, but it is also a miss opportunity to make money.

In addition, the profit of the week was \$94; however, this number could increase by much more if the traders used more invested money. Therefore, for next week, traders will apply these rules: traders will buy stocks with amount of 300 to 500 stocks (around \$20000 to \$80000 each trader). Traders will also start buying stock if the price is not in local minimum price (or the price is increasing for 30 minutes with lots of buyer then sell it right away if it reaches its local max).

#### *4.4.2. Simulation week 2*

The second week of day trading simulation was very good with lots of positive trade, in the first two days, four out of five selling decision was made because the price of stock increase then make a local maximum peak then decrease down to its original price, therefore the decisions were made to make profits. Therefore, one of the next rules to set for next week will be the percentage reduction in price where the price reaches its maximum peak to sell those stocks. The data of second week simulation shows in the Table 4.2 below.

Date	Symbol	buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/3/2016							200094	
	BABA	Buy	105.09	500	52555		147539	
	FB	Buy	128	500	64010		83529	
	BABA	Sell	105.38	500	52680	125	136209	219
	FB	Sell	128.77	500	64375	365	200584	584
10/4/2016	FB	Buy	128.07	500	64045		136539	
	BABA	Buy	105.35	500	52685		83854	
	DIS	Buy	92.15	500	46085		37769	
	FB	Sell	128.33	500	64155	110	101924	694
	BABA	Sell	105.45	500	52715	30	154639	724
	DIS	Sell	92.37	500	46175	90	200814	814
10/5/2016	TSLA	Buy	210.7	500	105360		95454	
	TSLA	Sell	211.09	500	105535	175	200989	989
10/6/2016	TSLA	Buy	201.64	500	100830		100159	
	BABA	Buy	106.52	500	53270		147809	
	TSLA	Sell	201.86	500	100920	90	201079	1079
	BABA	Sell	107.01	500	53495	225	201304	1304
10/7/2016	BABA	Buy	106.71	500	53365		147939	
	FB	Buy	128.63	500	64325		83614	
	TSLA	Buy	197.38	400	78962		4652	
	BABA	Sell	106	500	52990	-375	57642	929
	FB	Sell	128.99	500	64485	160	122127	1089
	TSLA	Sell	196.61	400	78634	-328	200761	761

*Table 4.2 Simulation week 2 - day trading*

Compare to week 1, week 2 trades increase amount of stocks purchased (from around 150 to around 500) and the result showed in an increase net change profit and the percentage gain compared to last week (667\$ and 0.33% profit). However, the risk of increase amount of stock also showed in trade on Friday where almost \$800 were lost, the profit could be double if trader did not make those two trades. Therefore, trader will add one more rule for next week is trader will not buy stock if the trends of the stock kept decrease without any raise and drop (at least 0.25% of stock price).

Therefore, for next week, trader will purchase same amount of stocks with similar timing and rules. Two more rules will be added which are the percentage reduction in price where the

price reach its maximum peak to sell that stocks, and trader will not buy stock if the trends of the stock kept decrease without any raise and drop (at least 0.25% of stock price).

#### *4.4.3. Simulation week 3*

For week 3, the new simulation rule where if there was a peak and a decrease in price of a stock then trader will sell the stock lead to a high number of small positive profit trade shown multiple times on the stock at 10/11 and 10/12. Trades in week three shows in the Table 4.3 below.

<b>Date</b>	<b>Symbol</b>	<b>buy/ Sell</b>	<b>Price</b>	<b>Shares</b>	<b>Net Cost/ Proceeds</b>	<b>Profit/ Loss</b>	<b>Total Cash</b>	<b>Total Profit</b>
10/10/2016							200761	
	DIS	Buy	92.91	500	46465		154296	
	NKE	Buy	52.02	500	26020		128276	
	DIS	Sell	93.18	500	46580	115	174856	876
	NKE	Sell	51.77	500	25875	-145	200731	731
10/11/2016	BABA	Buy	105.45	400	42190		158541	
	FB	Buy	129.19	400	51686		106855	
	NKE	Buy	51.62	400	20658		86197	
	TSLA	Buy	200.09	400	80046		6151	
	BABA	Sell	104.95	400	41970	-220	48121	511
	FB	Sell	129.43	400	51762	76	99883	587
	NKE	Sell	51.78	400	20702	44	120585	631
	TSLA	Sell	200.3	400	80110	64	200695	695
10/12/2016	BABA	Buy	102.53	500	51275		149420	
	CBS	Buy	55.04	500	27530		121890	
	BABA	Sell	103.56	500	51770	495	173660	1190
	CBS	Sell	55.16	500	27570	40	201230	1230
10/13/2016	TSLA	Buy	197.77	500	98895		102335	
	FB	Buy	127.03	500	63525		38810	
	BABA	Buy	100	500	50010		152525	
	TSLA	Sell	199.77	500	99875	980	138685	2210
	FB	Sell	127.72	500	63850	325	202535	2535
	BABA	Sell	101.06	500	50520	510	203045	3045
10/14/2016	TSLA	Buy	198.25	500	99135		103910	
	BABA	Buy	102.62	500	51320		52590	
	TSLA	Sell	197.25	500	98615	-520	151205	2525
	BABA	Sell	102.72	500	51350	30	202555	2555

*Table 4.3 Simulation week 3 day trading*

The target and stop percentage at 1% and 0.5% worked well in the simulation therefore in the next few week, no change will be made to the target and stop. One more noticeable thing in the simulation was that day trading working made lots of profit with stocks that change its price frequently such as BABA, FB or TSLA. Therefore, when traders buy the stock when the price is decreasing, there were a better chance that the stocks will increase again due to swing within a day. For next week, simulation will have the same rules.

#### 4.4.4. *Simulation week 4*

This week, trader lower the amount of trade deals, however, every trade had positive profit, which deduce to a 2.02% profit gain over eight trades made during the week. The result of week 4 simulation shows in the Table 4.4 below.

<b>Date</b>	<b>Symbol</b>	<b>buy/ Sell</b>	<b>Price</b>	<b>Shares</b>	<b>Net Cost/ Proceeds</b>	<b>Profit/ Loss</b>	<b>Total Cash</b>	<b>Total Profit</b>
10/17/2016	NFLX	Buy	98.81	500	49415		153140	
	NFLX	Sell	99.8	500	49890	475	203030	3030
10/18/2016	DIS	Buy	91.33	500	45675		157355	
	DIS	Sell	91.56	500	45770	95	203125	3125
10/19/2016	TSLA	Buy	198.7	500	99360		103765	
	DIS	Buy	91.07	500	45545		58220	
	BABA	Buy	103.78	500	51900		6320	
	TSLA	Sell	200.71	500	100345	985	106665	4110
	DIS	Sell	91.93	500	45955	410	152620	4520
	BABA	Sell	103.94	500	51960	60	204580	4580
10/20/2016	BABA	Buy	103.64	500	51830		152750	
	TSLA	Buy	199.06	500	99540		53210	
	BABA	Sell	104.39	500	52185	355	105395	4935
	TSLA	Sell	201.21	500	100595	1055	205990	5990
10/21/2016	DIS	Buy	90.67	500	45345		160645	
	DIS	Sell	92.01	500	45995	650	206640	6640

*Table 4.4 Simulation week 4 day trading*

Week 4 simulation was very successful. Out of eight trades, five trades actually reach their targets, however, after that the stocks' price still increased. Therefore, for next week, trader would raise the target to 1.5%. One of the trades was the stock had a small peak then decreased its price, and two other trades was the stock slowly go up and down but still increased its price toward the end of the market.

#### 4.4.5. *Simulation week 5*

Week 5 simulation had positive profit, however comparing to week 4, week 5 simulation was less effective and has more losing trades. All the trades of week 5 below in the Table 4.5.

<b>Date</b>	<b>Symbol</b>	<b>buy/ Sell</b>	<b>Price</b>	<b>Shares</b>	<b>Net Cost/ Proceeds</b>	<b>Profit/ Loss</b>	<b>Total Cash</b>	<b>Total Profit</b>
10/24/2016	BABA	Buy	104.1	500	52060		154580	
	BABA	Sell	104.5	500	52240	180	206820	6820
10/25/2016	NFLX	Buy	126.19	500	63105		143715	
	FB	Buy	132.54	500	66280		77435	
	NFLX	Sell	126.75	500	63365	260	140800	7080
	FB	Sell	132.29	500	66135	-145	206935	6935
10/26/2016	TSLA	Buy	201.92	500	100970		105965	
	BABA	Buy	103.39	500	51705		54260	
	TSLA	Sell	202.4	500	101190	220	155450	7155
	BABA	Sell	102.78	500	51380	-325	206830	6830
10/27/2016	BABA	Buy	102.42	500	51220		155610	
	FB	Buy	130.21	500	65115		90495	
	TSLA	Buy	207	500	103510		103000	
	BABA	Sell	102.38	500	51180	-40	141675	6790
	FB	Sell	129.69	500	64835	-280	206510	6510
	TSLA	Sell	205.97	500	102975	-535	205975	5975
10/28/2016	DIS	Buy	93.92	500	46970		159005	
	TSLA	Buy	201.21	500	100615		58390	
	DIS	Sell	94.17	500	47075	105	105465	6080
	TSLA	Sell	203.56	500	101770	1155	207235	7235

*Table 4.5 Simulation week 5 day trading*

Increase the target threshold from 1% to 1.5% only affect one trade in this week, which is the last trade TSLA, which made the most profit of the week, without the last trade the week would produce a negative profit of -\$380. Three trades in the week had reach its stop threshold and only one reach its target threshold, however because the target is 1.5% which is triple the stop threshold which is 0.5%, therefore the week still produce a positive net change.

Moreover, the high profit trade made with TSLA, the TSLA stock end price at 10/28/2016 actually lower than its opening price, however, the purchasing decision was made when the stock decreased its price and stay in that range for 15 minutes, after that the stock increased and reach above its target threshold, selling decision was made. The stock price went up a little bit more and kept decreasing nearly 6% toward the end of the market. Therefore, it is important to make decision when purchasing the stock and target and stop threshold.

#### *4.4.6. Simulation week 6*

Week 6 simulation experienced a special case of trading on 1/11 where traders bought stock from TSLA the second time after a first time have to sell stock at cut lost price. Details of all trades are below in the Table 4.6.

<b>Date</b>	<b>Symbol</b>	<b>buy/ Sell</b>	<b>Price</b>	<b>Shares</b>	<b>Net Cost/ Proceeds</b>	<b>Profit/ Loss</b>	<b>Total Cash</b>	<b>Total Profit</b>
10/31/2016	TSLA	Buy	197.22	500	98620		108615	
	NFLX	Buy	125.51	500	62765		45850	
	TSLA	Sell	197.73	500	98855	235	144705	7470
	NFLX	Sell	125.61	500	62795	30	207500	7500
1/11/2016	TSLA	Buy	195.28	500	97650		109850	
	FB	Buy	131.05	500	65535		44315	
	TSLA	Sell	194.31	500	97145	-505	141460	6995
	TSLA	Buy	191.72	500	95870		110780	
	FB	Sell	130.4	500	65190	-345	206650	6650
	TSLA	Sell	192.96	500	96470	600	207250	7250
2/11/2016	BABA	Buy	100.52	500	50270		156980	
	TSLA	Buy	189.11	500	94565		112415	
	FB	Buy	128.39	500	64205		48210	
	BABA	Sell	100.02	500	50000	-270	206980	6980
	TSLA	Sell	190.47	500	95225	660	143435	7640
	FB	Sell	128.95	500	64465	260	207900	7900
3/11/2016	BABA	Buy	97.62	500	48820		159080	
	BABA	Sell	98.31	500	49145	325	208225	8225
4/11/2016	TSLA	Buy	186.94	500	93480		114745	
	TSLA	Sell	191.66	500	95820	2340	210565	10565

*Table 4.6 Simulation week 6 day trading*

Traders made the decision to buy again from TSLA because traders determine there should be a swing back in price after the stock kept decreasing for two hours. The stock price actually swings back in around 20 minutes from the local minimum, which made the trade had positive profit. There is an example of the advantages of day trading in the situation where the stock market went red but traders could still make profit by choosing the correct time to purchase stock.

#### *4.4.7. Simulation week 7*

This week simulation was a special week, where the president election happened and it greatly affected the stock market on Thursday and Friday. All the trades are below in the Table 4.7.



<b>Date</b>	<b>Symbol</b>	<b>buy/ Sell</b>	<b>Price</b>	<b>Shares</b>	<b>Net Cost/ Proceeds</b>	<b>Profit/ Loss</b>	<b>Total Cash</b>	<b>Total Profit</b>
7/11/2016	BABA	Buy	99.78	500	49900		160665	
	NFLX	Buy	124.07	500	62045		98620	
	BABA	Sell	99.35	500	49665	-235	148285	10270
	NFLX	Sell	124.58	500	62280	235	210565	10505
8/11/2016	TSLA	Buy	191.43	500	95725		114840	
	DIS	Buy	94.01	500	47015		67825	
	TSLA	Sell	195.56	500	97770	2045	165595	12550
	DIS	Sell	94.46	500	47220	205	212815	12755
9/11/2016	TSLA	Buy	187.84	500	93930		118885	
	BABA	Buy	97.06	500	48540		70345	
	NFLX	Buy	122.15	500	61085		9260	
	TSLA	Sell	190.06	500	95020	1090	104280	13845
	BABA	Sell	96.65	500	48315	-225	152595	13620
	NFLX	Sell	121.31	500	60645	-440	213240	13180
10/11/2016	TSLA	Buy	182.46	500	91240		122000	
	FB	Buy	117.4	500	58710		63290	
	BABA	Buy	93.68	500	46850		16440	
	TSLA	Sell	186.69	500	93335	2095	109775	15275
	FB	Sell	121	500	60490	1780	170265	17055
	BABA	Sell	94.91	500	47445	595	217710	17650
11/11/2016	FB	Buy	118.75	500	59385		158325	
	FB	Sell	119.24	500	59610	225	217935	17875

*Table 4.7 Simulation week 7 day trading*

In the last two day of week 6 trading, the president election was happening and the result really affected the stock market on Thursday and Friday. Almost all the stock in the first two to three hours of trading decreased 5 to 6%, however when the price seemed to stop decreasing and stayed in fixed range, trader made purchasing decision and the price of the purchased stock slowly increase throughout the whole market (slowly increase for four hours), which made all the trades have profits.

#### 4.4.8. *Simulation week 8*

This week was the week after the election. The stock market seemed to be back to normal. Trader made fewer trades this week due to fewer opportunities to purchase stock available. The result of this week is below in Table 4.8.

<b>Date</b>	<b>Symbol</b>	<b>buy/ Sell</b>	<b>Price</b>	<b>Shares</b>	<b>Net Cost/ Proceeds</b>	<b>Profit/ Loss</b>	<b>Total Cash</b>	<b>Total Profit</b>
14/11/2016	FB	Buy	115.51	500	57765		160170	
	NFLX	Buy	112.33	500	56175		103995	
	TSLA	Buy	182.96	500	91490		12505	
	FB	Sell	115.64	500	57810	45	70315	17920
	NFLX	Sell	112.39	500	56185	10	126500	17930
	TSLA	Sell	183.21	500	91595	105	218095	18035
15/11/2016	NFLX	Buy	114.51	500	57265		160830	
	FB	Buy	117.12	500	58570		102260	
	NFLX	Sell	113.94	500	56960	-305	159220	17730
	FB	Sell	117.46	500	58720	150	217940	17880
16/11/2016	TSLA	Buy	182.17	500	91095		126845	
	TSLA	Sell	183.64	500	91810	715	218655	18595
17/11/2016	BABA	Buy	93.78	500	46900		171755	
	BABA	Sell	94.11	500	47045	145	218800	18740
18/11/2016	FB	Buy	117.34	500	58680		160120	
	BABA	Buy	93.42	500	46720		113400	
	TSLA	Buy	186.64	500	93330		20070	
	FB	Sell	117.45	500	58715	35	78785	18775
	BABA	Sell	93.65	500	46815	95	125600	18870
	TSLA	Sell	185.02	500	92500	-830	218100	18040

*Table 4.8 Simulation week 8 day trading*

This week profit was positive, however due to two losing trade on 15/11 and 18/11 made a huge lost for the traders, because those two trades have to sell stock at cut lost price. There were also many small profit trades during the week occurred multiple times during the simulations. It is difficult due to time constraint for the traders to buy stock while the stock is increase because traders have to watch the stock market every 5 to 10 minutes. This week simulation experienced lots of miss opportunity where stock price increased very fast, however traders missed the short

amount of time where the price kept going up, and later the price stabilized again at high price, trader could not purchase that stock anymore.

#### *4.4.9. Simulation week 9 and 10*

Week 9 and 10 simulations was combined together with week 9 is thanksgiving week, therefore one trading day, thanksgiving day was cancel and one day with shorter trading time. This week, traders tested new purchasing strategy which is buying stocks and selling them in short window (15-minute window) when the stock price just increase in the last 5 minutes quickly after a decrease for a long time. The results of week 9 and week 10 presented in Table 4.9 below.

<b>Date</b>	<b>Symbol</b>	<b>buy/ Sell</b>	<b>Price</b>	<b>Shares</b>	<b>Net Cost/ Proceeds</b>	<b>Profit/ Loss</b>	<b>Total Cash</b>	<b>Total Profit</b>
21/11/2016	DIS	Buy	97.62	500	48820		169280	
	TSLA	Buy	187.2	500	93610		75670	
	BABA	Buy	93.07	500	46545		29125	
	DIS	Sell	97.9	500	48940	120	78065	18160
	TSLA	Sell	186.86	500	93420	-190	171485	17970
	BABA	Sell	93.41	500	46695	150	218180	18120
22/11/2016	FB	Buy	121.85	500	60935		157245	
	BABA	Buy	93.53	500	46775		110470	
	FB	Sell	121.54	500	60760	-175	171230	17945
	BABA	Sell	93.91	500	46945	170	218175	18115
23/11/2016	FB	Buy	120.17	500	60095		158080	
	FB	Sell	120.51	500	60245	150	218325	18265
25/11/2016	FB	Buy	120.56	500	60290		158035	
	TSLA	Buy	195	500	97510		60525	
	BABA	Buy	93.12	500	46570		13955	
	FB	Sell	120.38	500	60180	-110	74135	18155
	TSLA	Sell	196.65	500	98315	805	172450	18960
	BABA	Sell	93.01	500	46495	-75	218945	18885
28/11/2016	BABA	Buy	94.05	500	47035		171910	
	BABA	Sell	93.76	500	46870	-165	218780	18720
29/11/2016	DIS	Buy	99.31	500	49665		169115	
	TSLA	Buy	192.6	500	96310		72805	
	DIS	Sell	99.6	500	49790	125	122595	18845
	TSLA	Sell	193.02	500	96500	190	219095	19035
30/11/2016	FB	Buy	118.48	500	59250		159845	
	BABA	Buy	93.63	500	46825		113020	
	TSLA	Buy	188.55	500	94285		18735	
	FB	Sell	118.42	500	59200	-50	77935	18985
	BABA	Sell	94.02	500	47000	175	124935	19160
	TSLA	Sell	189.4	500	94690	405	219625	19565
1/12/2016	BABA	Buy	91.86	400	36754		182871	
	FB	Buy	115.2	400	46090		136781	
	TSLA	Buy	187.54	400	75026		61755	
	NFLX	Buy	115.34	400	46146		15609	
	BABA	Sell	91.55	400	36610	-144	52219	19421
	FB	Sell	115.51	400	46194	104	98413	19525
	TSLA	Sell	186.84	400	74726	-300	173139	19225
	NFLX	Sell	115.36	400	46134	-12	219273	19213
2/12/2016	TSLA	Buy	180.49	500	90255		129018	
	TSLA	Sell	181.47	500	90725	470	219743	19683

Table 4.9 Simulation week 9 and 10 day trading

The two trades that applied short trading window is the trade with TSLA on 29/11/2016, and FB on 1/12/2016. The two trades happen when the price decrease price for 1 to 2 hours for 7 to 8 %. However, when the price stopped decreasing and started increasing again, trader made the purchased decision. Then the stock was watched in 5-minute interval and if there was a local peek of the stock price then the stock was sold. These two trades were two examples of the stock price swing in day trading. Overall, the two-week simulation went well and had profit of \$1643, which is better than week 8 when the election happened and the stock market was unstable.

#### ***4.5. Strategy conclusion***

The simulation started on Monday, September 26<sup>th</sup>. After 10 weeks, the simulation ended at December 2<sup>nd</sup>. The overall weekly simulation is below in Table 4.10.

<b>Week</b>	<b>Total money (\$200.000)</b>	<b>Profit</b>
Week 1	200094	94 (0.047%)
Week 2	200761	761 (0.38%)
Week 3	202555	2555 (1.2775%)
Week 4	206640	6640 (3.32%)
Week 5	207235	7235 (3.6175%)
Week 6	210565	10565 (5.2825%)
Week 7	217935	17935 (8.9675%)
Week 8	218100	18100 (9.05%)
Week 9	218945	18945 (9.4725%)
Week 10	219743	19743 (9.873%)

*Table 4.10 Weekly overall profit over 10 weeks*

The total profit of the simulation, the total number of trade made with profit and lost and the total commission fee used are below in Table 4.11.

Starting money	\$200.000
Ending money	\$219.743
Profit	19.743 (9.7815%)
Total of trades	106
Number of positive trade	71 (66.98%)
Number of lost trade	35 (33.12%)
Total commission fee	\$2120 (1.06%)

*Table 4.11 Overall trades data*

Overall, the simulation went well. There are a few noticeable details about day trading compare to other types of trades. Day trading does not affect greatly by news and after hour trade because trader made decision purchasing based on the local minimum of the stock price and not the opening price. Target and lost cutoff are very important for day trading because it reduced the lost while also secure profit within the trade. Stocks that volatile within a day are very good for day trading, however, it also contains the risks of losing money, however with the help of lost cutoff, the amount of amount losing was minimal. The time when the price is stabilizing after a decrement from the opening price is the good time to buy stocks. However, buying stock when it is stabilizing after an increment might be a 50-50 because it could create a local maximum. Buying stock when it is increasing is good for short duration trading.

Stock price graph for 15-minute windows were used a lot when observing the trend of the stock price within the day.

The simulation also went under a very special event, the election, for one week, which effect last for almost two weeks. After the election night result, the stocks kept decreasing to 10% of opening prices; this is when trader made purchasing decision. However, it slowly came

back when people are calm with the Election result, which result in a huge profit during those two days. Therefore, day trading is greatly affected by new and events, however, even though over those two days, the close-market stock prices were all red, trader made huge profit.

In conclusion, the simulation went well, not only does it returns a profit, but it also helped trader, me, understand a lot more about stock market. Even though the simulation returns almost 10% profit, I still think it is a good thing not to invest real money. The decision of when to purchase a stock has too much pressure because it will determine whether the trade is lost or not, the pressure of losing thousands of dollar in a few hours is still very difficult to handle.

## **5. Swing Trading**

### ***5.1. Simulation Goal***

Unlike long term stock trading, swing trading happens faster. In a week there might be 2-3 trades. Therefore, the goal after this simulation is gaining 10% of the amount I invest in the market which will be \$200 000.

10 percent of the investment seems to be not much. But comparing to long term trading, swing trading takes more risks so there would be some trades you may take on loss and some trades you can make profit. In this I try my best to get as much profitable trades as I can.

### ***5.2. Strategy***

In swing trading, technical analysis is very important. From Dr. Melvin Pasternak lesson, I learnt that to be a competitive swing trader, I have to master chart reading, finding support and resistance, finding trend line. Other factors like news, things that happen every day that affect the stock market, the most important factor for swing trader is only trend line. But nonetheless fundamental analysis should be taken into account.

Below are the four profitable chart patterns, the information was obtained from [18], respectively for swing trader from swing-trade-stock.com, they are T-30, Figure 5.1; Ghost town, Figure 5.2; swing trap, Figure 5.3; and Side trap, Figure 5.4, chart pattern:





*Figure 5.1 T-30 chart pattern*



*Figure 5.2 Ghost Town chart pattern*



Figure 5.3 Swing trap chart pattern



Figure 5.4 Side Trap chart pattern

For the first few trade, I'm going to use the ghost town chart pattern to trade, that is, when I see a narrow range candlestick, there will be a swing soon after that point, this is the point where I decide to buy or not to buy. Other type of chart pattern will be discussed in detail for the week simulation that has it.

Swing trading does not require high stock trading skills and can also make huge profit for advance stock traders. Here are some pros and cons of the technique.

### 5.2.1. Pros

- Does not have to be your full time job
- Potential for significant profit
- Doesn't have to be monitored constantly
- Doesn't require big amount of fund

### 5.2.2. Cons

- Higher margin requirement
- Risk of substantial losses

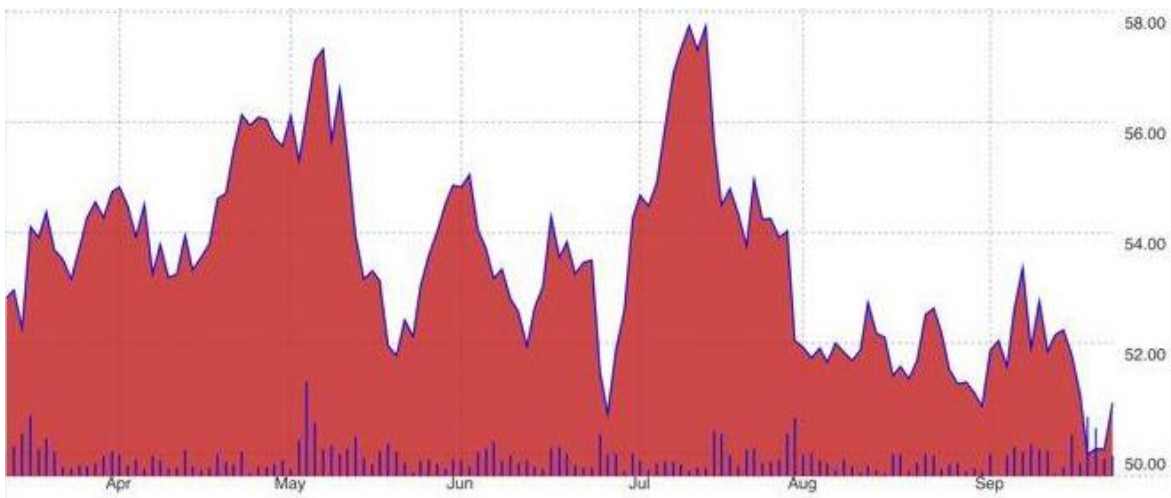
## 5.3. *Chosen Companies*

As discussed above, swing trader may hold his stock for at least one night so this technique is looking for companies that have high potential of creating volatility and high liquidity.

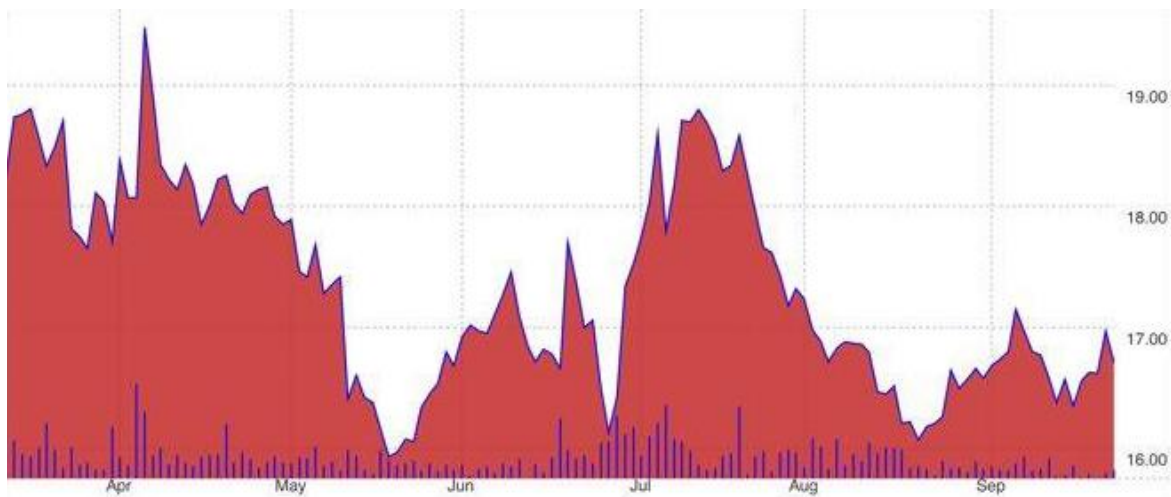
I need volatility because when the market's graph starts to go up and down, the pattern becomes like a zig zag trend, this is when swing trader can get in, they can recognize the bullish and bearish phase of the stock therefore trades will happen.

High liquidity is also important because swing traders need to set up their stop losses point where if the stocks go out of their hands, they can still sell it immediately to minimize losses.

As swing trader, like other type of trading technique, all factor like media, input costs, etc. affect the business but for this technique, graph is more useful so here are some companies that I will pay attention to most of the time but the rest will also be checked constantly to see if I can jump in and make profit. Therefore, the six chosen companies are: JP Morgan, Alibaba Group, CBS Corp, Facebook Corp, Tesla Motor Inc., Nike and Ennis Inc. Below are 6-month price stock charts of CBS, Figure 5.5, and Ennis Inc., Figure 5.6, respectively:



*Figure 5.5 CBS corp ( American Mass Media Corp)*



*Figure 5.6 Ennis Inc ( Professional Stylist )*

So as we can see on the graph, there are some significant volatility and up and down trend happens obviously. I choose 6 months' graph because it is a decent time length for me to see the situation the company is in and to predict that I can swing trade with these companies.

## 5.4. Simulation

### 5.4.1. Week 1:

For the first week of simulation, I decided to go safe, spent fifty thousand dollars in total out of my two hundred thousand budget.

Among the six chosen companies of mine, I checked the first month stock graph and saw some zig zag pattern, using the Ghost Town chart pattern which says whenever there is a low range candlestick, a counter trend may occur, therefore I spent approximately 20 000 USD on CBS and Facebook, only about 10 000 USD on Tesla. The detail will be given later in this report. Figure 5.7 gives a 1-month price stock chart of CBS:

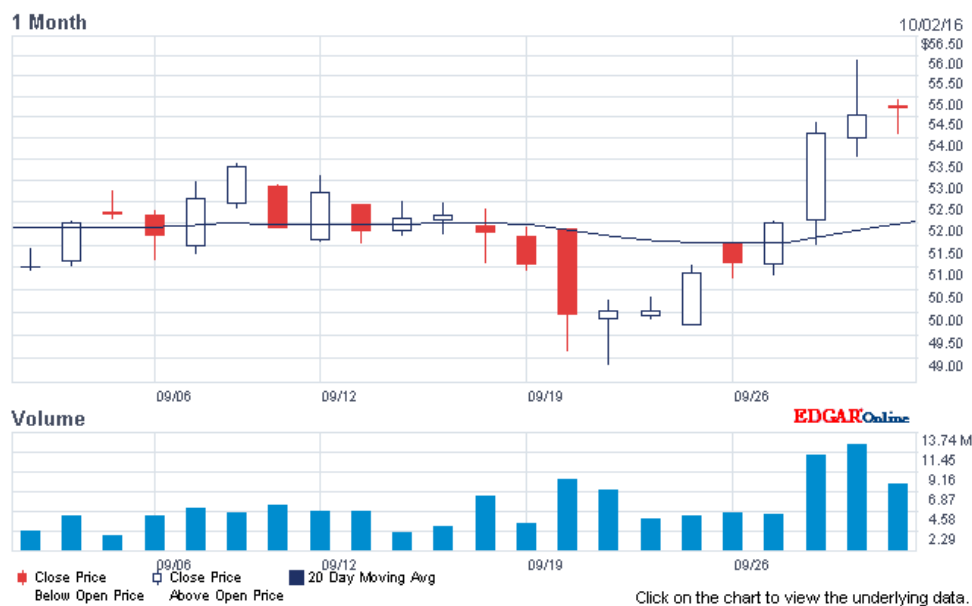


Figure 5.7 CBS

For the following few days, I saw that the candlestick range was getting narrow after a big change in price, I decided to sell all of my stocks at 55 USD. And I finally I put some profit into my pocket. Figure 5.8 below is a 1-month price stock chart of Facebook:



Figure 5.8 Facebook

For Facebook, the zig zag pattern also occurs instantly and applying ghost town chart pattern, I bought about 20 000 USD of stocks and sold it on 29th September. I was lucky that after that hammer candlestick, the price dropped. Below is Figure 5.9 which gives a 1-month price stock chart of TSLA:



Figure 5.9 TSLA

For Tesla, also again, the candlestick range, it was narrow on 28th September so I spent about 10 000 USD on it, it got narrower than the previous day, I guess there will be a counter trend but I don't know would it raise or it will drop even lower so I decided to sell, for this time, I loss some money. Below is Table 5.1, the detail week 1 trading summary table:

Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
09/25/2016							200000	
09/26/2016	CBS	Buy	51	392	20002		179998	
09/27/2016	FB	Buy	127	157	19949		160049	
09/28/2016	TSLA	Buy	206	48	9898		150151	
09/29/2016	CBS	Sell	55	392	21570	1568	171721	1568
09/29/2016	FB	Sell	128	157	20086	137	191807	1705
09/30/2016	TSLA	Sell	204	48	9782	(116)	201589	1589

Table 5.1 Week 1 trading summary

To calculate the percent of net profit, I use:

$$\frac{\text{Total get back} - \text{Total Invest}}{\text{Total Invest}} \times 100 \quad (5)$$

If the result is negative, I have lost some money, if the result is positive, I have made some profit. The result is in percentage  $\frac{(21560+20096+9792)-(19992+19939+9888)}{(19992+19939+9888)} \times 100 = 0.0327\%$

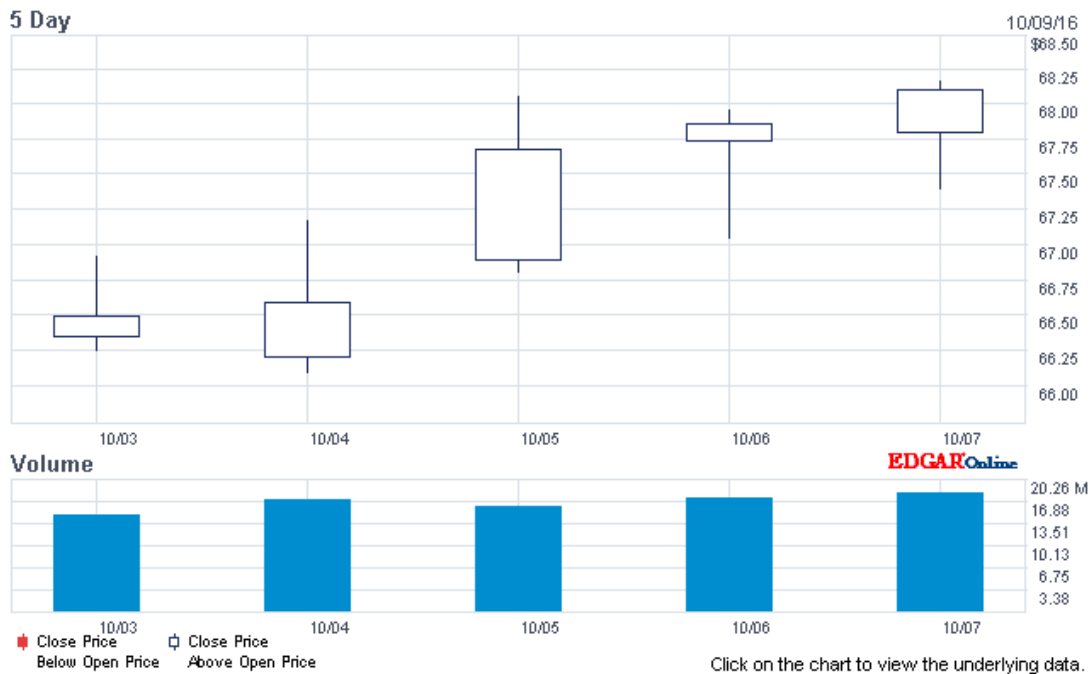
#### 5.4.2. Week 2:

For this week, I used the same method as last week which was using the ghost town chart and zig zag pattern as well as the range of the candlestick to decide which company to invest in.

After following the chart for a few days, I decided to go for JP Morgan (JPM), Virgin America Inc. (VA), Alibaba group (BABA), and Facebook Inc. (FB). Although Virgin America was not in my chosen companies list, but as stated earlier, the rest companies beside chosen companies will be checked instantly. For this week I used 150 000 USD out of my 200 000 budget. The net profit of previous week is separated from the investment budget.

First of all, I will start with JP Morgan (JPM), Figure 5.10 is the graph of 5 days for JPM:





*Figure 5.10 Five days for JPM*

For this company, on Monday the third of Oct, I saw a low range candlestick but I hesitated. Then on the 6th Oct, the low range candlestick appeared again, this time I decided to give it a shot. But because I was not so sure about what would happen later, I only invested 20 000 USD on this. But it turned out that the stock grew on the 7th Oct.

Next, let's talk about Alibaba Group (BABA), Figure 5.11 below is 5-day stock price of BABA:

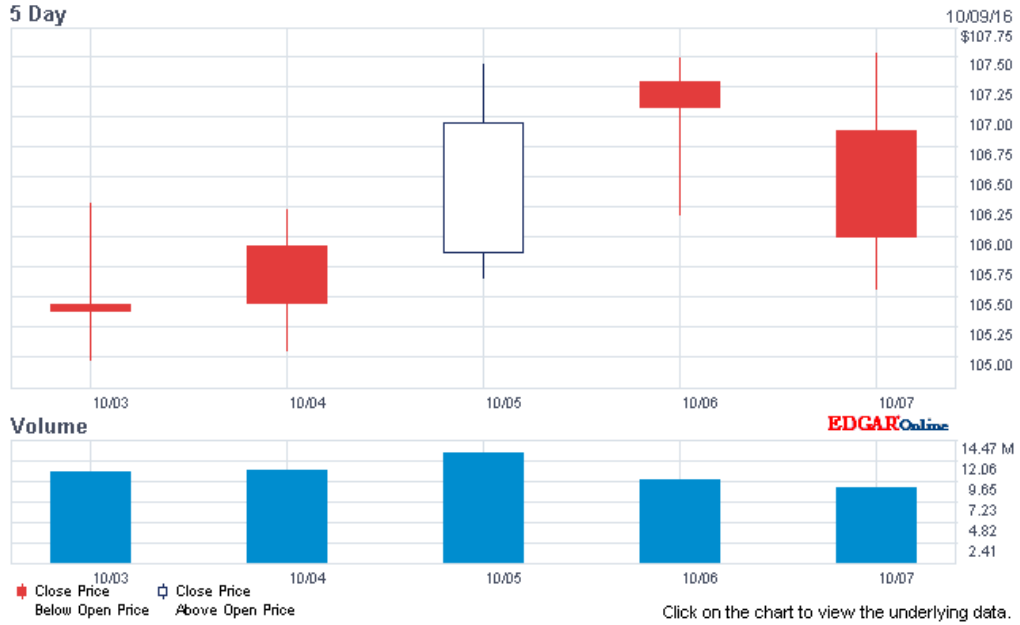


Figure 5.11 Alibaba Group

This time, for this company, I made a wrong decision.

However, I earned back some profit from Facebook (FB), 5-day price stock chart is given below in Figure 5.12:

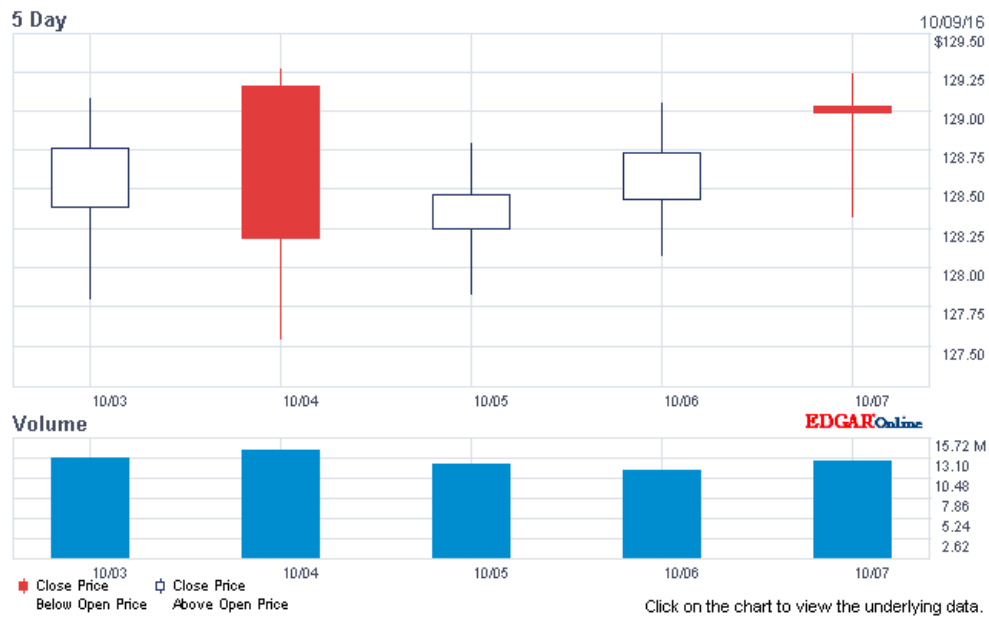


Figure 5.12 Facebook

Same way I did before, low range candlestick was on the fifth of Oct. the next day, stock price went up, I sold immediately to get some profit in case I lose my money on the other investment. It turned out that I did cover some of the lost from Alibaba Group.

Finally, Figure 5.13 shows 5-day price stock chart of Virgin America:

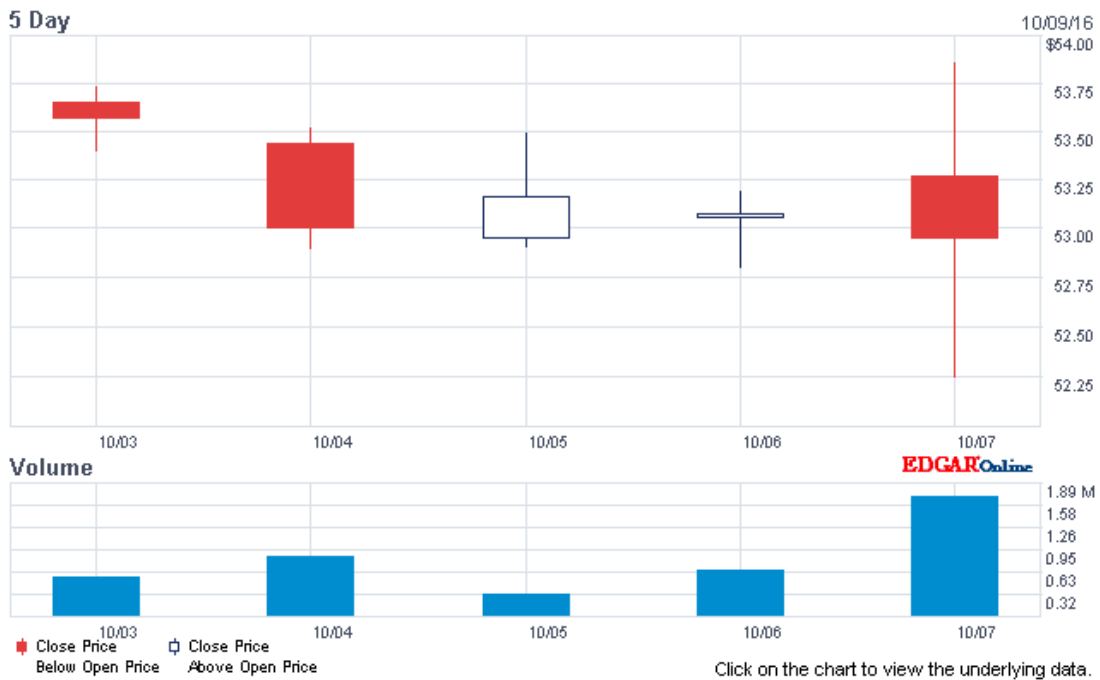


Figure 5.13 Virgin America

On the 5th Oct, I traded but the next day the price drops, it increased again on the 7th but I don't know what would happen on the weekend when the market is closed and the pattern didn't appear so clearly for me so I decided to sell. Below is Table 5.2, week 2 trading summary table:

Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
10/5/2016							200000	
10/05/2016	FB	Buy	128.03	390	49941.7		150058.3	
10/05/2016	VA	Buy	53	943	49989		100069.3	
10/06/2016	JPM	Buy	67.5	296	19990		80079.3	
10/06/2016	BABA	Buy	107	280	29970		50109.3	
10/06/2016	FB	Sell	128.7	390	50183	241.3	100292.3	241.3
10/07/2016	JPM	Sell	67.7	296	20029.2	39.2	120321.5	280.5
10/07/2016	BABA	Sell	106.6	280	29838	(132)	150159.5	148.5
10/07/2016	VA	Sell	53	943	49969	(20)	200128.5	128.5

*Table 5.2 Week 2 trading summary*

To calculate the result, I use equation (5) to calculate:

$$\frac{\text{Total get back} - \text{Total Invest}}{\text{Total Invest}} \times 100$$

If the result is negative, I have lost some money, if the result is positive, I have made some profit. The result is in percentage  $\frac{(20039.2+29848+50193+49979)-(19980+29960+49931.7+49979)}{(19980+29960+49931.7+49979)} \times$

$$100\% = 0.0014 \%$$

#### 5.4.3. Week 3+4+5:

So for this week, I bought from Nike. I only spent 100 000 USD because from the week of break I spent 100 000 USD on Facebook and I just sold them this week.

Below are Figure 5.14: the chart of Nike for this week and Figure 5.15: the chart of Facebook for one month (so I can summarize and show the price because there is no option of graphing 2-week chart) and the price chart of Facebook.

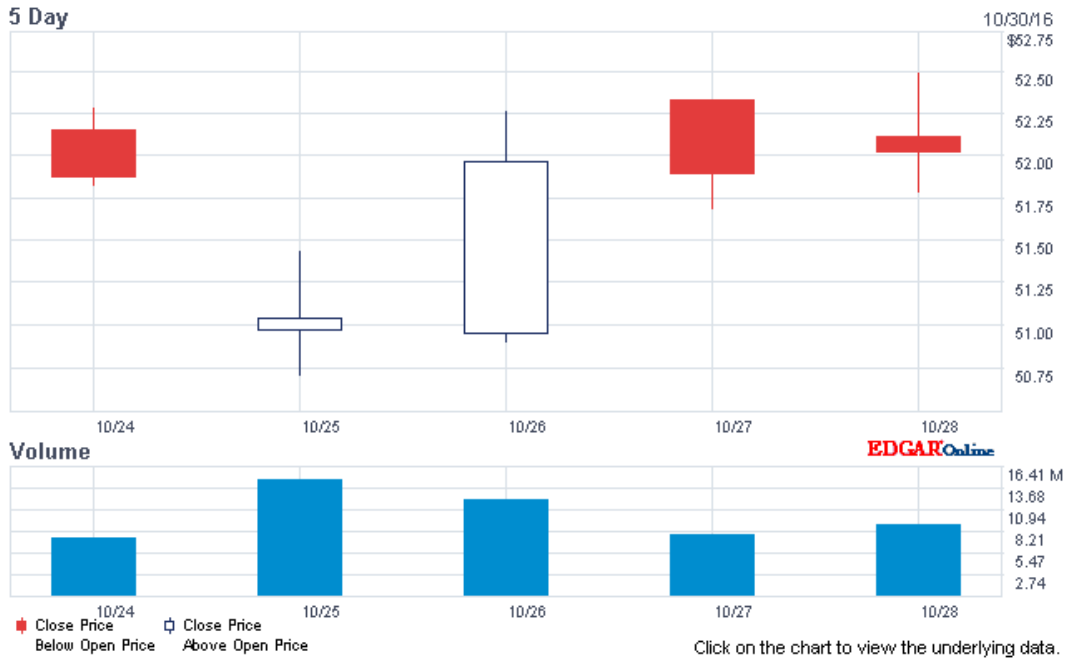


Figure 5.14 Week price chart for Nike

For Nike, I bought stocks on the 25th Oct at the price 50.93 USD. Because I saw the trend is raising so I planned to sell them later on but the price dropped on the 28th so I had to sell before it drops lower to minimize the loss or actually gained some benefit if possible. I spent about 100 000 USD for Nike. Detailed data will be given below in Figure 5.15, a 1-month price stock chart for Facebook.



Figure 5.15 Facebook

Table 5.3 below represents the price per share of Facebook.

Date	Open	High	Low	Close/Last	Volume
10/28/2016	130.50	132.97	129.93	131.29	24,500,920
10/27/2016	131.74	131.80	129.27	129.69	16,628,680
10/26/2016	131.64	132.26	130.935	131.04	13,066,210
10/25/2016	133.50	133.50	132.22	132.29	13,307,700
10/24/2016	132.72	133.405	132.15	133.28	17,420,290
10/21/2016	129.78	132.13	129.70	132.07	18,983,740
10/20/2016	130.07	130.66	129.50	130.00	13,148,980
10/19/2016	128.74	130.47	128.60	130.11	16,723,000
10/18/2016	128.68	129.39	128.01	128.57	13,487,280
10/17/2016	128.20	128.47	127.32	127.54	11,317,650
10/14/2016	128.49	128.95	127.58	127.88	13,335,970
10/13/2016	128.21	128.25	126.75	127.82	17,106,910

Table 5.3 Table of stock for Facebook

For Facebook, I spent about 100 000 USD on the 18th Oct at 129.06 USD and sold them just on the 27th of Oct because the price dropped. I sold them at 130.73 USD.

Below are the detailed week 3,4 and 5 trading summary in Table 5.4 and the profit/loss calculation:

Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
10/17/2016							200000	
10/18/2016	FB	Buy	129.06	774	99902.44		100097.56	
10/25/2016	NKE	Buy	50.93	1963	99985.59		111.97	
10/26/2016	NKE	Sell	51.05	1963	100201.15	215.56	100313.12	215.56
10/27/2016	FB	Sell	130.73	774	101178.02	1275.58	201491.14	1491.14

*Table 5.4 Week 3,4 and 5 trading summary*

I use equation (5) to calculate the net profit:

$$\frac{\text{Total get back} - \text{Total Invest}}{\text{Total Invest}} \times 100$$

If the result is negative, I have lost some money, if the result is positive, I have made some profit. The result is in percentage  $\frac{(100211.15+101185.02)-(99975.59+99892.44)}{(99975.59+99982.44)} \times 100\% = 0.0076\%$

#### 5.4.4. Week 6 simulation:

For this week, I bought from Nike, Facebook and CBS. The reason I bought from these companies was that I can see the pattern for it to swing. The other were also tradable but I only have 200 000 USD and there is 10 USD for commission fee already for each trade so I need to minimize those 10 dollars' fee. Also investing in one company increases the profit if the profit is high percentage because I see the pattern but who know when the trend will change.

Below is the chart of Nike for this week in Figure 5.16:

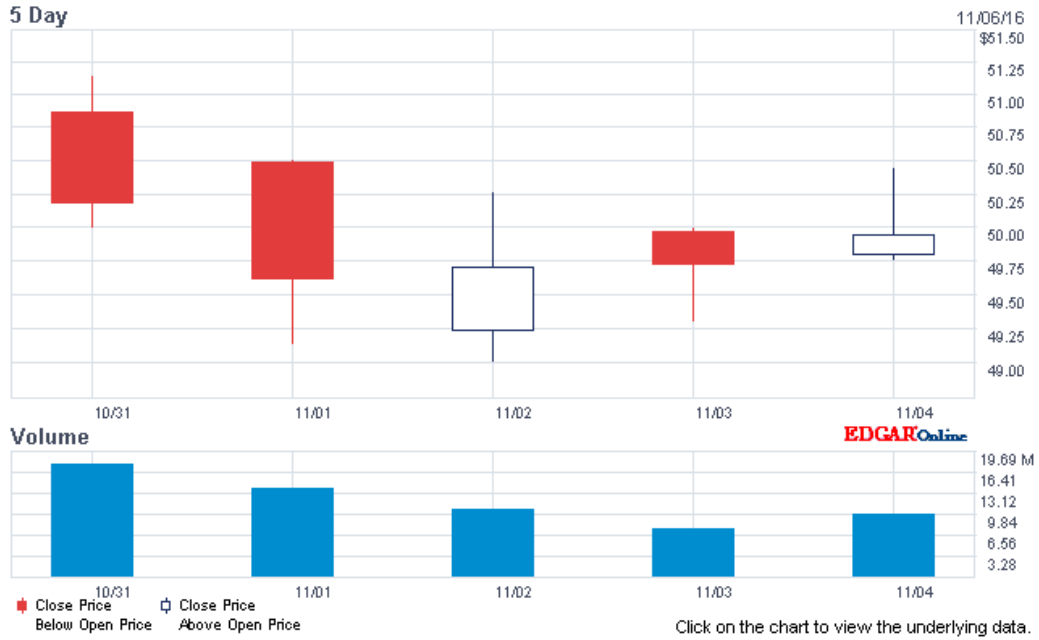


Figure 5.16 Nike

Realizing the trend went down on the first of November, I spent about 80 000 USD on this company. I saw that my prediction was not that accurate when on the next day the stock continued to drop. Next is Figure 5.17, the 5-day price stock chart of Facebook:

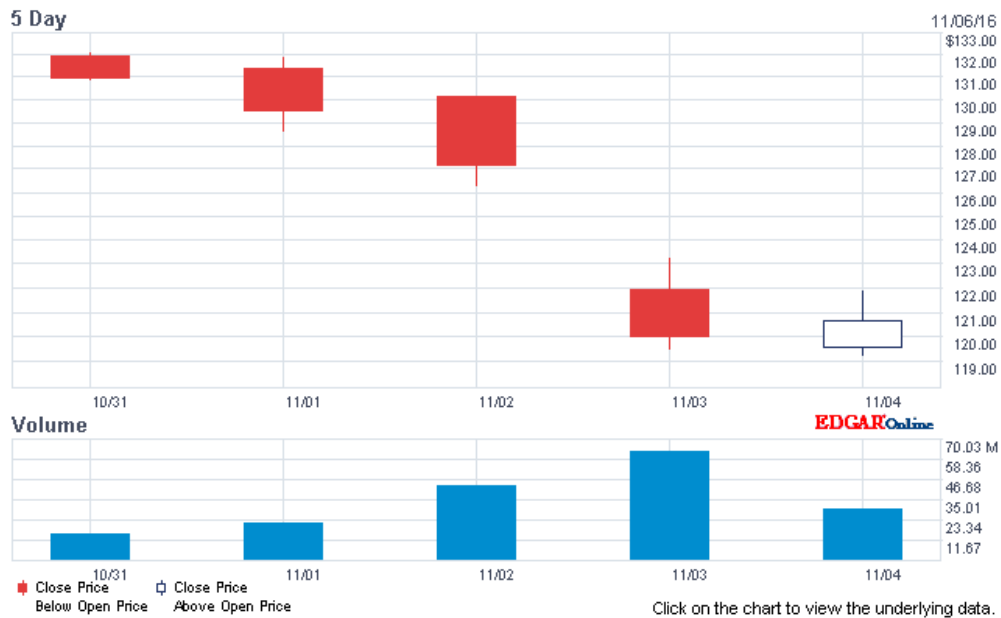


Figure 5.17 Facebook



This week I bought stock on the third of November but it dropped again the next day so I decided to keep the stock until next week to sell. Below is the price stock chart for CBS in Figure 5.18:

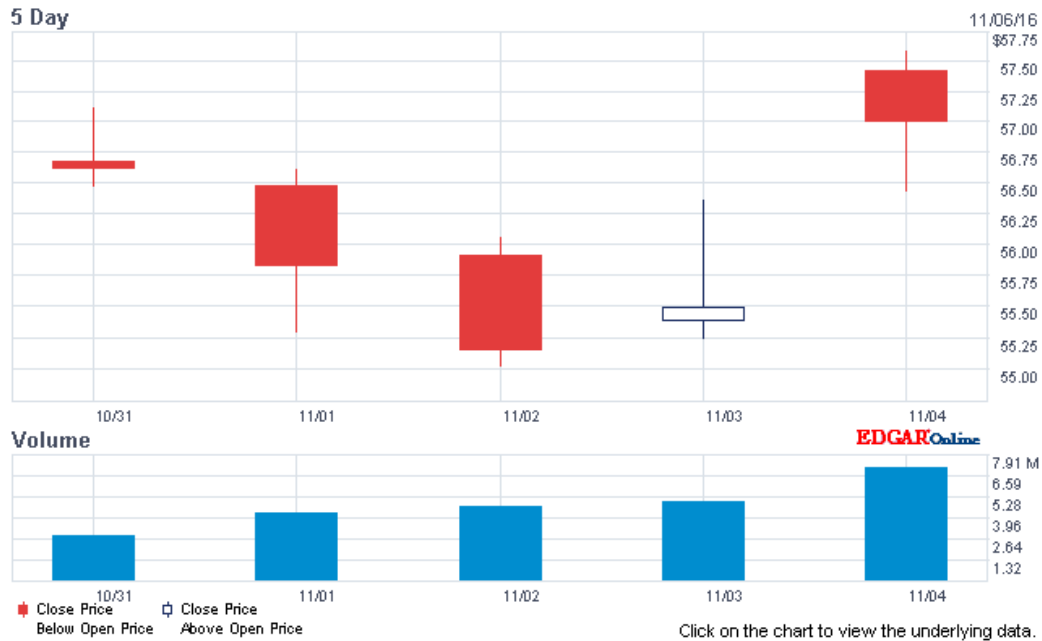


Figure 5.18 CBS

For CBS, I got quite a big amount of profit. The reason I don't set up stop-loss order is because unlike day trading, I can keep the stock for days to over a week so I might lose money this week but if I keep the stock for a while, the price may swing up.

Here is Table 5.5 for week 6 trading summary:

Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
10/31/2016							200000	
11/01/2016	NKE	Buy	49.33	1622	80023.26		119976.74	
11/03/2016	FB	Buy	121.25	490	59422.5		60554.24	
11/03/2016	CBS	Buy	55.37	500	27695		32859024	
11/04/2016	NKE	Sell	50.27	1622	81527.94	1504.68	114387.18	1504.68
11/04/2016	CBS	Sell	57.48	500	28730	1035	143117.18	2539.67

Table 5.5 Week 6 trading summary

5.4.5. Week 7 Simulation:

This week there is a date that attracts people all over the world’s attention, that is the US President Election day- November 8 2016. I know that whoever win this selection, there will be a huge change in market price, it’s either going up or going down.

From last week, I still have 490 shares that will be sold this week. So my plan was selling them on the November 8, if the price on this date goes up, I make profit, if it goes down, I still have to sell them because waiting to the next day is a big risk. Below is Figure 5.19, information of Facebook price stock chart for this week:

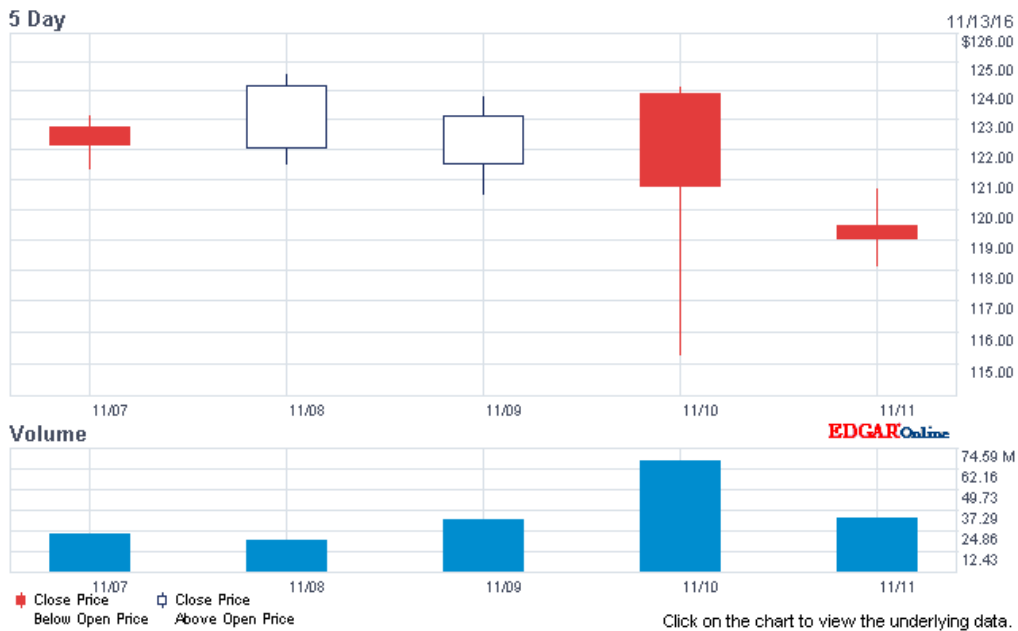


Figure 5.19 Facebook

This week, since the price is unpredictable, I decided to use only half of my budget, which is 100 000 USD, on the market. As usual, I choose Nike, Facebook and CBS to invest. I figure CBS will have the biggest change in price since this is a media group company. Below is the stock chart for CBS given in Figure 5.20:

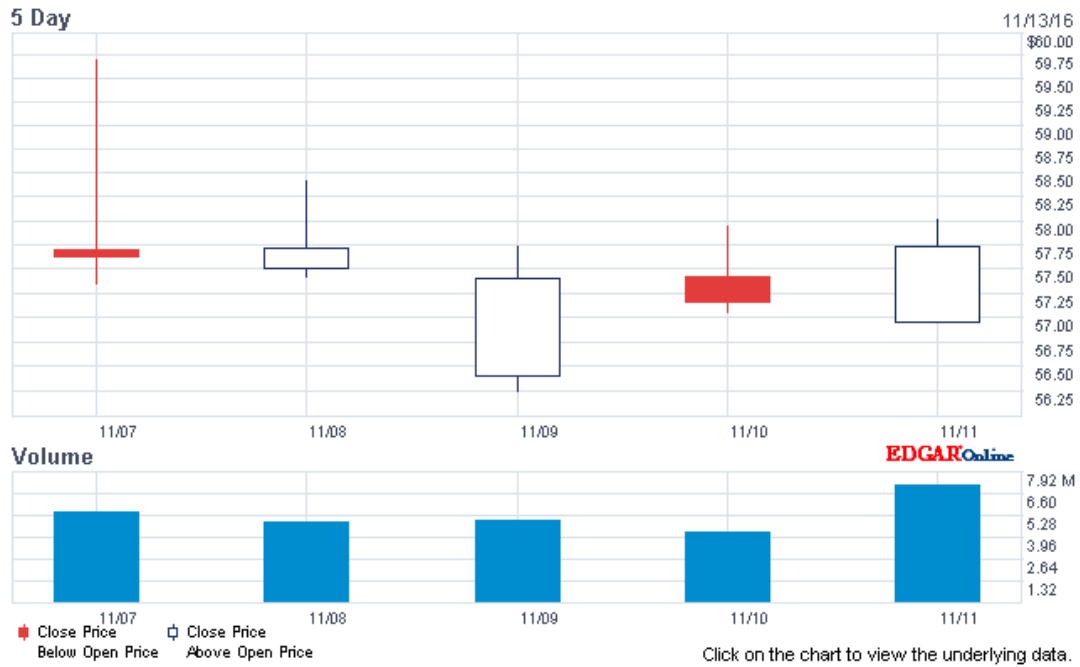


Figure 5.20 CBS

My guess seems to be right for only the day after the election day. Last but not least, Nike stock chart is given in Figure 5.21 below:

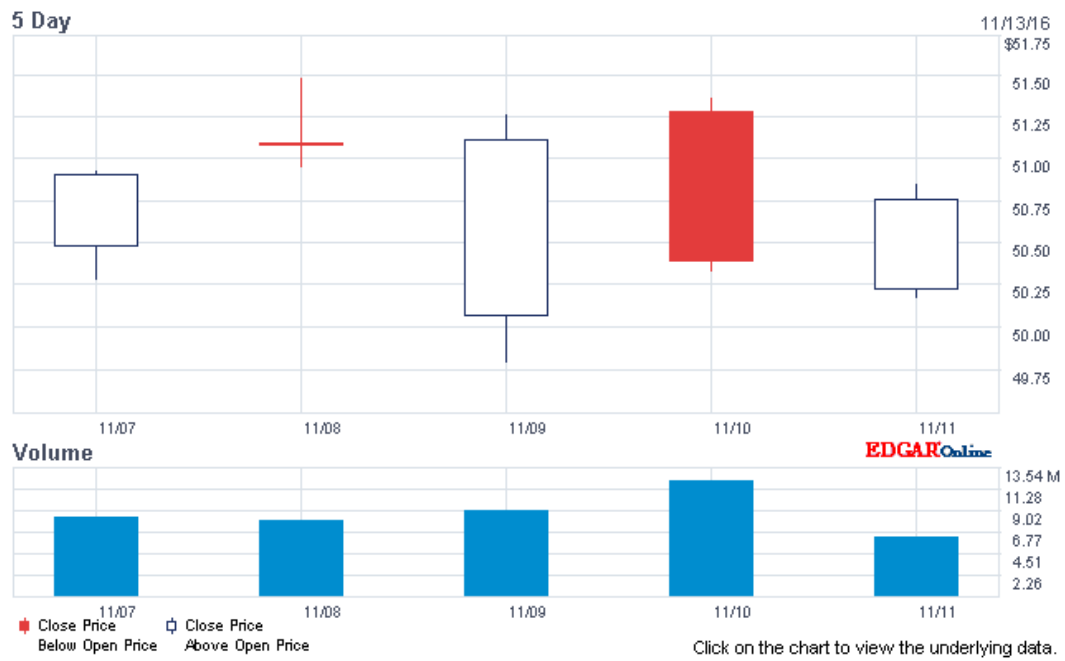


Figure 5.21 Nike

As I can see on the reported graph, Nike had the widest range candle stick in the market.

Below is Table 5.6, week 7 trading summary:

Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
11/07/2016							140577.5	
11/08/2016	FB	Sell	123.61	490	60558.9	1136.4	201136.4	1136.4
11/08/2016	NKE	Buy	51.45	972	50019.4		151127	
11/08/2016	CBS	Buy	57.64	867	49983.88		101143.12	
11/11/2016	CBS	Sell	58.03	867	50302.01	318.13	151445.13	1454.53
11/11/2016	NKE	Sell	50.82	972	49387.04	(632.6)	200832.17	822.17

*Table 5.6 Week 7 trading summary*

#### 5.4.6. Week 8 simulation:

For this week, since it is one week after the election day, my guess is that the price will be more predictable than last week, as normal, I check out the price for Facebook, Nike and CBS on the market as well as other seven companies. Among those, I chose only 2 companies which is Nike and Tesla.

The other companies, although they have up and down phases but they don't go in the pattern I need which is the zig zag pattern to show it is going to swing.

Below are Figure 5.22 and Figure 5.23 which give the 5 days reported chart for this week of Nike and Tesla respectively:

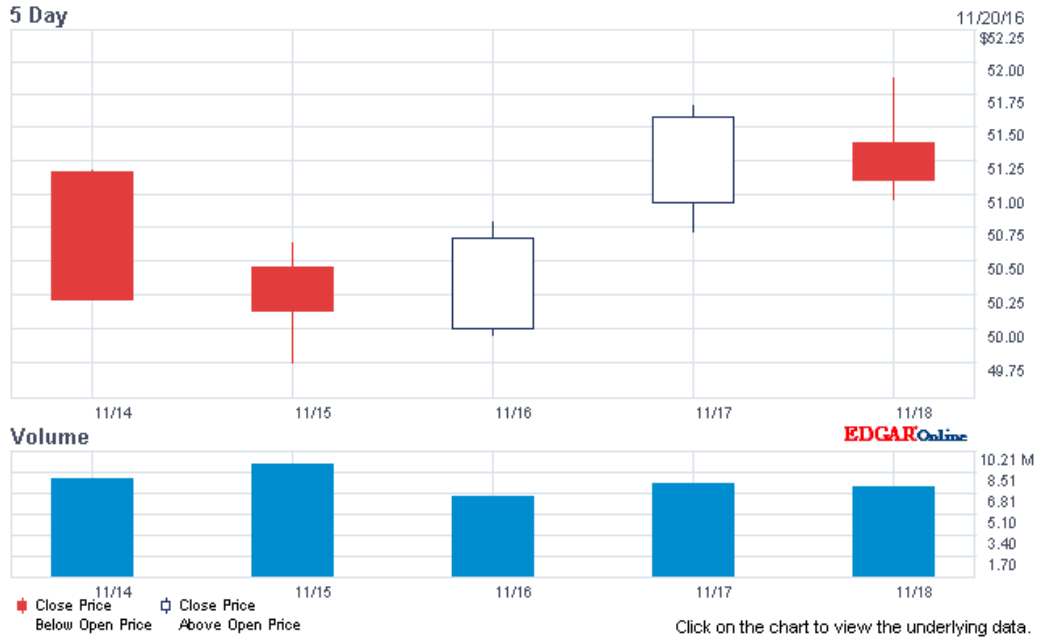


Figure 5.22 Nike

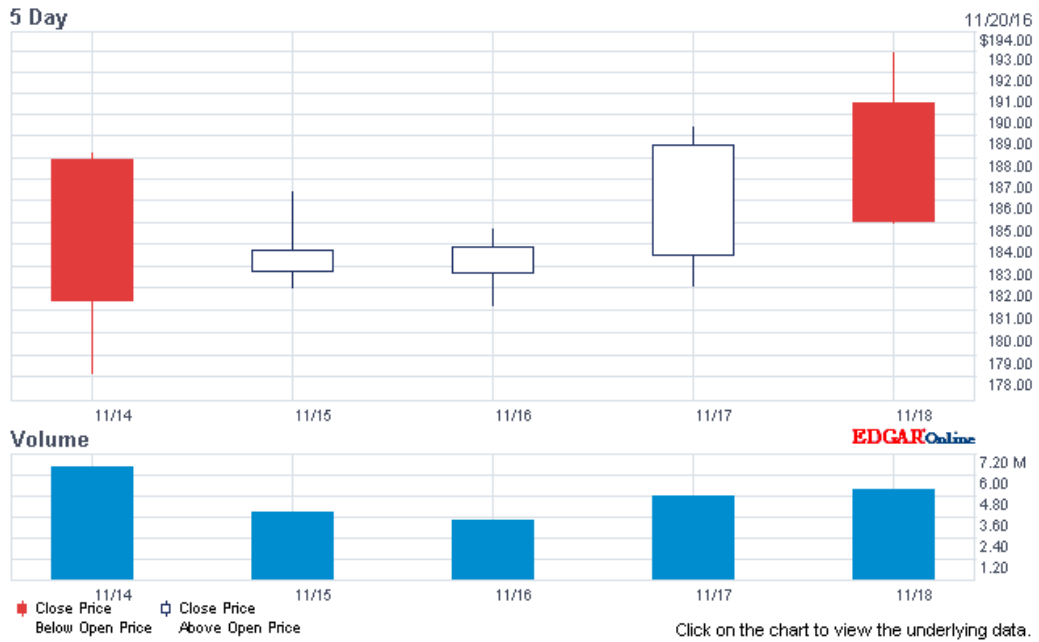


Figure 5.23 Tesla

As usual, I spent \$200 000 of my budget, half for each company, Table 5.7 below is the detailed week 8 trading summary:

Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
11/14/2016							200000	
11/16/2016	TSLA	Buy	182.65	548	100102.2		99897.8	
11/16/2016	NKE	Buy	50.45	1970	99396.5		501.3	
11/18/2016	NKE	Sell	51.69	1970	101819.3	2422.8	102320.6	2422.8
11/18/2016	TSLA	Sell	192.50	548	105480	5377.8	207800.6	7800.6

Table 5.7 Week 8 trading summary

For this week, I made a big amount of profit compared to last week. One reason is that I buy and sell stock within a week to get back the money, unlike last week I still kept the stocks from Facebook from the week before.

5.4.7. Week 9 simulation:

For this week, I spent all my budget on only two company that has the swing potential. They were CBS Corp. and Tesla. Below are Figure 5.24 and Figure 5.25 which show 5 days reported chart of CBS and TSLA respectively.

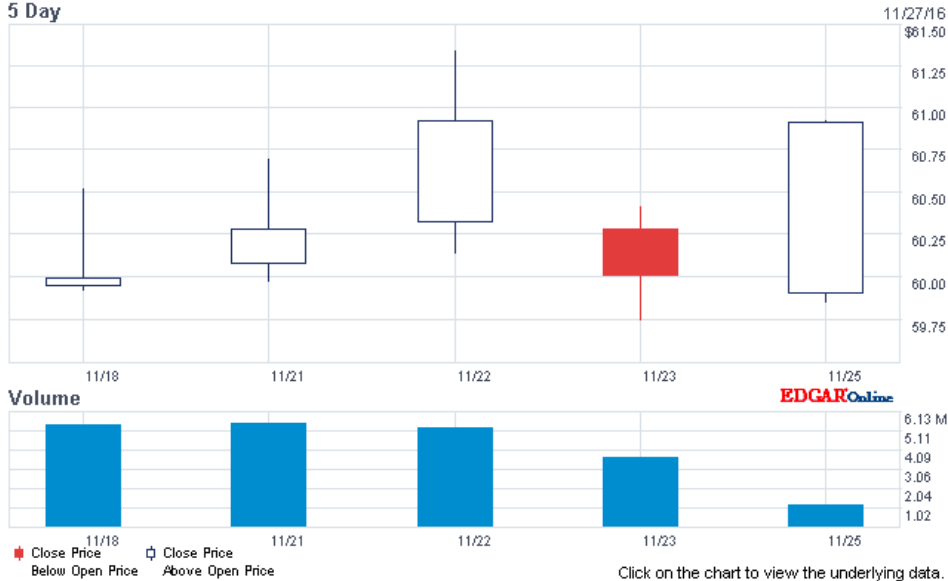


Figure 5.24 CBS

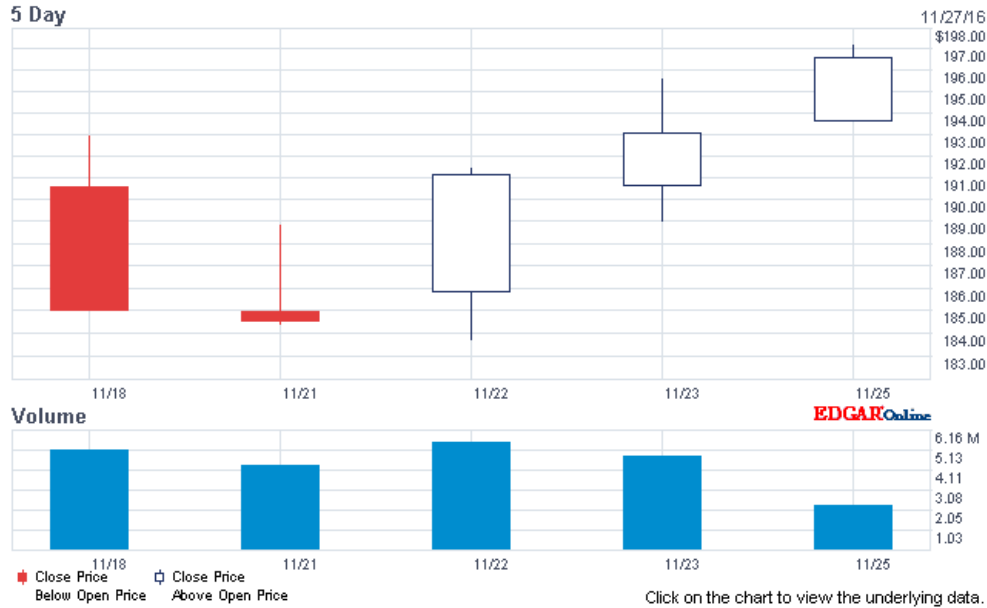


Figure 5.25 TSLA

Below is the Table 5.8 of week 9 trading summary:

Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
11/17/2016							200000	
11/18/2016	CBS	Buy	59.95	600	35980		164020	
11/21/2016	TSLA	Buy	186.33	300	55909		108111	
11/23/2016	CBS	Sell	60.39	600	36224	244	144335	244
11/25/2016	TSLA	Sell	195.63	300	58679	2770	203014	3014

Table 5.8 Week 9 trading summary

5.4.8. Week 10 simulation:

For this week, I invested in Nike and Facebook which I usually invest in, but this week I had a significant loss compared to simulations of the week before. Figure 5.26 and Figure 5.27 below shows 5-day chart of Facebook and Nike respectively:

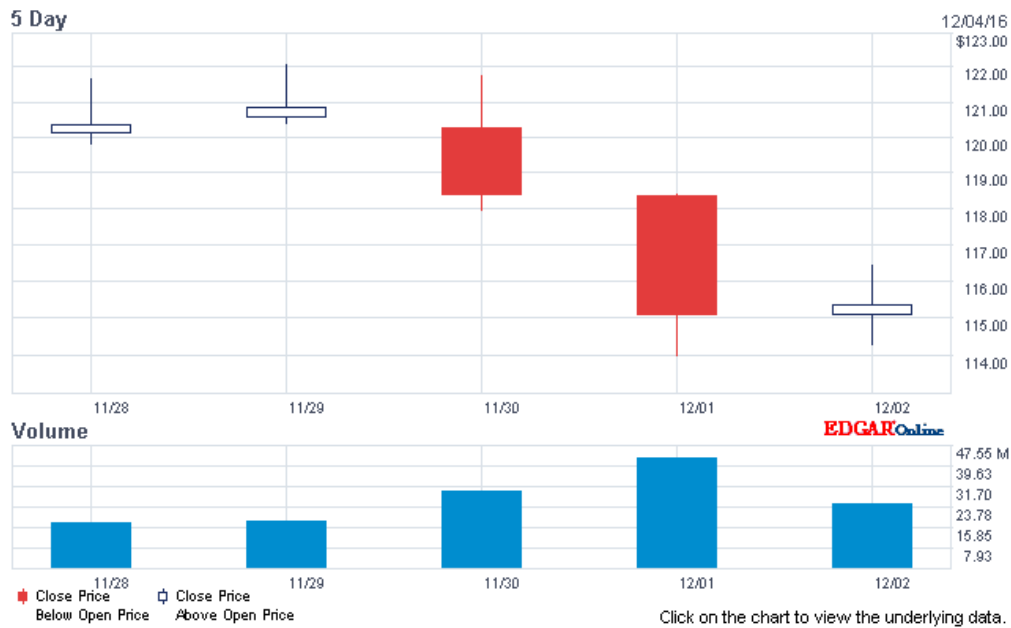


Figure 5.26 Facebook

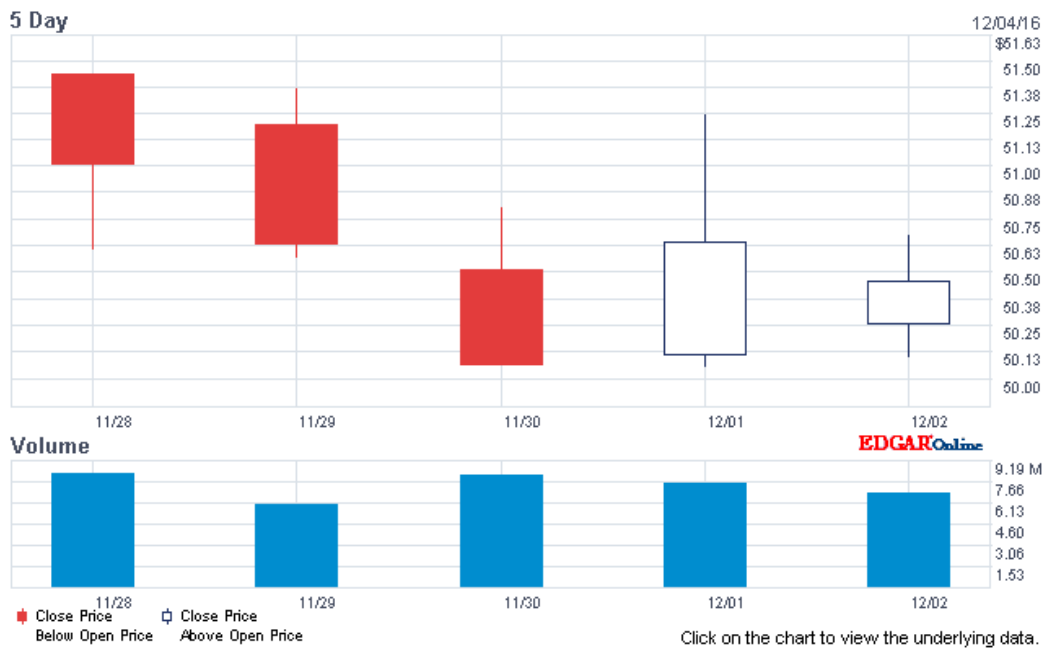


Figure 5.27 Nike

The loss here was with Facebook since I saw the candlestick which had a very low range on 11/28/2016 but it turned out to go down. Below is week 10 trading summary given in Table 5.9:



Date	Symbol	Buy/sell	Price (USD)	Share	Net cost/Proceeds	Profit/loss (USD)	Total cash (USD)	Total profit (USD)
11/27/2016							200000	
11/28/2016	FB	Buy	120.12	600	72082		127918	
11/30/2016	NKE	Buy	50.75	1000	50760		77158	
12/02/2016	FB	Sell	115.48	600	69278	(2804)	146436	(2804)
12/02/2016	NKE	Sell	50.66	1000	50650	(110)	197086	(2914)

*Table 5.9 Week 10 trading summary*

## 5.5. Strategy Conclusion

After 10 weeks of simulation, the total profit/loss I made is based on each week profit/loss accumulated so Table 5.10 below shows the total profit/loss of mine:

Week									
1	2	3	4	5	6	7	8	9	10
\$1589	\$128.5	\$1491.14			\$2539.67	\$822.17	\$7800.6	\$3014	\$(2914)
<b>Total profit/loss: 14471.08</b>									

*Table 5.10 Total profit/loss*

The total profit I made after 10 weeks of simulation in percentage is 5.788%.

The total profit percentage gained is not 10% which is the targeted goal. The obvious reason is that during the last week, the company that I usually invested on had the stock price changed unpredictably. Also, logistic skill and predicting what will happen based on news are also important and I'm not mastered at them yet. Full time stock investor has his sight on the stock market exchange for all day long to be able to catch up with every changes to be able to make quick decision.

Overall, I think 5.788% of profit is good enough for a beginner.

## **6. Penny Stock Trading**

### ***6.1. Simulation Goal***

We already knew that Penny Stock trading is risky business among all the trading techniques and options available out there in the market. Of course, along with the high risks come the high rewards of penny stock trading. Therefore, this is a really good method to gain good profit with a smaller starting budget. Similar to any other stock investment option, there is no possible way to exactly calculate what will happen and no any certain rule to ensure a profit to your investment. However, with a clear plan with key rules, a clear mindset, and hopefully a little bit of luck, you can expect to make good profit from your investment.

At the end of this simulation, the goal is to maximize the profit from the original budget of 50,000 dollars. Even more importantly, we hope to gain a more thorough understanding of the behavior of small-cap stocks, more skills in entering and exiting the market at the right time and a good mindset in stock trading.

### ***6.2. Strategy***

For this simulation, I will choose stocks from six different companies that are divided into three groups of two companies. Each group is from a different exchange: the OTCQX, OTCQB and NASDAQ.

NASDAQ is the second largest exchange in the world and companies qualified for NASDAQ have to pass high financial standard. Although technically, stocks from official exchanges are not considered actual “penny stock”, I stick to stocks which are under \$5 from

smaller companies and share many qualities with penny stocks. The stocks from NASDAQ might not have the highest chance of bringing in large sum of profit in a short period of time, but they are the safest compared to the long list of Over the Counter (OTC) Stocks with full of sketchy companies.

OTCQX is one of the OTC stock marketplaces available. Companies qualified for OTCQX market must meet higher standard, like “demonstrate compliance with U.S. securities laws, be current in their disclosure, and be sponsored by a professional third-party advisor, ...”, the information was obtained from [19]. These qualifications make the stocks in this market more reliable, while still possess the high volatility nature of OTC stocks.

OTCQB is the market for mainly small-size, startup companies’ stocks with even higher fluctuation. Even though these companies do not meet the requirements for OTCQX market, they still need to meet certain standard, undergo yearly verification, and especially must not be on the verge of bankruptcy. Stocks coming from this market might be the riskiest out of the chosen portfolio, but the companies are carefully chosen to minimize these risks. They both seem to be legitimate business with fairly high market capitalization and offer lucrative opportunities for investors.

There is another marketplace available, which is the Pink Sheet. I do not pick any stock from this exchange, because companies on Pink Sheet do not have to meet any minimum financial standard, some even have no information disclosed at all. There are too many risks investing in such stocks so I decided to skip this market.

The factor that is even more important than volatility in penny stocks is liquidity. Some companies on the OTC market have rather small market cap and share volumes. Even with a

lower budget, small investors can still be able to get a big chunk of stocks from these companies and affect the price of the stocks. Nevertheless, when staying in a large position, you cannot easily find buyers willing to take up your shares and exit when the opportunity comes. The key in stock trading is being able to buy and sell quickly at the right moments, therefore choosing a stock with high volatility but too low liquidity can be a huge mistake. In this simulation, I only choose companies with rather high market cap and share volumes compared to others in the OTC market (dollars volume is a few million dollars and up) and take a small position in each company to avoid ending up with a bunch of losing stocks that I cannot sell.

For this simulation, I plan to choose short-term investment strategy. I will constantly update the price of stocks and try to make a move every few days. I have no unrealistic intention of getting an enormous return for my trades and sell the stock as soon as it makes an all right return, even only just several cents per share. I also spread out my investment to a range of stocks with different level of risks, and stick to penny stocks with predictable patterns.

## ***6.3. Chosen Companies***

### ***6.3.1. General Cannabis Corp (OTCQB Stock-CANN)***

General Cannabis Corp is a company specialize in cultivate, produce and distribute products related to cannabis. It is one of the service providers available to the regulated Cannabis Industry. The company has four different subsidiaries, including a cannabis consulting system regarding large-scale agricultural project, a cannabis art, apparel and garments line, a security and training service and a brand development and design to the legal cannabis market. The company and all of its subsidiaries are founded and based in Colorado, USA.

Figure 6.1 below shows the stock price of General Cannabis from the past one year (09/2015 – 09/2016):



*Figure 6.1 Yearly CANN Stock taken from Yahoo Finance.*

CANN has a market capitalization of 47.29 million dollars and average trading volume per day of 741, 671, making it one of the most active stocks under five dollars available on OTCQB. Over the past year, CANN have had stable fluctuation with still enough volatility to make profit in short term period. Apart from that, the market of cannabis is currently very promising, creating hope that stocks will soon rise up.

### 6.3.2. Fannie Mae (OTCQB Stock-FNMA)

Fannie Mae is a government-sponsored enterprise (GSE). It is one of the safer companies available in the OTC Market. Fannie Mae is one of the oldest companies on OTCQB, the main exchange for young and startup stocks, and was founded in 1938 by Franklin Roosevelt in Washington DC. As a GSE and public company with a long history, Fannie Mae is a legitimate stock with less risk and high liquidity that I could find in OTCQB marketplace, in spite of the

fact that the return is slightly lessen compared to other stocks. Fannie Mae, along with Freddy Mac, are two of the leading source of financing for mortgage lenders, providing accessible to many Americans every year.

Figure 6.2 below shows the stock price of Fannie Mae from the past one year (09/2015 – 09/2016):



*Figure 6.2 Yearly FNMA Stock taken from Yahoo Finance.*

Fannie Mae has a market cap of 10.1 billion dollars and more than 1.3 million shares. FNMA is also one of the most active stocks in the OTC Market. Throughout the past year, FNMA stock has been quite stable with constant fluctuation. After the market crash of 2008, FNMA Stock has dropped significantly and only rise upward again since late 2013. I believe that with this trend, FNMA Stock will have possibilities of going up when the housing market is once again popular.

### 6.3.3. Novavax (NASDAQ Stock-NVAX)

Novavax, Inc. is a clinical-stage vaccine company and their vaccine's main target is different kind of infectious diseases. Their product pipeline aims at "a variety of infectious diseases with vaccine candidates currently in clinical development for respiratory syncytial virus ("RSV"), seasonal influenza, pandemic influenza, and Ebola virus ("EBOV)". They also have a range of different clinical trials for different infectious diseases. Novavax's headquarter is in Gaithersburg, Maryland with over 500 employees.

Figure 6.3 below shows the stock price of Novanax from the past one year (09/2015 – 09/2016):



*Figure 6.3 Yearly NVAX Stock taken from Yahoo Finance.*

Novavax Inc. has a market cap of 612.19 million dollars and 70, 179, 532 shares available on NASDAQ exchange. The company's stock has been quite stable for the past few years until a recent strong drop due to a vaccine's dismal failure scandal. Since the huge drop, the stocks have

begun to rise up again, quite sharply. I believe that NVAX will continue to rise in the near future and would be a potential stock to bring in goof profit in this simulation.

#### 6.3.4. Office Depot (NASDAQ Stock-ODP)

Office Depot is an American office supply retailing company. They have about 66,000 sale associates, and serves consumers and businesses in 57 countries with more than 2,000 retail stores (including Office Depot, OfficeMax, OfficeMax Grand & Toy, Reliable and Viking.) The company also has an award-winning e-commerce website and is considered as Staple’s big rival. Office Depot’s global head quarter is currently in Boca Raton, Florida, after its merge with Office Max in 2013.

Figure 6.4 shows the stock price of Office Depot from the past one year (09/2015 – 09/2016):



*Figure 6.4 Yearly ODP Stock taken from Yahoo Finance.*

Office Depot has market capitalization of 2.02 billion dollars with share volume of 11,804,558. For the past year, there was a sudden drop in ODP Stock around May so I believe



this is a good time to buy in ODP Stock now and wait as there is high possibility that ODP will rise again in near future.

### 6.3.5. Nemaska Lithium Inc. (OTCQX Stock-NMX)

Nemaska Lithium Inc. is a lithium hydroxide and lithium carbonate supplier based in Canada. The main source of supply of the cooperation come from Quebec, one of the most important spodumene lithium hard rock deposit in the world, both in volume and grade. Lithium is a potential industry nowadays because the product is used to create lithium battery, used in a numerous technology development including electric vehicles, cell phones, tablets and other consumer products.

Figure 6.5 below shows the stock price of Nemaska Lithium Inc. from the past one year (09/2015 – 09/2016):



*Figure 6.5 Yearly NMX Stock taken from Google Finance.*

Nemaska Lithium Inc. has market cap of 305.06 million Canadian dollars and 252.43 million share volume. Looking at the stock chart of NMX for the past year, I can see the price have increased significantly due to the increase market demand for lithium battery in different products. The slight drop in the past month is a good time for buying NMX for this simulation.

### 6.3.6. Atlas Energy Group (OTCQX Stock-ATLS)

Atlas Energy Group, LLC is a publicly traded master limited partnership. It specializes in mining crude oil, natural gases and natural gas liquids production activities. The company owns over 14, 000 gross wells across 17 States. As of July 1, 2016, the company reserve report estimates the present value of those reserves to be \$832 million. The company is one of the leading sponsor and manager of “Drilling Partnership”.

Figure 6.6 below shows the stock price of Atlas Energy Group from the past one year (09/2015 – 09/2016):



*Figure 6.6 Yearly ATLS Stock taken from Yahoo Finance*

Atlas Energy Group, LLC. has a market cap of 38.8 million dollars and 222,860 million in share volumes. Looking as the stock charts from the previous year, we can see that Atlas Energy Group’s is highly volatile with strong decreases in the stock price from December 2015 to late August 2016. I choose ATLS because I expect it will further pick up in short future. ATLS is

also one of the top 50 most active stocks recently in the OTC market so I want to try out a highly volatile stock like ATLS to try and make profit in short-term investment

## ***6.4. Simulation***

### ***6.4.1. Getting Started:***

At the beginning of the week of September 26, 2016 to September 30, 2016, I decided to made my initial stock purchase with the total budget of \$55, 000 dollars. I invested \$50, 002 in six different stocks divided in to 3 groups. From the table below, the yellow section indicated stocks from OTCQB Market, the green section indicated stocks from NASDAQ and the blue section indicated stocks from OTCQX market. The total budget minus the amount invested in stocks and an extra commission fee taken into account, leaving me with a total of \$6, 936 of liquid cash. The amount of money chosen to invest in each stock is based on the total market cap of the company, the liquidity of the stocks, positive short and long-term trend based of MACD indicator.

Table 6.1 shows my initial penny stock purchase table with the detailed information mentioned above.

	Date	Action	Stock	Price	Shares	Net Cost
	9/26/16	Buy	FNMA	\$1.71	4678	\$8,004
	9/26/16	Buy	CANN	\$1.46	6850	\$10,006
	9/26/16	Buy	NVAX	\$2.31	4330	\$10,007
	9/26/16	Buy	ODP	\$3.61	2770	\$10,005
	9/26/16	Buy	NMX	\$1.09	4860	\$5,302
	9/26/16	Buy	ATLS	\$1.45	3265	\$4,739
Total						\$48,063

*Table 6.1 Table of initial penny stock investment*

#### 6.4.2. Week 1 (09/26/2016 – 09/30/2016)

For the past week, the stock with the most positive trends is CANN. CANN opens with the price of 1.60 dollars per share and rises up to 1.91 dollars per share by the time the market closes on Friday, Sept 30<sup>th</sup>, 2016. This is a rise of almost 19.375 percent, bringing in a good amount of profit this week.

FNMA had a good increase at the beginning of the week, going from \$1.72 when the market opened Monday to the highest of \$1.8 on Tuesday's evening but has been dropping since and reached \$1.69 at the end of the week.

Contrary to the previous week good trend, NVAX has been going downwards since the beginning of this week. The stock opened at \$2.29 and also had a slight rise to \$2.44 the highest on Tuesday morning but dropped significantly on Tuesday's noon to \$2.16. NVAX decreased ever since although it did have a slight rise at the end of the week, closing at \$2.08 when the market closed on Friday.

ODP opens at \$3.68 per share on Monday but the stock continuously decreases over this week with a significant drop on Tuesday's noon, to \$3.51 dollars. ODP rises up for a short time on Wednesday to \$3.65 but dropped again to \$3.57 at the end of this week.

Contrary to ODP, NMX shows continuously positive upwards trend this week, rising from \$1.09 to \$1.20. There were nearly no significant drops at all for NMX. The chart for NMX was an almost linear line with positive slope for the 5 days from Sept 26<sup>th</sup>, 2016 to Sept 30<sup>th</sup>, 2016.

ATLS is the stock with the most interesting patterns this week. It opens at \$1.43 dollars on Monday and continues to rise up to a good \$1.88 per share. However, it plunges 42% on Wednesday, going down to only \$0.83 per share. This is due to the fact that the company is under an investigation into allegations of insider trading.

Considering all the given data, Table 6.2 below shows all my Week 1's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
9/26/16	Buy	FNMA	\$1.71	4678	\$8,004	0	\$46,996	0
9/26/16	Buy	CANN	\$1.46	6850	\$10,006	0	\$36,990	0
9/26/16	Buy	NVAX	\$2.31	4330	\$10,007	0	\$26,982	0
9/26/16	Buy	ODP	\$3.61	2770	\$10,005	0	\$16,978	0
9/26/16	Buy	NMX	\$1.09	4860	\$5,302	0	\$11,675	0
9/26/16	Buy	ATLS	\$1.45	3265	\$4,739	0	\$6,936	0
9/30/16	Sell	NMX	\$1.20	2500	\$2,995	\$270.00	\$9,931	\$270.00
9/30/16	Sell	CANN	\$1.93	4000	\$7,715	\$1,875.00	\$17,646	\$2,145.00

*Table 6.2 Table of trading actions by 09/30/2016*

This week, I decided to sell 4000 shares of CANN and 2500 shares of NMX, both on Friday, Sept 30<sup>th</sup>, 2016. This brings my total stock assets down to \$ 39941.47 and my liquid cash total to \$15,618. In conclusion, I made a net profit of \$659.

### 6.4.3. Week 2 (10/03/2016 – 10/07/2016)

For the week of October 3<sup>rd</sup>, 2016, the stock with the most positive trend is FNMA. At the start of the week, FNMA open at \$1.68 on Monday and it has been going upward since, with the highest rate weekly at \$1.94 per share (Friday, Oct 7<sup>th</sup>, 2016). The sudden high rate on Friday may be due to the fact that the company's economic and strategic research team received 2015-2016 NABE Outlook Award on the same day.

CANN continues to perform really well this week. It opens at \$1.97 on Monday and go up to a whopping \$3.05 per share on Tuesday's afternoon. Although CANN went down slightly after its peak, it still closed at a fairly good rate of \$2.45 per share by the time the market closes on Friday.

This week, NVAX continues to disappoint as it slowly dropped down since the opening of \$2.09 dollars per share at the beginning of the week. Despite the fact that there was a slight rise on Monday's afternoon when the stock went up to \$2.17, NVAX has been dropping down constantly until it closed at only \$1.8 on Friday. However, as these drops are partially due to the delay of the company 4<sup>th</sup> annual and analyst meeting, we hope that NVAX will still pick itself up in near future.

All the NASDAQ "penny stock" in my portfolio this week seems to perform quite poorly as not just NVAX, but also ODP had a very flat, slightly downward trend. Throughout the week, ODP fluctuates around \$3.5 to \$3.6 dollars per share, with no high volatility. The stock opens at \$3.58, had a slight rise on Wednesday to \$3.63 and continued to drop to \$3.53 by the end of Friday.

Completely different from last week, NMX continuously dropped since its opening, which is also the week's highest, at \$1.25 per share. By the time the market closes at the end of Oct 7<sup>th</sup>, NMX has dropped to only \$0.93 per share. However, this information makes it a good time to buy in some more NMX.

ATLS has gone up a fair amount since its 42% plunges 10 days ago. It was at \$1.5 when the market opens on Oct 3<sup>rd</sup>, had two good peaks on Tuesday and Wednesday at \$1.85 and \$1.86 respectively, the goes down slightly on Friday and closed off the week at \$1.63.

Considering all the given data, Table 6.3 below shows is all my Week 2's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
10/5/16	Buy	NMX	\$1.09	3000	\$3,275		\$14,371	\$2,145.00
10/5/16	Sell	CANN	\$2.58	2850	\$7,348	\$3,187.00	\$21,719	\$5,332.00
10/5/16	Sell	ATLS	\$1.71	2000	\$3,415	\$515.00	\$25,134	\$5,847.00
10/5/16	Sell	FNMA	\$1.75	678	\$1,182	\$22.62	\$26,316	\$5,869.62
10/5/16	Sell	ODP	\$3.53	770	\$2,713	-\$66.70	\$29,029	\$5,802.92
10/6/16	Buy	CANN	\$2.31	2500	\$5,780		\$23,249	\$5,802.92
10/6/16	Sell	FNMA	\$1.86	2000	\$3,715	\$295.00	\$26,964	\$6,097.92

*Table 6.3 Table of trading actions by 10/07/2016*

This week, I made a total of 7 trades, 5 on Wednesday Oct 5<sup>th</sup> and 2 on Thursday Oct 6<sup>th</sup>, both at the time between 3pm to 4pm. After these moves, my total liquid cash are up to 27 039 dollars and my total stock assets are down to 32, 785 dollars. This makes my total net profit this week \$4,165.

#### 6.4.4. Week 3 (10/10/2016 – 10/14/2016):

This week, 2 NASDAQ stock, NVAX and ODP, continued to drop ever since the initial purchase. Therefore, I have decided to cut the losses even if the selling price is lower than the purchase price. NVAX opened the week at \$1.76, went up to the highest at \$1.93 on Tuesday but went down ever since the peak to only \$1.56 by the end of the week. ODP had the exact same trend when it started at \$3.56 on Monday, went up to the week's high at \$3.64 on Tuesday but dropped down quickly to only \$3.34 at the end of Friday.

NMX also continued to go down since its drop last week, fluctuates at around 0.95 to 0.98 dollar per share. Fortunately, it seemed to rise up again towards the end of the week, with the high on Friday at \$1.04 and closes the market at \$0.98.

Unlike the good rise from last week, ATLS dropped down significantly. It opened the market at \$1.62 per share, rising slightly to the peak of the week that noon at \$1.66. Since then, it only went down to \$1.58 by the end of Friday, despite the slight hopeful rise mid-week to \$1.65.

CANN remains the most promising stock out of the whole portfolio. After cutting the loss from ODP and NVAX, I decided to expand my share of CANN, but not to put myself in an overly high position. Due to the nature of OTCQB stock, CANN had great volatility this week, showing a particularly high fluctuation on October 12<sup>th</sup> and 13<sup>th</sup>. The stock opened at \$2.6 on Monday, rising quickly to a whooping high of \$4.72 per share by Thursday. Within Thursday itself, CANN has a low of \$2.13 and a high of \$4.72, making it a really good stock especially for day trading.

Both OTCQB stock had a great performance this week. Though not as spectacular as CANN, FNMA also had a good rise. It opened at \$1.86 on Monday, raised to a good \$1.91 on



Tuesday and kept at the high 1.8 mark throughout the week till its drop late Friday to \$1.78 per share.

Considering all the given data, Table 6.4 below shows all my Week 3's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total profit
10/12/16	NVAX	Sell	\$1.63	2000	\$3,265	-\$1,355.00	\$30,229	\$4,742.92
10/12/16	NMX	Buy	\$0.93	1000	\$925		\$29,304	\$4,742.92
10/12/16	FNMA	Sell	\$1.87	2000	\$3,735	\$315.00	\$33,039	\$5,057.92
10/12/16	CANN	Sell	\$4	2500	\$9,995	\$4,220.00	\$43,034	\$9,277.92
10/14/16	FNMA	Buy	\$1.79	2000	\$3,585		\$39,449	\$9,277.92
10/14/16	CANN	Buy	\$3.35	4000	\$13,405		\$26,044	\$9,277.92

*Table 6.4 Table of trading actions by 10/14/2016*

This week, I made a total of 6 trades, 4 on Wednesday, October 12<sup>th</sup> and 2 on Friday, October 14<sup>th</sup>. I decided to cut the loss on NVAX and get more of NMX while the price is low. Also, I was able to sell two OTCQB stock, CANN and FNMA with a high price and buy it back again later on in the week with a much lower cost, especially with CANN. Looking at the great result of CANN, I decided to get more shares of this stock. After all the actions made this week, my total cash are down to \$26,129; while my stock asset rises up to \$38,083 making a total profit of \$1038 this week.

#### 6.4.5. Week 4 (10/17/2016 – 10/21/2016):

This week is an even greater week for CANN. The stock went up to the highest of \$5.19 on October 18<sup>th</sup>. Throughout the whole week the stock always kept at the mark over \$4.00 per share, which is almost double the initial purchase price. It opened at \$3.3 on Monday but quickly raised to \$4.23 the same day and continued fluctuated at around \$4.5 per share throughout almost

the whole week. The stock price for marijuana are going crazy this week due to the vote from nine states which may legalize weed and change the fate of the entire industry.

Unlike the exciting rise from last week, FNMA had a rather dull week with low volatility and even a slightly downward trend. FNMA. It opened at \$1.77 on the 17<sup>th</sup>, went up to \$1.8 on the 18<sup>th</sup> but then began to drop slowly to only \$1.74 by the end of Friday.

NVAX might change for the better as it had an upward trend for the first time ever since the initial purchase. It opened at \$1.5 per share on Monday, went up very slightly to a high of \$1.6 on both Tuesday and Wednesday but slowly drifted off again and closed at \$1.52 when the market closed on the 21<sup>st</sup>.

ODP continued its trend of going downward slowly and slightly. It opened at \$3.35 and raised up to the peak of the week on the same day at \$3.38. However, ODP again dropped down continuously from its peak to \$3.32 by the end of Friday. Seeing this concerning trend for ODP, I decided to accept the failure and sold half of my share at only \$3.28.

ATLS also had a terrible fall from its opening, which is also is highest, at \$1.58 per share to the lowest of \$1.28 on both Wednesday and Thursday. Despite of that, we see a slight rise on Friday when the stock goes back up to the highest at \$1.5 per share and closed at \$1.38. Another OTCQX stock, NMX, had almost literally no change at all when it was frequently at \$1.2-\$1.4 per share throughout the five-day period.

Considering all the given data, Table 6.5 below shows all my Week 4's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
10/20/16	Sell	ODP	\$3.28	1000	3275	-\$335.00	\$29,319	\$8,942.92
10/20/16	Sell	CANN	\$4.39	2500	10970	\$2,595.00	\$40,289	\$11,537.92

*Table 6.5 Table of trading actions by 10/21/2016*

This week I only made only two trades, due to the fact that there were no interesting fluctuations going on at all in my stock portfolio apart from CANN. Both selling order were made on Thursday, October 20<sup>th</sup> 2016, for ODP and CANN. After this, my total liquid cash are \$37,034, my stock assets are \$28, 324. This brings a total profit of \$4,495, mostly from the sudden high price of CANN.

#### 6.4.6. Week 5 (10/24/2016 – 10/28/2016):

The overall performance of all the stocks did not seem great this week as all of them were dropping with the exception of CANN and ATLS. CANN had a great opening on Monday at \$4.09 per share, going up to \$4.60, which is the high of the whole week, on Monday's noon. The stock dropped slowly during the week till its lowest at \$3.07 on Thursday but it soon picks up again by the time the market closes on Friday with \$4.0 per share. CANN continues to be the stock that brings the most profit from 6 stocks in my portfolio.

FNMA has a rather unexciting week, during which it had very low volatility with a rather downward trend. It opened at \$1.75 and fluctuates at the mark \$1.71-\$1.73 the whole week until it dropped slightly on Thursday and Friday with a low of \$1.66.

Contrary to my expectation, both stocks from NASDAQ continued to drop. The most disappointing one is NVAX. It has been dropping continuously since the slight rise last week. Throughout the whole week, it had a high at \$1.67 on Wednesday but quickly went down to only

\$1.44 per share. If NVAX does not go up within the next month, the right strategy is to accept the loss and sell them at any price under \$2. Similar to NVAX, ODP's price were going down non-stop since its highest, which is also its opening on Monday at \$3.31. The stock ended an upsetting week as low as \$3.15 per share on Friday.

Two OTCQX stock did not drop down terribly but they also did not show a whole lot of interesting fluctuation this week, especially NMX. The stock opened at \$1 on Monday, with its highest at \$1.02 on Wednesday, lowest at \$0.95 on Tuesday and closed the week at \$0.99. NMX had a very low volatility for the week of Oct 24th. Hence, I could make any move with it.

Fortunately, ATLS went up constantly this week, from \$1.4 on Monday to a high of \$1.6 on Friday, closing the whole week at \$1.59 per share. However, due to the significant drop last Thursday (10/20/2016), the stock still did not rise up to the selling price expectation yet.

Considering all the given data, Table 6.6 below shows my Week 5's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
10/24/16	Sell	CANN	\$4.36	1500	\$6,535	\$1,510.00	\$46,824	\$13,047.92
10/28/16	Buy	CANN	\$3.27	5000	\$16,355		\$30,469	\$13,047.92
10/28/16	Buy	FNMA	\$1.68	2000	\$3,365		\$27,104	\$13,047.92

*Table 6.6 Table of trading actions by 10/21/2016*

This week, I made only 3 trades, 1 on Monday 10/24/2016 and 2 on Friday 10/28/2016, both at around 11am. After these moves, my total liquid cash are down to \$27, 104 dollars and my total stock assets are up to \$39, 263 dollars. This makes my total net profit this week \$1, 510.

#### 6.4.7. Week 6 (10/31/2016 – 11/04/2016):

The stock that has the most interesting volatility this week is ODP. ODP is one of the stock that has been dropping almost constantly since my initial purchase. However, on Wednesday (11/02/2016), ODP suddenly jumped from \$3.06 to \$3.51 per share and has been increasing still. The highest for ODP this week is \$3.65, the first time ever higher than the initial purchase price. This sudden increase is due to the company Q3 better-than-expected earnings estimate published on November 2<sup>nd</sup>. As a result, the company's shares gained more than 15%. I can sell the stock at a slightly higher price than the initial purchase and get rid of ODP in my portfolio but due to this good news, I decided to hold back the stock and hope it will continue to rise in near future.

The other NASDAQ stock, NVAX also has high volatility. The stock opened at \$1.45 on Monday, going to its high at \$1.57 that afternoon but quickly dropped down to only \$1.22 on Thursday. However, it rose back again to \$1.52 and closed the week at \$1.45. I will also keep NVAX because the company will publish their Q3 financial result next week, on November 9<sup>th</sup>, 2016.

Two OTCQB stock, however, did not have a very surprising fluctuation this week. CANN continued its favorable trend to buy and sell. It opened at \$4.26, rose to its peak of the whole week at \$4.5 on Tuesday and dropped to only \$3.33 by the time the market closes on Friday, making it a good time to buy in more. FNMA did not a very high volatility this week. It opened and closed the week at \$1.69 per share, with its low at only \$1.63 and high at \$1.73.

Both OTCQX stock has the same downwards trend this week. ATLS dropped hard from \$1.59 as it opened on Monday to only \$1.29 by the end of Friday. The high of the week is at \$1.62 on Monday while the low is approximately the close price on Friday at \$1.28. NMX also

dropped down, though not as hard as ATLS. It opened at \$1.04, rising to the day, which is also the week highest, at \$1.08. Since then it has been dropping to its low, which is also its closing price on Friday, at \$0.95.

Considering all the given data, Table 6.7 below shows all my Week 6's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
10/31/16	CANN	Sell	\$4.18	3000	\$12,535	\$2,725.00	\$39,639	\$15,772.92
11/4/16	CANN	Buy	\$3.25	4000	\$13,005		\$26,634	\$15,772.92
11/4/16	ATLS	Buy	\$1.29	2000	\$2,585		\$24,049	\$15,772.92

*Table 6.7 Table of trading actions by 11/04/2016*

This week, I made only 3 trades, 1 on Monday 10/31/2016 and 2 on Friday 11/04/2016, both at around 12pm. After these moves, my total liquid cash are down to \$24, 049 dollars and my total stock assets are up to \$ 45, 632 dollars. This makes my total net profit this week 2, 725\$.

#### 6.4.8. Week 7 (11/07/2016 – 11/11/2016):

This has been an eventful week for the stock market in general, due to the election of the new president, house and senate for the United States. Regardless of the final result, the over the counter stock market did not seem to be affected much apart from FNMA – a government base mortgage loan company. Mortgage rates have risen slightly in the days since the election, which lead to the increase of FNMA (+6.94%). However, it is said that this might be just market volatility and will normalize itself in the days ahead. FNMA opened at \$1.69 on Monday and rose to over \$2 per share right after the election. Its high this week is on Friday, where the stock went up to a whopping \$3.25 per share.

Apart from the election, the most interesting event which affected a certain stock in my portfolio (CANN) this week must be the legalization of recreational marijuana in California, Massachusetts, Nevada and Main. The company also published their Q3 Analysis on November 8<sup>th</sup>, which shows overall good, but not exceptional result. Similar to the past two weeks' trend, CANN opened at \$3.4, went up on Monday and even higher on Tuesday, with a high up to \$5.19 and then decreased from then till the end of the week. The price per share on Friday by the time the market closed was \$3.48.

NVAX opened at \$1.5 on Monday and it seemed to increase slightly to \$1.7 until the company published their Q3 Analysis (11/09/16). However, the result was not pretty, leading to the company's 30% staff lay-off. The stock has decreased even further since, to only \$1.39 at the end of Friday. Despite of that, I am still keeping some NVAX stock as the company is developing a hopeful project on vaccine for Zika virus.

ODP continued an upward trend since the publication of the company's Q3 financial report last week. It opened at \$3.58 on Monday and has been going up ever since. The whole week's high was on Thursday, where it raised up to \$4.22 per share. There is a small decline on Friday but it still closed the week at \$4.15.

The two stock with the least volatility this week is NMX and ATLS, in spite of the fact that both had a slight rise. ATLS opened at \$1.35, went to a high at \$1.57 on Wednesday then closed on Friday at \$1.51. NMX still fluctuates at the \$1 mark throughout the whole week.

Considering all the given data, Table 6.8 below shows all my Week 7's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
11/7/16	CANN	Sell	\$4.24	3000	\$12,715	\$2,965.00	\$36,764	\$18,737.92
11/8/16	CANN	Sell	\$4.74	3000	\$14,215	\$4,425.00	\$50,979	\$23,162.92
11/8/16	NMX	Sell	\$0.99	3360	\$3,321	\$196.60	\$54,300.37	\$23,359.52
11/11/16	CANN	Buy	\$3.37	4000	\$13,485		\$40,815.37	\$23,359.52
11/11/16	FNMA	Sell	\$2.81	3000	\$8,425	\$3,275.00	\$49,240.37	\$26,634.52

*Table 6.8 Table of trading actions by 11/11/2016*

This week, I made a total of 5 trades, all around 11am-12pm. After these moves, my total liquid cash is up to \$ \$49,240.60 dollars and my total stock assets are down to 32, 394.85 dollars. This makes my total net profit this week \$10,861.60.

#### 6.4.9. Week 8 (11/14/2016 – 11/16/2016):

This week, there were not a lot of unexpected fluctuations among my stock portfolio. CANN continued to be profitable despite the fact that it did not stay as volatile as last week. It opened at \$3.65 on Monday, rose up and went to its highest on Tuesday (the peak is at \$4.40). From then, the stock slowly dropped down till its low on Thursday and Friday. This exact trend has been happening for the past 4 weeks in a row, helping me make a good profit from just this stock.

Another stock with good and predictable trend is ODP. Ever since its Q3 Analysis update, the stock went straight up every day. This trend has continued from November 1<sup>st</sup> to current, and hopefully it will remain up in the near future. ODP opened at \$4.21, went to its all-week-high at \$4.76 on Friday and closed off at \$4.68.

After the US Election from last week, FNMA continued to go up, now almost doubled what it was right before the election. It opened at \$2.81 on Monday, went through the week with continuous positive trend and closed the week at \$3.13. FNMA's Friday high, which is also the



week's high, went up to \$3.28, as opposed to the stock price before the election (\$1.64 per share).

NMX did not fluctuate a lot this week, although it did go up very slightly. It opened at \$0.96 and closed at \$0.99, which is also the week high. NMX did not show high volatility since the beginning of the simulation, but it kept a steady trend and still remains good to make small profits.

The two stock that performed badly this week is NVAX and ATLS. ATLS did not fluctuate a lot and has a slightly downward trend. The stock opened at \$1.51 and went to its peak which is also its Monday's peak at \$1.54 and dropped down since. It closed at \$1.32 by the end of November 18<sup>th</sup>. This might be due the company's Q3 earning release on November 14<sup>th</sup>. We are hoping that this decrease is just temporary as ATLS has risen 150.83% since April 12, 2016 and is predicted to be an up trending stock.

NVAX continued to decrease as expected. It opened at \$1.43 and went up slightly that morning to the week's high at \$1.45 and then dropped down constantly until its closing at \$1.29 on Friday. At this moment, I am only waiting for a slight rise to cut off this stock or setting this stock aside as a long-term investment instead because NVAX does not have a high chance of rising up any time in the near future.

Considering all the given data, Table 6.9 below shows all my Week 8's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Date
11/14/16	ATLS	Sell	\$1.51	2000	\$3,015.00	\$430.00	\$52,255.37	11/14/16
11/15/16	CANN	Sell	\$4.17	4000	\$16,675.00	\$3,190.00	\$68,930.37	11/15/16
11/15/16	ODP	Buy	\$4.27	4000	\$17,085.00		\$51,845.37	11/15/16
11/18/16	CANN	Buy	\$3.80	5000	\$19,005.00		\$32,840.37	11/18/16
11/18/16	FNMA	Sell	\$3.12	1000	\$3,120.00	\$1,410.00	\$35,960.37	11/18/16
11/18/16	ODP	Sell	\$4.67	2000	\$9,335.00	\$795.00	\$45,295.37	11/18/16

*Table 6.9 Table of trading actions by 11/18/2016*

This week, I made a total of 6 trades, again, all at around 11am-12pm. After these moves, my total liquid cash are down to \$ 45, 296.37 dollars and my total stock assets are up to \$42, 532. This makes my total net profit this week \$5,825.00

6.4.10. Week 9 (11/21/2016 – 11/25/2016):

This week, all the three stock exchanges, OTCQB, OTCQX and NASDAQ, only opened for four days and closed on Thanksgiving. The stocks from company with bigger market cap continued to rise to a high price but the stocks from smaller companies (which is the majority of all penny stocks) does not seem to be affected a lot by the overall rising trend of the whole market but more on the individual performance of the company.

For the first time in a while, CANN began its downward trend due to the finished vote to legalize marijuana in the US. After a period of continuous rising and high volatility, CANN seemed to adjust back its price. It opened at \$3.67 and went to its weekly high the same day at \$3.75 and has been dropping down since, closing the week at only \$3.10, with its low at only \$2.34, almost half of which it was at its high two weeks ago.

NVAX opened at \$1.31 dollars and continued to go down just as predicted and so far, this has been the stock with the worst performance in my portfolio. As the simulation coming to the

end, I decided to sell all of the shares I have at only half of the price bought in. After my activity, NVAX went up to \$1.32, which is the week's highest, but quickly decrease to its low at only \$1.17 on Friday and closed off the week at \$1.24.

Both ATLS and NMX had a rather dull week when the two stocks did not have very interesting fluctuation, low trading volumes and is going slightly down on their price. NMX opened the week at \$0.99 and went up to its week high on the same day at \$1. It decreased slightly throughout the 4 days, closing on Friday at \$0.97. Very similar to NMX, ATLS opened at \$1.36 and also went to its week high on Monday at \$1.45 then decreased more rapidly until it closed the week at \$1.13.

Unlike the fast rise from last week, FNMA went down slightly for the week of November 21<sup>st</sup>. It opened at \$3.16 on Monday and went up to its high of the week at \$3.21 on the same day. Afterwards, the stock decreased slightly throughout rest of the week but seemed to rise up again on Friday. FNMA closed the market this week at \$3.11, but is predicted that it, along with Freddie Mac, will continued to be potential stock with interesting fluctuation in the future.

This week, ODP published its dividend on Tuesday, November 22<sup>nd</sup>, at \$0.025. Apart from this, the stock continued to rise and is predicted to continue to do so in the future. It opened at \$4.7 and went up continuously every day until its high on Friday at \$4.95 per share and closed off at \$4.87.

Considering all the given data, Table 6.10 below shows all my Week 9's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
11/21/16	CANN	Sell	\$3.69	3000	\$11,065.00	-\$335.00	\$56,360.37	\$32,124.52
11/21/16	NMX	Sell	\$0.99	3000	\$2,965.00	-\$305.00	\$59,325.37	\$31,819.52
11/21/16	NVAX	Sell	\$1.32	2330	\$3,070.60	-\$2,311.70	\$62,395.97	\$29,507.82
11/22/16	FNMA	Buy	\$3.12	5000	\$15,600.00		\$46,795.97	
11/23/16	CANN	Buy	\$2.64	3000	\$7,925.00		\$38,870.97	

*Table 6.10 Table of trading actions by 11/25/2016*

This week, I made a total of 5 trades, again. After these moves, my total liquid cash are down to \$ 38, 870.97 dollars and my total stock assets are up to. Also, ODP release their quarterly dividend for shareholders, at the rate of \$0.025 per share, creating an extra income of \$75 dollars. This brings my total stock assets up to this point to \$45, 632.45 and my total net profit this week is -\$2,957.70.

#### 6.4.11. Week 10 (11/28/2016 – 12/02/2016):

This week is the last week of our simulation, and I only kept 4 stocks left in my portfolio: CANN, FNMA, ODP and ATLS. Overall, apart from ATLS, all the other stocks had an upward trend in the week of November 28<sup>th</sup>, especially FNMA.

FNMA opened on Monday at \$3.10 per share and rise up continuously and quickly to its highest of the week at \$5 per share, double what it was 2 weeks ago. Only in two days (11/30 and 12/01), FNMA went up more than 30% due to the commentary from Steven Mnuchin, President-elect Donald Trump's Treasury Secretary nominee, claiming that the new administration will no longer make Freddie Mac and Fannie Mae government owned company. The stock did go down slightly on Friday, but still kept at a high price of \$3. 76 per share when the market closed on Friday.

ODP continued to stay at a high price of nearly \$5 a share, although there is not much crazy fluctuation happening this week. It opened at \$4.9 on Monday and went up to its highest of the week on all November 30<sup>th</sup>, December 1<sup>st</sup> and 2<sup>nd</sup> at \$4.94 per share. ODP closed the market at \$4.84 this week, a very slight decrease from the week before, but still remain a very potential stock to watch out for in near future.

CANN rose back up again from its strong decrease last week on Monday and Tuesday. It opened at \$3.46 and went up to its weekly high on both Monday and Tuesday at \$3.47. From that the stock went down continuously to its lowest on Friday at only \$3 and closed off the week at \$3.03.

ATLS continued to decrease with similar trend to its last week's performance. It opened at \$1.12 and went to its all week highest on the same day at only \$1.17. The stock quickly plunged constantly to the lowest at only \$0.7 per share on Thursday but rose up slightly to \$0.87 at the end of Friday.

Considering all the given data, Table 6.11 below shows all my Week 10's transaction (with commission cost at \$5 per transaction included in the net cost):

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total profit
28/11/16	CANN	Sell	\$3.45	5000	\$17,245.00	\$1,725.00	\$56,115.97	\$31,232.82
28/11/16	ATLS	Sell	\$1.11	1265	\$1,404.15	-\$430.10	\$57,520.12	\$30,802.72
12/1/16	FNMA	Sell	\$4.83	5000	\$24,145.00	\$8,545.00	\$81,665.12	\$39,347.72
12/1/16	ODP	Sell	\$4.89	3000	\$14,665.00	\$2,515.00	\$96,330.12	\$41,862.72

*Table 6.11 Table of trading actions by 12/02/2016*

This week, I made a total of 4 trades on Monday and Thursday, all at around 10am-12pm. After these moves, my total liquid cash, which is also my total asset, up to \$96,330.12 dollars. This makes my total net profit this week \$12,360.90.

## ***6.5. Simulation analysis and conclusion***

### ***6.5.1. Overall performance:***

Table 6.12 shows the summary of the simulation's weekly performance from the beginning of Week1 (09/26/2016) to the end of Week 10 (12/01/2016):

Week	Total Assets	Total Cash	Total Stock Asset	Net profit
1	\$57,145.00	\$17,646	\$39,499.00	\$2,145.00
2	\$61,097.00	\$26,964	\$34,133.00	\$3,952.00
3	\$64,277.00	\$26,044	\$38,233.00	\$3,180.00
4	\$66,537.00	\$40,289	\$26,248.00	\$2,260.00
5	\$68,047.00	\$27,104	\$40,943.00	\$1,510.00
6	\$70,772.00	\$24,049	\$46,723.00	\$2,725.00
7	\$81,634.00	\$49,240	\$32,394.00	\$10,862.00
8	\$87,459.00	\$45,295	\$42,164.00	\$5,825.00
9	\$84,502.00	\$38,870	\$45,632.00	-\$2,957.00
10	\$96,862.00	\$96,330	\$0.00	\$12,360.00

*Table 6.12 Table of weekly performance over 10 weeks*

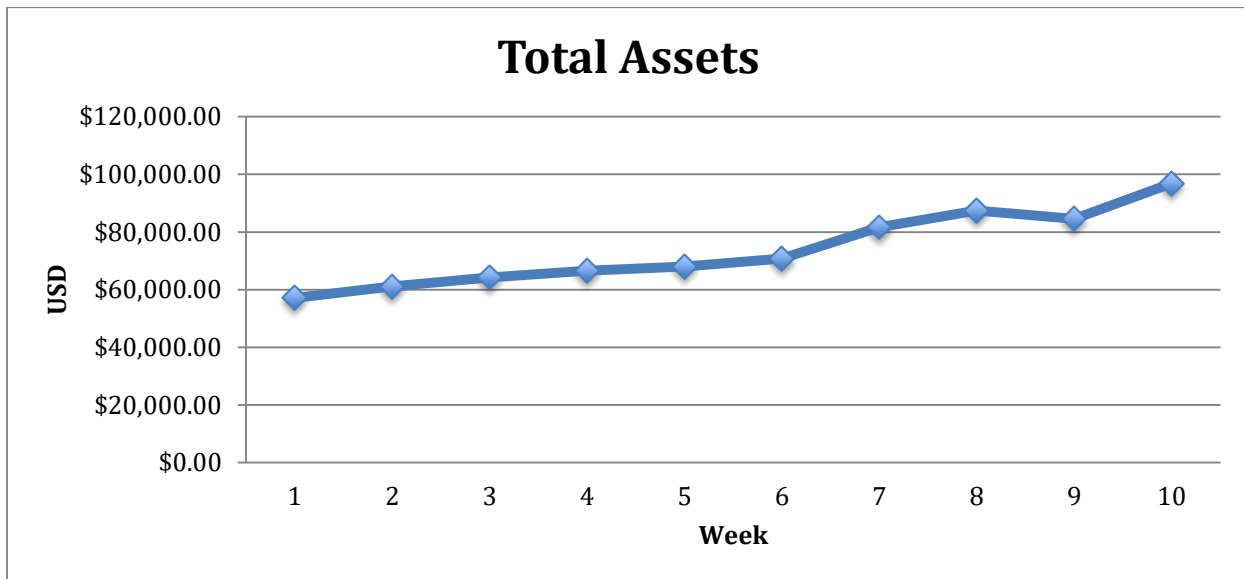
The summary of the actions performed in the past 10 weeks are listed in Table 6.13 below:

Initial Cash Amount	\$55,000
Final Cash Amount	\$96.330 (175.46%)
Profit	\$41.862 (75.46%)
Buying transaction	20 (40%)
Positive selling transaction	23 (46%)
Lost selling transaction	7 (14%)
Total number of trades	50
Total commission fee	\$250

*Table 6.13 Table of total trading actions over 10 weeks*

### 6.5.2. Performance analysis over the 10-week period

During the course of this simulation, Figure 6.7 below shows my total assets fluctuation over 10 weeks:



*Figure 6.7 Asset growth over the 10-week simulation*

Looking at the graph above, there are several notable events that significantly affect the prices of stocks in my portfolio. The first event is when Seven states and the District of Columbia have adopted more expansive laws legalizing marijuana for recreational use. Most recently, California, Massachusetts and Nevada all passed measures in November 8<sup>th</sup> legalizing

recreational marijuana. This makes cannabis stock went crazy for a period of time with sudden increase in both volatility and liquidity. At the beginning of October, CANN closed price is \$2.46 dollars and increased constantly over the course of the month, up until its highest on the voting date which legalize marijuana, bringing the price per share up to its peak of \$5.19. This is an increase of 110% over a period of 5 weeks. Throughout the last week of October and first week of November, CANN usually fluctuates at around \$4 per share, becoming one of the main profit sources in my stock portfolio. This company is the clearest example of how picking the right penny stock at the right time can generate a large amount of profit over such a quick period of time.

Another example of national events that heavily effect the price of a penny stock is the United State presidential election result. The stock of The Federal National Mortgage Association (FNMA), a government-sponsored enterprise, rose up fast and unexpectedly after Mr. Trump became the president-elect. On November 9th, the day of the presidential vote, FNMA's closing price is \$1.97 and it reached its peak 3 weeks later at \$5 per share on December 1st (an increase of 154%). Up until this point, the current closing price of FNMA on December 9th is still very high at \$4.14 per share, which is still more than double the its price at exactly one month ago.

Apart from global and political news that affect the price of stock, company financial report publication can also drastically affect the stock price. ODP stock has been dropping constantly throughout the whole month of October, from \$3.58 on October 3<sup>rd</sup> to only \$3.05 on November 1<sup>st</sup>. However, after the companies' Q3 earnings release that surpassed analysts' estimates on November, ODP stock began to rise, and it went up quick. The stocked jumped from \$3.05 to \$3.51 overnight on November 2<sup>nd</sup> and then continued to move upward. Currently,



on December 9<sup>th</sup>, a little bit over a month since its Q3 earning release, ODP's closing price is \$5.11 (an almost 68% increase over 5 weeks), making it no longer a true penny stock anymore.

However, sometimes, news and analysis might not be completely accurate for penny stock and the company's earning publication might be a hard hit on the stock price in the case of NVAX. NVAX has always been a notable stock in the market and many analysts said that it is the stock to watch out for. However, the company's Q3 earning release showed worse financial status than people expected causing the stock to sink even further. I was not brave enough to cut the loss early in this case and listened to stock analysis saying that NVAX's stock is a "Hold", thus creating a huge loss in my investment.

### *6.5.3. Strategy Pros and Cons*

After the my 10-week simulation, here are my list of pros and cons for the Penny Stock Trading method:

#### *Pros:*

- You do not need to spend a lot of time actually actively trading like method such as day trading and you can leave some of your stock sit for a certain period of time. However, you spend more time doing research reading up on company news and press releases.
- High volatility: most of the penny stocks in Over The Counter market place has high fluctuation over time and choosing the correct stock to invest in can bring big amount of profit over a short period of time (For example: CANN in my situation). However, this volatility rate does not always apply to low-price stock in bigger market such as NASDAQ.

- Penny Stock trading does not require a huge amount of investment money to begin with. You can still gain a considerable amount of profit with smaller initial investment compared to expensive stocks from bigger market.
- Does not require a lot of investing experience. Due to the fact that Penny Stock trading is so risky and it is hard to hold a bigger position in these companies with small capitalization, institutional investors who work for big Wall Street companies with large portfolio tend to not care about this trading method. Therefore, there are more room for amateur and independent proprietary traders.

Cons:

- Low liquidity: because of the small company size and the low amount of trading volumes per day, it is harder to take quick action on penny stock compared to stocks from large companies in big exchanges. Due to the low stocks volumes, you might put yourself in a big position in the company where you actually influence the stock price. This situation is much less likely to happen with stocks from big cap companies.
- Little available information: penny stocks, especially Pink-sheet stocks, usually come from little company with not many available information online. Some of them are sketchy and you might be easily scammed when buying stocks from companies with no financial standard
- Some penny stock is heavily dependent on unexpected events happening in the company itself or national and global events. This can be both a good and bad thing but regardless of which, you need to closely keep track of what is going on, especially companies' press release and report publication.

In conclusion, penny stock is a type of stock with good risk/reward ratio and is suitable for amateur or independent proprietary traders who are willing to take risks and want to make good profit over a short period of time. The most important thing in trading penny stock is doing research to pick the right company and not let emotions get in the way of trading. Traders should be willing to accept loss (it is unavoidable in penny stock trading) and not getting greedy when having successful trades.

## 7. Conclusion

### 7.1. *Strategies comparison*

Before doing any further comparison for this chapter, let's first go through a summary of each trading strategies first.

The hybrid long-term dividend stock investment provides a safe, secure and simple way to invest a big asset over a long period of time, without having to constantly put in maintenance effort. On the other hand, since this is a long-term strategy, the payout rate is very slow, but constant: dividend stocks will eventually pay for itself and bull companies will gradually grow, if the time period of investment is long enough. Therefore, this strategy would provide an alternative to safely deposit your asset to a big and reliable bank, with a slight higher interest rate.

Day trading strategy is one of the many popular stock trading strategies out there. On contrary to the long-term strategy, day trading requires a lot of maintenance from the investor: watching the stock price frequently every day and making a lot of trade per week. The profit made from the day trading strategy mostly comes from the stock's price volatility, and when to make the right call. Therefore, this strategy would be suitable for a more experience investor, with a lot of time to spend on the stock market.

Swing trading is again similar to the day trading strategy, making profit from the market's volatility. Again, as a short term trading, the investor is required to spend a lot of time watching and forecasting the stock's price, thus making the right decision whether to sell or buy.

Therefore, once again, this strategy will be suitable for investors with experience within the stock market and having time to watch the stock market.

At last is the risky and unorthodox trading strategy, the penny stock trading, as can be seen in “The wolf of Wall Street” movie. This trading method requires the investor to trade at smaller, less reliable OTC marketplaces. These marketplaces do not assure the companies’ reliability, such that a company can disappear next day along with the investors’ money. Moreover, it is very hard for someone to trade penny stock instantly, meaning sometimes it is very hard to be able to sell the stocks. However, with careful consideration, experience and economy knowledge, one can make a fortune out of a small asset, as this strategy has the highest payout rate out of the four. Therefore, this strategy can be considered as high risk, high reward, thus requires a small starting asset, but also required a certain amount of knowledge and research efforts from the investor.

The final return assets from the four strategies are as follow:

- Hybrid long-term dividend: 9.64%
- Day trading: 9.78%
- Swing trading: 5.79%
- Penny stock trading: 75.5%

Out of the four, it is no surprise that penny stock trading has the highest profit percentage, a whopping 75.46%, which is more than seven times the profit from other strategy. On the other hand, day trading strategy has the unexpected lowest profit percentage. However, considered the

people conducting this simulation are only a group of college students, the profit percentage is explainable.

Overall, the strategies comparison can be summarized in Table 7.1 below.

<b>Strategy</b>	<b>Profit</b>	<b>Pros</b>	<b>Cons</b>	<b>Suitable for</b>
<b>Long-term dividend</b>	9.64%	- Low maintenance - Constant growth rate - Does not require experience	- Requires a long period of time - Low payout rate - Requires large initial asset.	New comer
<b>Day trading</b>	9.78%	- Fast payout - High payout rate	- Many commissions	Stock investor
<b>Swing trading</b>	5.79%	- Don't have to be full time job - Lower risk than day trading and penny stock	- Many commissions - Lower percentage of benefit gain	Stock investor New and intermediate investor
<b>Penny stock trading</b>	75.5%	- Very high payout rate - Does not require big initial asset	- Risky - Low liquidity - Requires some understanding of the market	Experienced stock investor

*Table 7.1 Strategies comparison*

## **7.2. Simulations conclusion**

We ran our IQP project over 3 terms and conduct a 10-week simulation among four different methods and 16 companies. After researching the history of stock market and multiple different types of stocks along with trading techniques, we came up with a good companies' profile and began our trading. After the simulation, each method is concluded and analyzed its pros and cons in order to clearly summarize what we have learned throughout the trading process. This project is expected to give us knowledge on stock market trading, how events can affect the fluctuation of stocks and tips on what to do the maximize the profit in different

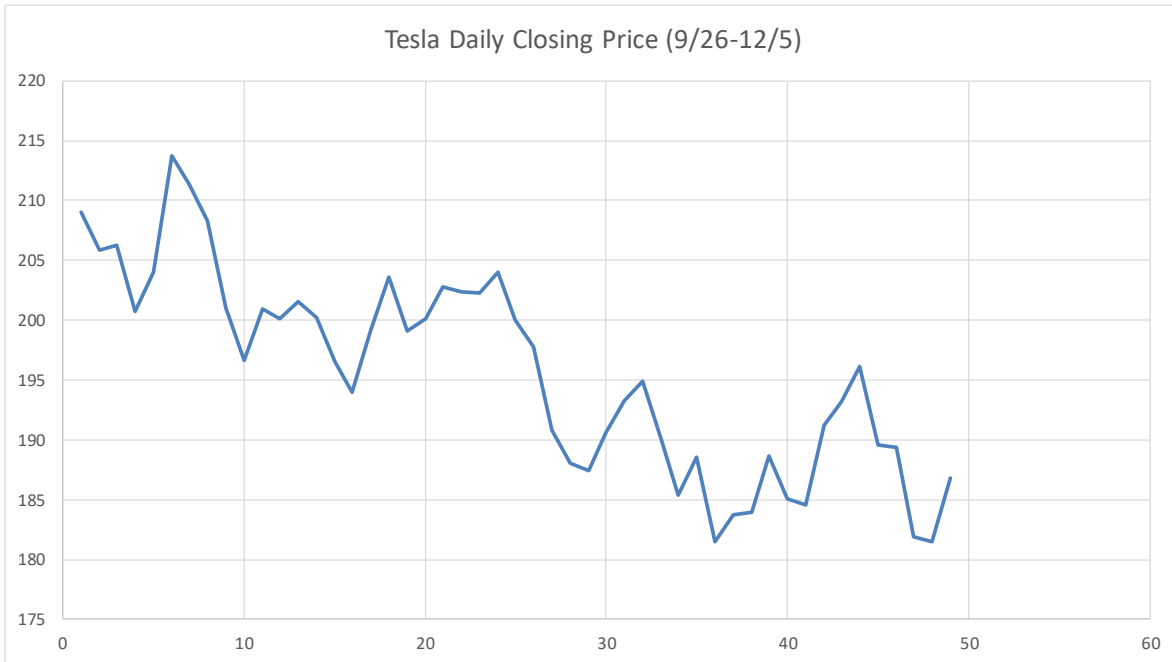
situations. From what we have gained so far from this project, we will be able to be more experienced traders who can make smart, informed decisions when we actually enter the real stock market in the future.

Overall, the results of all four methods are successful as they all returned good profit and all the initial goals which we set for ourselves were met. We were going to make a decision on which trading method is the most successful based on the comparison of the return profit. However, after consideration, we believe that it is difficult to tell what method is superior just based on the portfolio's growth because each is very different in terms of the risk/rewards ratio and is influenced differently within our trading time frame due to external events.

In conclusion, this project experience is helpful and rewarding to all the members in our group. We felt very fortunate to be able to work on the simulation during such significant events such as the US president election and observe the great impact of political phenomena on the movement of the stock market. After the simulations, we felt like we are all inspired to do stock market again in the future and apply what we have learned from this project towards real life.

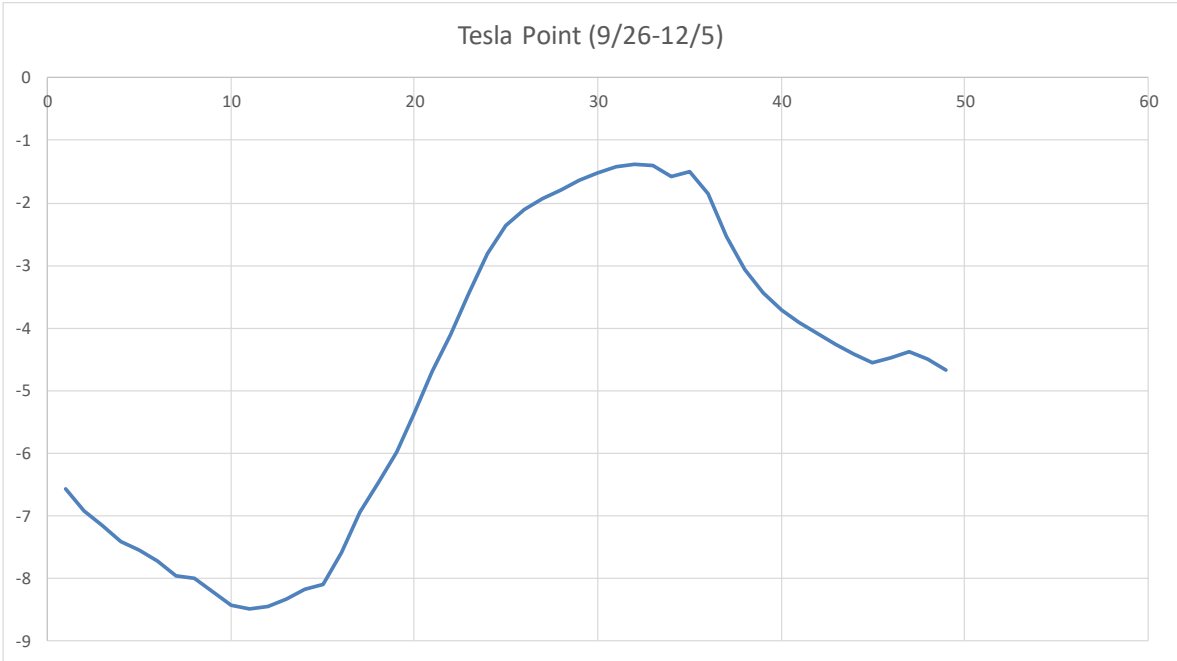
# Appendix

## *A. Daily closing price and moving average for long-term hybrid strategy*

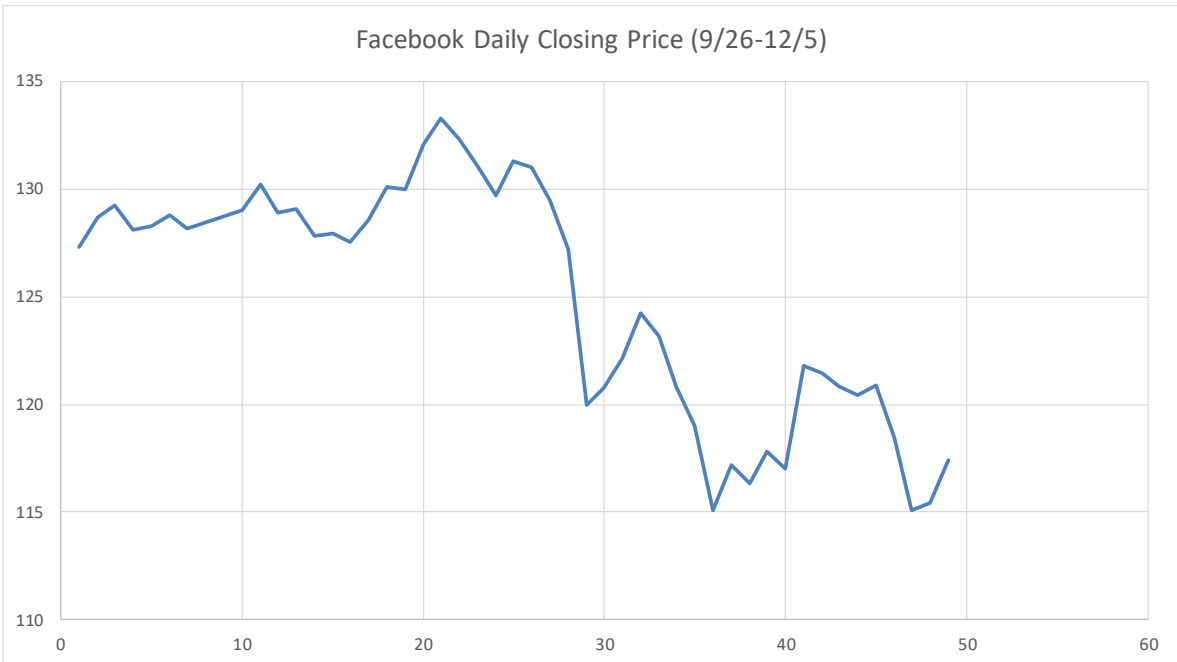


*Figure A.1 Tesla Daily Closing Price over the 10-week simulation*

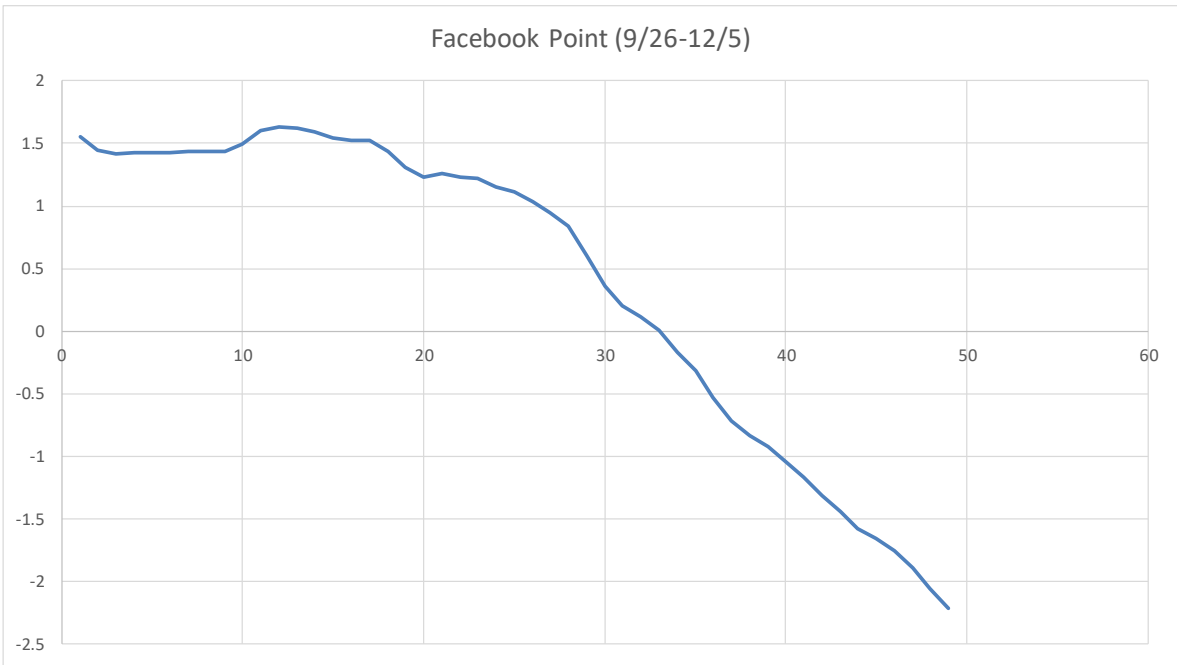




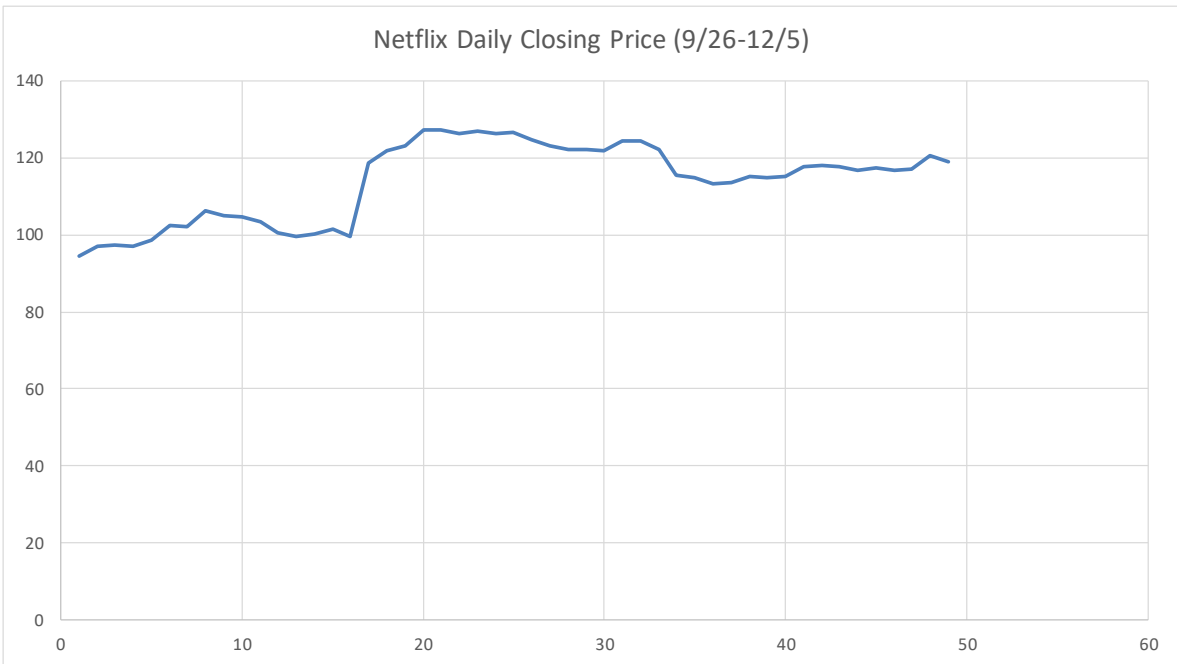
*Figure A.2 Tesla Moving Average Point over the 10-week simulation*



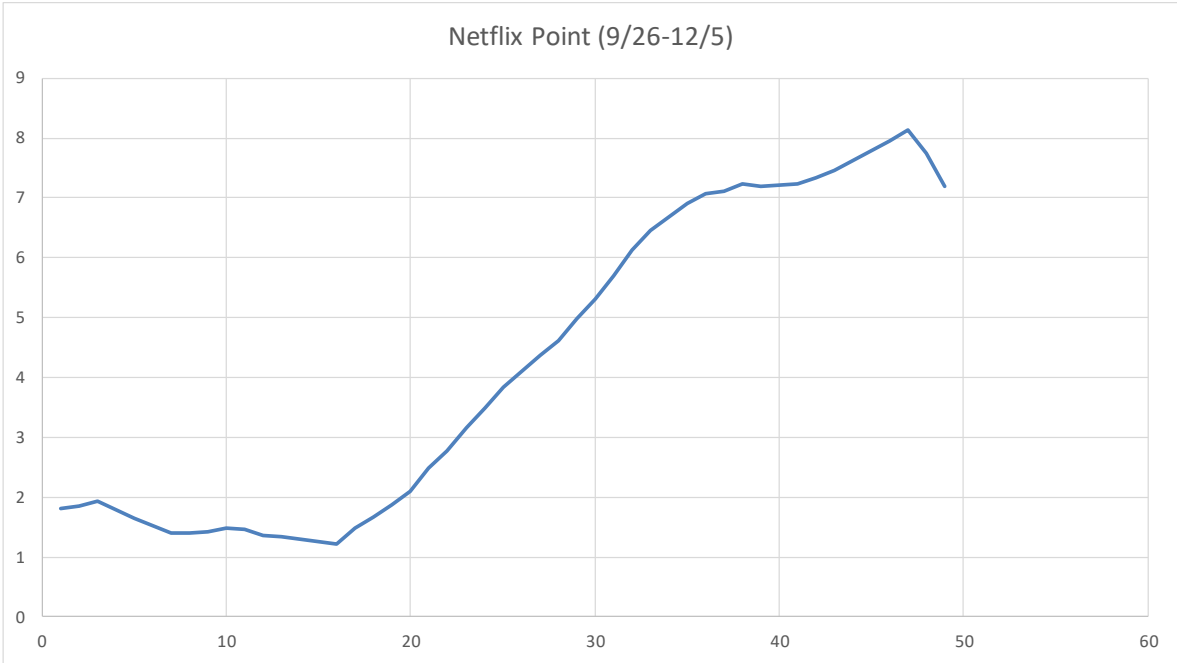
*Figure A.3 Facebook Daily Closing Price over the 10-week simulation*



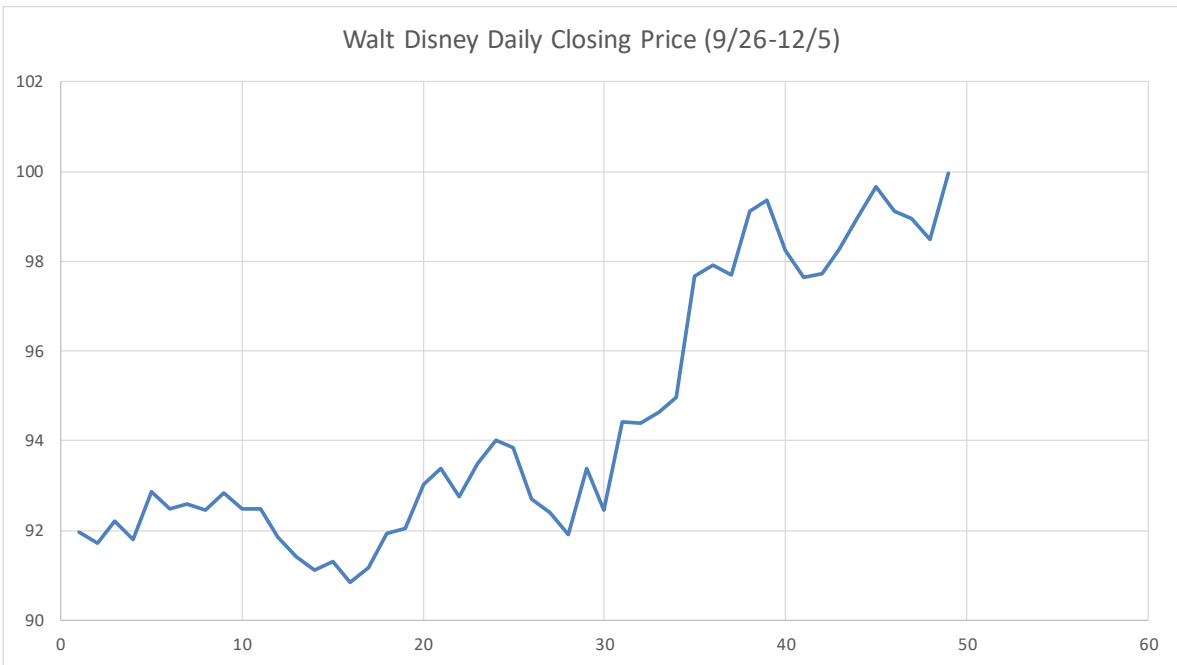
*Figure A.4 Facebook Moving Average Point over the 10-week simulation*



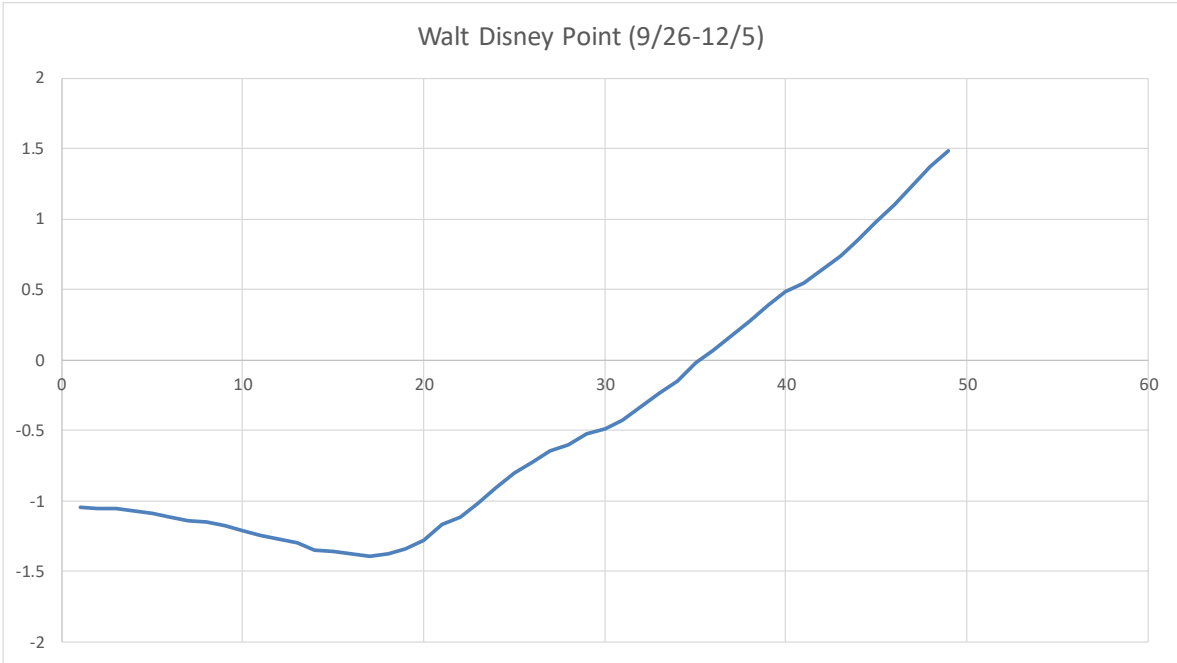
*Figure A.5 Netflix Daily Closing Price over the 10-week simulation*



*Figure A.6 Netflix Moving Average Point over the 10-week simulation*



*Figure A.7 Walt Disney Daily Closing Price over the 10-week simulation*



*Figure A.8 Walt Disney Moving Average Point over the 10-week simulation*

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