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Shaolin Xie \_\_\_\_\_

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Approved by:

\_\_\_\_\_  
Professor Dalin Tang, Project Advisor

## Abstract

A seven-week stock simulation was conducted in this project. The goal of the project was to gain knowledge and experience in stock trading through a series of research on basic background of the stock market and common investing strategies, and also through a real-time stock market simulation. The simulation made comparisons between two trading methods, swing trading and buy and hold trading, where transaction decisions were made to maximize profit for both strategies. The key of swing trading is to profit from “swings” in the price and buy and hold is to hold the stocks for a long term appreciation disregarding short-term changes. Ten companies were traded in each simulation with an initial balance of \$100,000. The result of this simulation showed that swing trading strategy was more profitable than the “buy and hold” strategy under the environment of this specific research period. The project provided valuable stock market trading experiences.

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## ***1. Introduction***

The goal of this project is to gain a knowledge of how the stock market works and to learn about basic investing techniques through a stock market simulation. After a series of comparisons of investment outcomes between two trading techniques, I am hoping to learn about the advantages and disadvantages of both investing methods applied in this study as well as having a good understanding of how stock market reacts to real-time changes in financial world.

### ***1.1 Formation of the Stock Market***

In the early days of investment trading in the 1600s, sea transportation of goods from the east back to Britain, France, and Netherlands always involved in risks of pirates and severe storms. In order to mitigate the risks, ship owners sought for investors to offer financial collateral prior to the voyage. The investors would receive a portion of monetary returns from the ship owner if the ship returns successfully with goods.

When the East India Company was formed in 1600, it provided a new investment model where the LLC relationship between ship owners and investors no longer hold for the duration for as short as one voyage. Instead, the importing companies offered stocks, which represented a fraction of ownership interest in the company, and allowed investors to invest in all voyages of a company. In this way, the companies are able to ask for more investment and thus increase scale of their business [10].

Nowadays, most stocks are traded on exchanges such as the New York Stock Exchange(NYSE), the NASDAQ, and the American Stock Exchange (AMEX), among which the NASDAQ is controversial in a way that it is based entirely on network and all trades are performed electronically instead of having a physical location like other stock exchanges [8].

In order for a company to become publically traded, the company will go to an investment bank with initial public offering (IPO). The investment bank will then conduct a research on this company's overall value and consider whether the percentage of share the company offers is reasonable, while guaranteeing a determined minimal price per share for the company.

## ***1.2 How to Read the Stocks***

Two basic terms in stock market trading are "bull" and "bear" markets. Bull market is when prices of stocks are generally rising, and bear market is when prices are declining and fall 20% or more from recent high. In a bull markets, investors want to take advantage of the rising prices where buy and hold strategy is encouraged to use.

Market capitalization (market cap) represents the total value of outstanding shares in the market. The higher the market cap, the more well-established a company is. The company's earnings per share (EPS) is the company's profits divided among its outstanding shares.

The performances of the stock market are usually reflected by sock market indices. One of the three most referenced index is the Dow Jones Industrial Average (DJIA). The DJIA indicates the value of 30 most impactful companies to American economy.

Another important indicator of stock market is Standard & Poor 500 (S&P 500), which is a market-capitalization-weighted index for 500 largest US companies. It gives a gauge to large-cap U.S. companies. A company's weighting in S&P is calculated by dividing total of all market caps by company's market cap.

The Nasdaq Composite Index is a market-capitalization-weighted index for 3,300 equities listed on the Nasdaq stock exchange. It is a relatively more broad-based than other indices since the index covers not only the U.S. companies but also foreign-based companies.

The price to earnings (P/E) ratio is the ratio between a company's stock price and its EPS. The higher the P/E ratio, the higher price investors are willing to pay for the share. Debt to equity ratio is the percentage of company's operations being funded by debt versus the percentage being funded by equity investors. A higher debt to equity ratio means the primary funding from investors is not preferable. Return on equity (ROE) ratio is the ratio of the company's net income versus its total equity investment. The profit margin shows a company's percentage profitability [18].

To show daily graphs for the stocks, some abbreviated expressions are commonly used. "Low" and "High" means the high and low price for a day or week selected. "Last" represents the most recent price. "Vol" or "Volume" is the number of shares traded [20].

### ***1.3 Structure of This Project***

The overall structure of this project is to first research on popular investment strategies. Different strategies work for different companies' stocks, trading environment, and investors' time flexibility. Then I will research on the market background during the course of simulation and choose two strategies to compare before setting up a concrete plan for two simulations. From there, 10 companies that are traded for the simulations will be decided and introduced with their recent stock behaviors. For each week of the 7-week simulation period, I will make observations to the individual stocks and record my trading activities for both of the two simulations. In the end, an evaluation of the simulations as well as the trading strategies will be provided and the overall value of this project will be evaluated.

## ***2. Investing Strategies***

Depending on investors personal choices, they may adopt different investing strategies to maximize revenues from stock trading. Specifically, there are active trading and passive trading. Active trading strategies are to buy and sell securities in short-term movements, contracting to passive investing where investors maximize their profits by minimizing frequencies of buying and selling in long-term act [13].

### ***2.1 Day Trading***

Day trading is a type of active trading. It is the method of buying and selling stocks within the same day and no position is held overnight. Investors have 5 or 15-minutes time frames and will hold the trades for minutes or hours. They will not concern about long-term trend of economy and will simply trade in the direction of daily trends. Their job is to find a repeating profitable pattern, and then follow the pattern and exploit it.

The most volatile time in a day is the first two hours after the open and last hour before the close, so those would be the best day trading times since investors could make a lot of profit from price shifts. Day traders should risk 1% or less of their capital on each trade, which is accomplished by setting a stop loss after picking the entry point.

### ***2.2 Position Trading***

Position trading is classified as both active trading and passive trading depending on the circumstance. This strategy uses longer term charts along with other methods to determine the trend of the market. The timeframe of position trading usually lasts for months or years. Position traders are not concerned with daily fluctuations of their holdings. They observe long-term market

patterns and base their decision on whether they are likely to gain their wanted return [4]. To start position trading, investor should do a plentiful of researches on the potential companies and be confident that they have chosen the companies that they would want to spend long term monitoring and earning profits from. They should research on the companies' press releases, earning reports, and analyze their charts before they make the decision. The entry point for position trading should be a point where the trend is expected to continue an upward trajectory, such as breaking the 200-day moving average. The exit point, accordingly, is to wait until the price closes below the moving average. One of the keys to position trade is to be patience with sudden price fluctuations and focus on the price changes in the long run. There always are risks of prices passing dips or trend reversals, so position traders usually uses order types like stop losses or trailing stop.

### ***2.3 Swing Trading***

Swing trading is a type of active trading strategy that plays when a trend breaks. Swing traders buy or sell when there's price volatility as a new trend is forming. They actively seek for peaks and troughs of assets in order to predict future buy and sell motions, both by looking at historical data and current changes. This method is most effective when the stock market is sedentary and is expected to repeat the same behavior over the time. The commonly used indicators for swing trading is Bollinger Band. They observe the trading volumes and moving average on the Bollinger Bands. A down swing on the band usually signals a price decrease, since that means large amount of shares are sold; in contrary, when there is an upswing on the Bollinger Band, there is a possibility of price increase since the volume of people buying the stock has increased significantly. A sedentary market would be ideal for swing trading because there is a constant

pattern of change in prices and investors could identify the enter point and exit point with lower risks.

#### ***2.4 Scalping***

This active trading strategy makes profits by buying at the bid price – the price offered for shares- and selling at the ask price – the price that sellers are willing to accept. Scalping is a very short term strategy where traders only hold trades for minutes or even seconds. To start with scalping technique, investors should carefully analyze their potential companies, including their financial statements or discounted cash flow modeling. Scalper may trade on news or company events that could have an immediate impact on their stock prices. However, scalper mainly focuses on technical charts. They are either discretionary or system traders, where discretionary traders make decisions in real times, and system scalpers follow a scalping system without making any individual decisions. Scalpers look at the five-second chart where each price bar means five second of trading. Using the market's time and sales on the chart, they can determine when and where to make trading decisions.

#### ***2.5 Buy and Hold***

Buy and hold is a passive trading strategy where the investors simply buy stock and hold them for a long term, disregarding market fluctuations [3]. The theory behind this strategy is that since it's impossible to constantly achieve above average returns, it is pointless to make trading decisions that could result in trading of a security. Buy and hold traders believe that it's acceptable outcome if the market goes down in the near term, since the long-term trend will always be positive [1]. Buy and hold strategy also has tax benefits by avoiding fees and operating expenses comparing

to actively buying and selling. Looking back at historical data, S&P 500 provided an average annual return of 36.8% from 1960 to 2010. Even if all ease and big revenues in buy and hold method, its disadvantage should not be overlooked. Since the method disregards all the company news and losses, there is no limit to the possible losses, which could be resulted by company's bankruptcy or that the company devaluated.

### ***3. Simulation Preparation and Company Selections***

In this chapter, I will introduce my arrangement and planning for this project. The chapter will begin with the background of the simulation, introducing the economic environment at the time of the simulation. Then I will set rules for simulation, based on the options on Market Watch simulator. Buy and hold strategy is chosen as the fundamental strategy for the simulation. For comparing purposes, I will choose another strategy to conduct the second part of the simulation, and the strategy is chosen according to market environment and my personal preference. The ten companies chosen for this simulation will cover different areas such as technologies and business while some of them are expected to be responsive to the current social activities and some may not.

#### ***3.1 Simulation Background***

On March 1, 2018, President Donald Trump announced a tariff on all imported steel and aluminums from China and ignited the US-China trade war. On March 22, he announced a plan to impose 25% of tariffs on \$50 billions of Chinese goods. Although both sides agreed to a deal in May to avoid tariffs, the US turned to announce that the \$50 billion-tariffs would move forward. On August 23, the US imposed another tariffs on \$16 billions goods, and China responded with the same amount imposed on US goods. On May 15, 2019, Trump signed an order to ban Chinese telecommunication gears companies including Huawei, claiming them as threats to national security [9].

Under the impact of the trade war, the S&P 500 index decreased by 2.2% in the worst week of 2019 and the Dow lost 1.1% and Nasdaq composite dropped by 1.6% [2]. The threat that China would limit production and sales of Apple's iPhone had caused a loss of \$80 billion loss in

shareholder wealth. Although Nasdaq Composite had come back to its all-time highs, the general trend of future stock market is still like a coin flip. Figure 3.1 gave a plot of Nasdaq Composite February ~ May 2019 showing its performance in those 3 months [15].

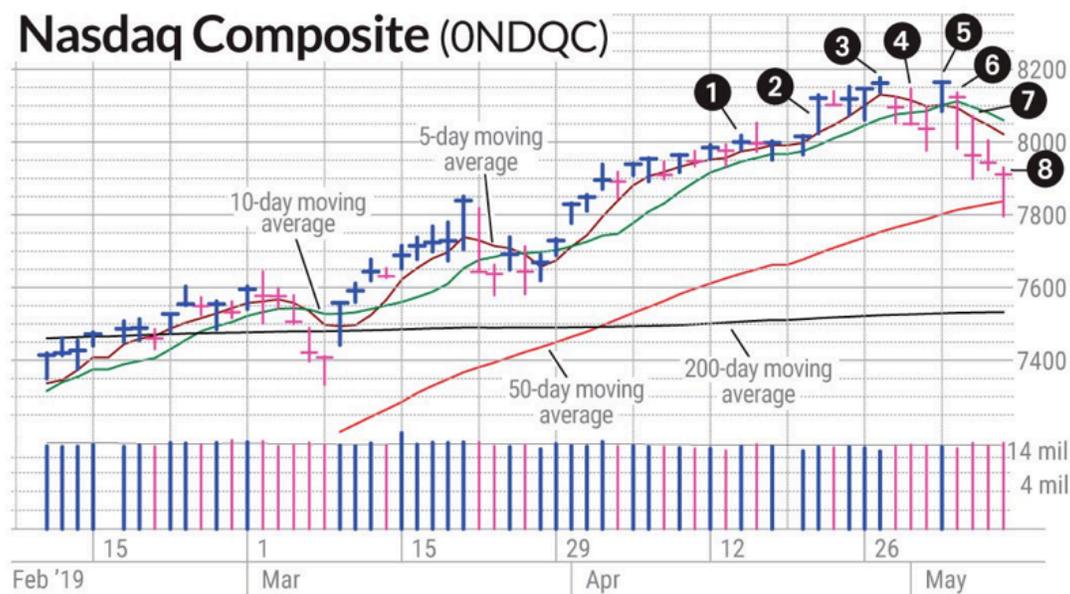


Figure 3.1 Nasdaq Composite February ~ May 2019

### 3.2 Simulation Plan

The simulation is conducted using Market Watch simulator and trading strategies used are swing trading and buy and hold. Buy and hold strategy will be used as the “controlled group” since no actions need to take place during the simulation. I decide that swing trading is a good fit for my simulation since the timeframe of this strategy is reasonable that it’s not too short like day trading, and not too long that it exceeds the 7-week period. Under the background that the stock market is currently not stable, swing trade could generate profits whenever there is a swing in the market. The simulation will start with \$100,000 in portfolio account and will last for 7 weeks from June 3 to July 19. The commission price is set to \$10 per trade and none of short selling, margin selling,

limit orders, stop loss, or partial shares is activated. To start the simulation, I will invest around %10 of \$100,000 to each of ten companies when market opens on the first day of simulation. The returned profit for swing trading is typically 20%~25%, so this will be the targeted returns for both strategies.

### ***3.3 Strategies for Simulation***

As for Buy and Hold strategy, I will invest all the money among ten companies by equal amounts and not make any other buy or sell activities over the duration of the simulation.

The fundamental indicator for swing trading is Bollinger Bands. It is composed of simple moving average(SMA) and two lines on each side of it plotted two standard deviations away from it. The Bollinger Bands reflects the market volatility through the width between bands; the wider the bands are, the more volatile the market is. The trick to use the Bollinger Bands is to observe when the price approach the upper band and then break below middle band. This is signal to a shift in market sentiment and we should sell at this candlestick's lowest point before the prices drops even more. For the buy trade, we reverse the technique and buy when we observe prices shifting from below middle band to the upper band. The following two graphs, Figure 3.2 shows when to sell and Figure 3.3 shows when to by, both points marked with green buttons [19].



Figure 3.2 Swing trading's sell strategy on Bollinger Bands.



Figure 3.3 Swing trading's buy strategy on Bollinger Bands

### 3.4 Company Profiles

#### Bank of America (BAC)

Bank of America is the second largest bank holding company in the United States based on the size of total assets. It has operated for more than 100 years and eventually took the name Bank of America in 1930, now having more than 250,000 full-time employees around the world. It works

with companies ranging from the world’s largest corporations to small-sized businesses as well as individual customers. Their services include card services, customer real estate services, deposits, global banking and markets, global commercial banking and global wealth and investment management, where global banking and markets composites the most share of the bank. Competition of the Bank of America include other major bank holding companies, credit unions, investment banks, insurance companies, mortgage banking companies, credit issuers, mutual fund companies, and new ecommerce businesses. Figure 3.4 is the basic chart of BAC stocks behavior in the past 6 months.



*Figure 3.4 BAC basic chart (past 6 months)*

### **Hilton Worldwide Holdings Inc. (HLT)**

Hilton is a large and fast-growing hospitality company, owning 5,685 properties in 113 countries. It owns, leases, manages, hotels and resorts and engages in the hotel managements and licensing of its brand to franchises. Figure 3.5 is the basic chart of HLT stocks behavior in the past 6 months.



Figure 3.5 HLT basic chart (past 6 months)

### Twitter, Inc. (TWTR)

Twitter, Inc. is a platform for public self-expression in real times. The information shared covers breaking news, entertainments, sports, politics, and everyday interests. Users join open conversations and watch clips or live-streaming events on Twitter. It provides promoters promoted services to advertise their products, also for developers a set of public APIs and embedded widgets to share their contents. Twitter operates in over 40 languages around the world and can be accessed either through their website or though mobile devices. Figure 3.6 is the basic chart of TWTR stocks behavior in the past 6 months.



Figure 3.6 TWTR basic chart (past 6 months)

### Netflix, Inc. (NFLX)

Netflix is the world leading internet entertainment service serving more than 139 million users in 190 countries. It streams TV series, documentaries and films and members can watch from any of their internet-connected services including TVs, digital video players, television set-top boxes, and mobile devices. Figure 3.7 is the basic chart of NFLX stocks behavior in the past 6 months.



Figure 3.7 NFLX basic chart (past 6 months)

### **Amaon.com, Inc. (AMZN)**

Amazon.com, Inc. is a retail sale platform for consumer products and subscriptions in North America and internationally. It sells merchandise that's resold by third-party sellers on line and in physical stores, as well as allowing sellers to sell through Amazon website as well as their own branded websites. It also sells their own electronic devices such as Kindle e-readers, Fire tablets, and Echo devices. In addition, it offers subscription memberships which offer their members free shipping, streaming movies and series and more. Figure 3.8 is the basic chart of AMZN stocks behavior in the past 6 months.



Figure 3.8 AMZN basic chart (past 6 months)

### **iQIYI, Inc. (IQ)**

iQIYI, Inc. is an online entertainment service provider under iQIYI brand in China. It provides a platform for a collection of internet videos including professionally-licensed videos as well as self-produced content. iQIYI further provides subscription memberships, online advertising, live streaming, and online gaming, literature services, and iQIYI mall where they sell third-party products through e-commerce. Figure 3.9 is the basic chart of IQ stocks behavior in the past 6 months.



Figure 3.9 IQ basic chart (past 6 months)

### Apple Inc. (AAPL)

Apple is the world leading consumer electronics and personal computer companies that designs, manufactures, and market mobile devices. It sells software, services, accessories, and third-party digital contents. It offers electronic devices such as iPad, iPhone, and iPod, and non-electronic products including iCloud, and IOS. Although the company has retails stores around the world and is a market-leading figure, it faces various risks from unstable global economic conditions, fluctuating consumer demand, worldwide competitions and supply chain disruptions.

Figure 3.10 is the basic chart of AAPL stocks behavior in the past 6 months.



Figure 3.10 AAPL basic chart (past 6 months)

### **Alibaba Group Holding Limited (BABA)**

Alibaba Group Holding Limited is an online and mobile commerce company operating in China and internationally. It operates through four key segments: Core Commerce, Cloud Computing, Digital Media and Entertainment, and Innovation Initiatives and Others. The segments altogether consist of retail and wholesale, elastic computing and database storage, Youku Tudou and UC browser business, and Tmall Genie and others. Figure 3.11 is the basic chart of BABA stocks behavior in the past 6 months.



Figure 3.11 BABA basic chart (past 6 months)

### Weibo Corporation (WB)

Weibo is a microblogging service launched by SINA in 2009. It is a social media platform for people to create, distribute, and discover contents in China. It operates through two segments: Advertising and Marketing, and Value-Added Services. It allows its users to express themselves, promote feeds and accounts for advertisers, and access to copyright content such as TV channels and online video websites. Figure 3.12 is the basic chart of WB stocks behavior in the past 6 months.



Figure 3.12 WB basic chart (past 6 months)

### AT&T Inc. (T)

AT&T Inc. is a holding company that provides telecommunication media and technology service. It operates through four segments: Communications, Warner Media, Latin America, and Xandr. It offers wireless and wireline telecom, videos, and internet services; it also sells audio programming services under the AT&T, Cricket, AT&T PREPAID, and DIRECTV brands. Through the Warner Media segment, the company produces, distributes, and licenses TV series and feature films; it produces and distributes mobile and console games as home entertainment products; and Xandr segments offers digital advertisements. Figure 3.13 is the basic chart of T stocks behavior in the past 6 months.



Figure 3.13 T basic chart (past 6 months)

## ***4. Simulation One (Swing Trading Strategy)***

Swing trading is the fundamental strategy used in simulation one. The profile balance of \$100,000 is initially evenly split among ten companies on the first day of simulation one. Throughout the simulation, I will use swing trading techniques to maximize profit. Although there could be misuse of the method at the start, I am hoping to be more familiar and more comfortable with swing trading through practice. The basic rule to use in this simulation is to look at moving average and Bollinger Band to identify whether there is a “swing” in the companies’ stocks.

### ***4.1 Week 1***

#### ***4.1.1 Observations***

For the week ended on June 14, the weekly change in Dow was -0.07%, change in S&P 500 was -0.16%, and change in Nasdaq composite was 0.52%.

On June 11, Amazon announced that they would shut food delivery service from their intense competition with GrubHub, DoorDash, and Uber Eats, where data showing an 8.6% increase in shares of GrubHub when there was only 0.4% of rise in Amazon [16]. There could be a potential raise in AMZN since the company is spending less money on the product that doesn’t lead to much profit. By looking at the chart, I notice that AMZN’s price has been slightly above the moving average throughout the last week and there was a general increasing trend comparing to the week of Jan 4 even though there was a decrease of 2.4% within the week. Figure 4.1 is the BB chart, volume chart, and RSI line by hours for AMZN in week 1.

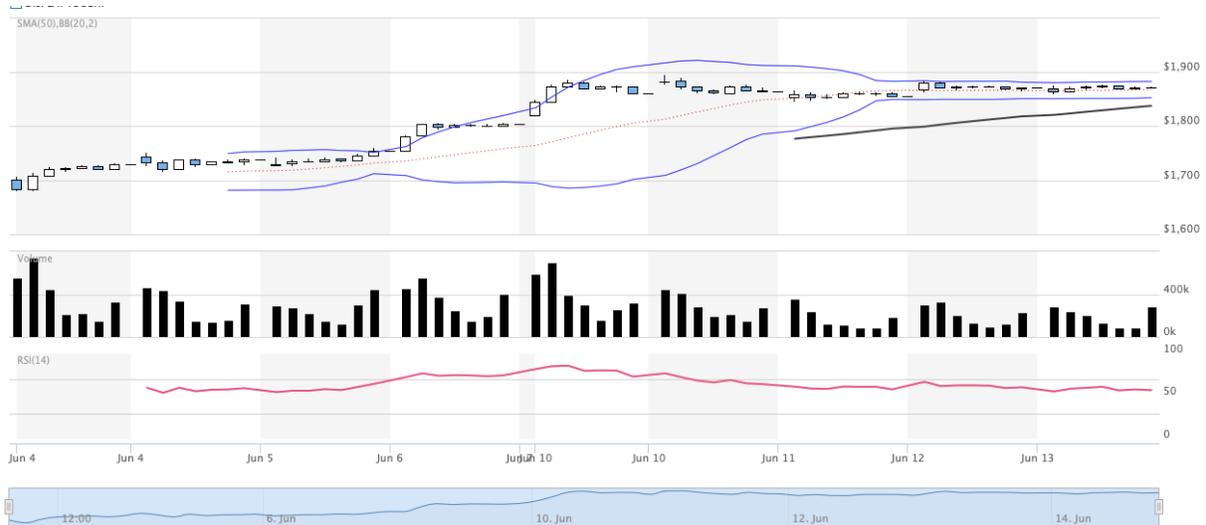


Figure 4.1 Week 1 Hourly AMZN BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

On June 13, Alibaba(Symbol: BABA) filed for Hong Kong listing, which expected to raise \$20 billion in as early as the third quarter this year [21]. I had expected an increase in BABA's stock after this announcement, however, their price went down 1.39% by the end of week and volume stayed low. Figure 4.2 is the BB chart, volume chart, and RSI line by hours for BABA in week 1.



Figure 4.2 Week 1 Hourly BABA BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

WB stocks had two swings on Jun 12 and 14, both from selling. The price had been below the moving average for the majority of the week and comes down to a 2.4% decrease in the end.

Figure 4.3 is the BB chart, volume chart, and RSI line by hours for WB in week 1.



Figure 4.3 Week 1 Hourly WB BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

A noticeable swing was in NFLX on June 10 where the trading volume raised to 7,810,261, making the third highest volume among their past month's data. Another swing in the week occurred on June 14 for IQ stocks which caused the hourly low below lower BB, and the price rose again within the next few hours, but still have -2.4% change by the end of week. AAPL stocks has not had any swings and trading volumes has not been steady and low, with a 0.73% decrease by the end of the week. Similar to AAPL, T, BAC and HLT both have low trading volume with 0.19%, 0.36%, and 0.42% increase. TWTR stocks was steady but decreased by 0.52% towards the end of the week.

### 4.1.2 Trading activities

The transaction chart from week 1(June 10-June14) is given by Table 4.1 below:

*Table 4.1 Week 1 Simulation 1 transaction table*

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceedings	Profit/ Loss	Total Cash	Total Profit
06/10/19							100,000.00	
6/10/19	AAPL	Buy	192.06	53.00	10189.18		89810.82	
6/10/19	BAC	Buy	27.86	364.00	10151.04		79659.78	
6/10/19	T	Buy	32.67	308.00	10072.36		69587.42	
6/10/19	NFLX	Buy	363.93	28.00	10200.04		59387.38	
6/10/19	BABA	Buy	158.82	64.00	10174.48		49212.90	
6/10/19	TWTR	Buy	38.34	263.00	10093.42		39119.48	
6/10/19	HLT	Buy	92.96	108.00	10049.68		29069.80	
6/10/19	WB	Buy	43.30	234.00	10142.20		18927.60	
6/10/19	IQ	Buy	18.22	555.00	10122.10		8805.50	
6/11/19	AMZN	Buy	1,868.37	4.00	7483.48		1322.02	
6/11/19	WB	Sell	44.43	188.00	8342.84	192.44	9664.86	192.44
6/11/19	BABA	Sell	162.46	15.00	2426.90	34.60	12091.76	227.04
6/11/19	NFLX	Buy	349.70	15.00	5255.50		6836.26	
6/11/19	WB	Buy	44.33	30.00	1339.90		5496.36	
6/12/19	WB	Buy	42.16	30.00	1274.80		4221.56	
6/14/19	IQ	Buy	17.88	40.00	725.20		3496.36	
6/14/19	WB	Buy	41.57	30.00	1257.10		2239.26	

After the initial position, I first sold WB and BABA stocks from the noticeable down swings in order to stop loss. Then I bought NFLX because of its significant down swing. I bought 30 shares of WB on 6/1, expecting the price to rise from the down swings. I notice the price has gone lower than the day before on 6/12, so bought another 30 shares of WB. On 6/14, a significant

down swing in IQ led me to buy 40 shares of IQ. I bought another 30 shares of WB on the 14th from another swing.

### ***4.1.3 Results***

I have traded a lot of WB shares over the week, mostly buying. However, looking back at the weekly chart, there might not have been a bunch of profit in those trades since the price didn't go back up as expected and the overall trend was actually decreasing. Same as WB, NFLX stock didn't go up to above moving average even after a big swing.

It might not have been the best decision to buy IQ shares since even if there was a down swing, there wasn't much profit afterwards and price was still below moving average. I notice that some stocks with little swings tend to have more steady growth in the end of the week, and those that have big swings tend to have a generally decrease in price. The reason why I didn't trade those "steady stocks" is because of the trading strategy I used where I only focused on swings, and the disadvantage of this strategy is thereby exposed in some way.

My plan for next week is to sell my shares over time and make sure there is around 50% of initial fund (%50,000) active for trading. Also, I will hold on to WB and NFLX shares and see whether the price will rise as expected.

## ***4.2 Week 2***

### ***4.2.1 Observations***

As of the week of June 17, the change in DJIA is -0.13%, change in S&P 500 is -0.13%, and change in Nasdaq composite is -0.24%. Although the indices have all decreased regarding the last day of this week, the market had welcomed a significant up trending with DJIA reaching as

high as 26907 points. There were two significant increase in DJIA, once on June 17 and once on June 19. The first increase is before the Fed meeting on Wednesday. Investors heard of possible positive news from the media and were wishful of an interest cut by the Fed due to the pressure. The Fed's decision later came out on Thursday, June 19, and although they decided to hold the market stable for now and announced no change in interest, they hinted a future rate cut [12]. This decision once more excited the investors and led to another upswing of the week.

Among my holdings, all the stock price went up significantly except for IQ, T, and TWTR. For T, even if there were swings and a lot of trading opportunities, the maximum price change never exceeds more than \$0.5 between each up and down, seeing the following chart. Figure 4.4 is the BB chart, volume chart, and RSI line by hours for T in week 2.



Figure 4.4 Week 2 Hourly T BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

Even more interestingly, TWTR followed a downtrend in this week when all other stocks were generally up-trending. There was minimal of transactions and most of them are sells, which led to a continuous drop in the price and no coming back.

Similar to TWTR's situation, although there were some buyings on June 17, IQ's stocks were almost always being sold rather than being bought. It is almost clear that investors don't see a lot of opportunities in IQ and TWTR stocks in the recent futures.

For the rest of my holdings, the weekly highs all went over their monthly high, which were great opportunities for me to sell and earn.

#### 4.2.2 Trading activities

The transaction chart from week 2 (June 17-June 21) is given by Table 4.2 below:

*Table 4.2 Week 2 Simulation 1 transaction table*

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceedings	Profit/ Loss	Total Cash	Total Profit
6/17/2019	AMZN	Sell	1883.61	4.00	7524.44	40.96	9763.70	268.00
6/18/2019	NFLX	Sell	360.45	15.00	5396.75	141.25	15160.45	409.25
6/18/2019	HLT	Sell	95.12	50.00	4746.00	88.00	19906.45	497.25
6/18/2019	BABA	Sell	167.91	20.00	3348.20	171.80	23254.65	669.05
6/18/2019	AAPL	Sell	200.07	30.00	5992.10	220.30	29246.75	889.35
6/18/2019	BAC	Sell	28.68	108.00	3087.44	68.56	32334.19	957.91
6/20/2019	NFLX	Sell	367.98	28.00	10293.44	93.40	42627.63	1051.31

All my transactions in this week are sells and the incentive is to build up my account to future investments. Luckily, there has been good surges in this week and the prices of sell transactions are earning profits for me. I see those stocks passing the highest price among the past month, and I don't want to risk to wait for the price to go even higher since the stocks were bought at a rather high price level, which is why I still decide to sell those stock without earning large

percentage of profit. I eventually have \$42667.62 in the account and the total profit made in this week is \$884. TWTR, IQ and T now each shares 10% of profile, WB shares 5%, BAC shares 7%, HLT shares 5%, and AAPL and BABA each shares 4%.

### ***4.2.3 Results***

In the following week, the U.S and China's leaders are meeting at G20 summit, and it seems likely that another tariff won't be imposed. The meeting is likely to produce more optimism that the market will continue to upward trajectory in the near term [7]. The trends in IQ, T, and TWTR are countering what I have expected, and if their prices don't seem to rise any further in the following week, I would consider selling all of them, even for low percentage of profit. I will also take chances investing in big swings using large portion of my account. In the meantime, I still need to give attention to making profits from the holdings that I bought on the first simulation day since the bought in prices were hard for current trend to go beyond.

## ***4.3 Week 3 (June 24~28)***

### ***4.3.1 Observations***

President Trump and Chinese leader Xi has talked at the G-20 summit and both sides agreed to a truce in the trade war. Trump said that he would not introduce any more tariffs on imported Chinese goods and would also allow U.S. companies to do business with and supply gears to Huawei. Although this decision will benefit the economy, it doesn't necessarily benefit the stock market as much. This news could put a pause to the soaring market since stock market is fully pricing in an interest rate cut, which is at the end of July on the Fed meeting.

In terms of patterns of the stocks in this simulation week, T and IQ resembles similar patterns where they both have a slight downswing on June 25 until their prices started to go up on June 26 and peaked on June 27. Comparing to T and IQ, BAC has a more obvious downswing on June 25 with a rapid rise on June 27. Figure 4.5 is the BB chart, volume chart, and RSI line by 15 minutes for BAC in week 3. HLT, BABA, AAPL, NFLX and AMZN all have a rapid upswing on June 26 and their prices rest of the week is fairly smooth and calm. However, even with the upswing, their price levels mostly remained on the price as the first day of the week. IQ, on the other hand, had an 0.13% increase of price over the period of this week.



*Figure 4.5 Week 3 15 minutes BAC BB(Bollinger Band), Volume, and RSI(Relative Strength Index)*

TWTR stocks by far is the most unpredictable and controversial stocks comparing to all my other holdings. Its price did not go up at all on June 27 like other stocks, and conversely, it went down, resulting in a 0.01% loss in the end of the week. Shown in Figure 4.6 is the BB chart, volume chart, and RSI line by 15 minutes for TWTR in week 3.



Figure 4.6 Week 3 15 minutes TWTR BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

### 4.3.2 Trading activities

The transaction chart from week 3(June 24 – June 28) is given by Table 4.3 below:

Table 4.3 Week 3 Simulation 1 transaction table

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceedings	Profit/ Loss	Total Cash	Total Profit
6/24/2019	IQ	Sell	21.05	595.00	12514.75	1667.45	55142.38	2718.76
6/27/2019	BAC	Sell	29.00	256.00	7414.00	281.84	62556.38	3000.60

The BAC and IQ stocks both had a down swing on June 25, and I notice the price is the similar to the price when I bought those stocks two weeks ago, so I think it is a good chance for trading since there is a definitive soar in price on Friday before the G20 summit takes place. Therefore, I sold all my holdings of IQ and BAC.

### **4.3.3 Results**

Since TWTR stocks are behaving abnormally with little changing patterns, I should hold my TWTR stocks for as short as I don't lose money from selling them. Due to the delay in another tariff, AAPL would not be hit on their release of iPhone since China is a big market for Apple. Apple price is also in a big cup-with-handle base with a 215.41 buy point, so there is a hope for AAPL stocks to go up in the upcoming week. U.S.-listed Chinese companies should also benefit from less pressure from Chinese economy.

## **4.4 Week 4 (July 1~5)**

### **4.4.1 Observations**

Followed by the good news of a truce in the trade war is a leap in all my stocks' prices at the market open on Monday. However, there was not a lot of fluctuations in price since the market open. Figure 4.7 is the 15 minutes BB lines, trading volumes, and RSI line for AAPL in week 4. As it shows in the figure, the gaps between Bollinger Bands becomes smaller and smaller, and trading volumes are extremely low for most of the time. The similar pattern is also observed in the others of my chosen companies where the price line almost stays flat and there were no swings that were signs for trade.



Figure 4.7 Week 4 15 minutes AAPL BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

#### 4.4.2 Trading Activities

No trading activities were done in this week due to a lack of swing trading incentives.

#### 4.4.3 Results

Looking at the soar in the trend lines on Monday, I realized that I would have created a great trading opportunity if I had bought in some holdings before the G20 summit. However, it was still a safe move not to buy in before the summit since the conversation between China and U.S. could have gone the opposite way. With the June jobs report released last Friday, it is shown that the U.S. economy has created 224,000 jobs in June, far exceeding the expected 160,000 positions [17]. The bright-looking job market, however, seems to ease the pressure for the Fed to slash rate and has decreased the chance for the interest rate cut in the end of July. In the upcoming week, Jerome Powell will deliver his semi-annual Monetary Policy Report on Wednesday and Thursday, where he is likely to give more clues about the rate cutting decision [6].

## 4.5 Week 5 (July 8~12)

### 4.5.1 Observations

At his testimony to Congress, the Fed's Chairman Powell said that the U.S. is suffering from uncertainty caused by the trade tensions and weak global growth, hinting that the interest rate cut may be taking place soon. Even with the unemployment rate at five-decades low and stock indices at record high, the Fed is under great political and market pressure to cut the rate, so what the Fed could do is to increase monetary stimulus in order to reduce risks of future damage. The expected rate cut, as predicted, is likely to be 25 basic points [11]. An interest rate cut would mean a growth in the money in the bank stocks where people are more likely to borrow money, moreover, a growth in stock market as a whole. For AMZN stocks, the good news is the Amazon Prime Day taking place on Monday and Tuesday of the next simulation week, which could mean a great opportunity for an upswing.

In this week, trading volumes for T, HLT, WB, AAPL, BABA, TWTR and AMZN stayed low and overall price change in percentage stayed fairly low, where AMZN changed by 0.5%.

Figure 4.8 is the 15 minutes BB lines, trading volumes, and RSI line for AMZN in week 5.



Figure 4.8 Week 5 15 minutes AMZN BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

BAC stock was very volatile this week, with the highest 15-minute trading volume reaching 4,169,142 shares. There are two obvious up-trend from mid-BB to upper-BB, once on Tuesday and once on Thursday. Figure 4.9 is the 15 minutes BB lines, trading volumes, and RSI line for BAC in week 5.



Figure 4.9 Week 5 15 minutes BAC BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

#### 4.5.2 Trading activities

The transaction chart from week 5(July 8 – July 12) is given by Table 4.4 below:

Table 4.4 Week 5 Simulation 1 transaction table

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceedings	Profit/ Loss	Total Cash	Total Profit
7/9/2019	AMZN	Buy	1979.54	15	29703.10		32853.28	
7/9/2019	BAC	Buy	29.29	550	16119.50		16733.78	

Knowing the upcoming Amazon Prime Day, I decided to reserve some holdings for AMZN. I waited for a day to see the trend of AMZN stocks, and it remained flat on Monday until it started to increase on Tuesday and continued to go up until Thursday. I traded at noon of Tuesday when

I noticed the price kept rising after 11am when price usually starts to fall back, which could mean a continuous rising in price.

After observing an upswing from BAC's mid-BB to up-BB at 10am on Tuesday, I predicted there would be an uptrend forming. Therefore, I waited until the price to fall a little lower than market open and then purchased 550 shares.

### ***4.5.3 Results***

I have very positive outlook for the two transactions made in this week, first because of the Amazon Prime Day, and secondly because the bank stocks should have a price increase with the rate cut becoming more affirmative. To be safe, I will try to sell them no later than Tuesday before the event loses effect.

## ***4.6 Week 6 (July 15~19)***

### ***4.6.1 Observations***

With the stronger-than-expected reports on New York and Philadelphia Federal Reserve District manufacturing released on Wednesday, July 17, there is a fade in people's anticipation in a rate cut in the end of July. The stronger-than-expected consumer inflation, retail sales, and job reports mean that there is more time for the Fed to determine and observe whether the economy is doing well after the rate rise, which make it less likely for them to initiate a big rate cut at their meeting on July 30 and 31. After this report released, there is a sudden downtrend in all my stocks except for BAC and AAPL. There is an overall drop in all the stocks in this week, and Dow ended with a 0.25% decrease. Trading volumes of IQ, HLT, NFLX, AMZN, WB, and T remains low and their BB bands stayed narrow except for the drop on Thursday. Seeing Figure 4.10 is the 10

minutes BB lines, trading volumes, and RSI line for T in week 6, and it exemplifies the shape of IQ, HLT, AMZN, NFLX, and WB.



Figure 4.10 Week 6 10 minutes T BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

Different from other stocks, BAC and IQ did not end the week with a downtrend. BAC price came up after a E dividend on July 17, and IQ price went back up almost immediately after the price drop in the morning of the 18th<sup>b</sup>. IQ did have a slope pointing downward in the first three and half days of the week, but it slowly pulls back up and stopped the downtrend. BAC stock was decreasing in the first two days until a e-dividend was assigned and soon recovered to the week open level.

#### 4.6.2 Trading activities

The transaction chart from week 6(July 15 – July 19) is given by Table 4.5 below:

*Table 4.5 Week 6 Simulation 1 transaction table*

Date	Symbol	Buy/ Sell	Price	Share s	Net Cost/ Proceedings	Profit/ Loss	Total Cash	Total Profit
7/15/2019	WB	Sell	43.14	136	5857.04	(6.56)	22590.82	2994.04
7/16/2019	AAPL	Sell	205.74	23	4722.02	304.64	27312.84	3298.68
7/16/2019	AMZN	Sell	2019.41	15	30281.15	578.05	57593.99	3876.73
7/16/2019	BABA	Sell	175.32	29	5074.28	468.50	62668.27	4345.23
7/16/2019	BAC	Sell	29.42	550	16171.00	51.5	78839.27	4396.73
7/16/2019	HLT	Sell	99.39	58	5754.62	362.94	84593.89	4759.67
7/16/2019	T	Sell	33.63	308	10348.04	275.68	94941.93	5035.35
7/16/2019	TWTR	Sell	38.42	263	10094.46	1.04	105036.39	5036.39

Since this week is the second to last simulation week, I tried to sell all the holdings in case any price drop in the last simulation week that would leave me no choice but to sell with loss. Therefore, I sold most of my holdings when they were at a higher price than the bid price, and all of them except for WB are sold on Tuesday. Since WB have had a great drop last month, I think it was risky to keep it for longer and thus sold them on Monday, even if the price is still lower than the bid price. TWTR almost made no profit and its price has always not exceeded the bought price.

#### **4.6.3 Results**

The WB stocks generated a loss in the account, which is because of my failing to sell them at better price and my mistake in buying more and more of their shares when it was not forming a steading increasing trend. Although it is not a big loss, I could have prevented it if I have sold them

earlier and not waited and wished the price would even higher; also, I did not correctly identify the swing when I added more shares of WB in week 2. Since I have no holdings and all the profits money is available for me again, I should watch really closely for any swings in next week and take advantage of them. I predict that it would be a quiet week next week since investors might be hesitant to make moves before they have any clearer signals of what the Fed would decide.

#### ***4.7 Week 7 (July 22~26)***

##### ***4.7.1 Observations***

In week 7, trading volumes of BAC, AAPL and AMZN maintained at a consistent level with no significant ups or downs, when on the other hand, BABA and IQ stocks were fairly volatile over this week. TWTR price stayed at a constant level with low trading volume until there was a boost at its market open on Friday, rising nearly \$5.3 during the after hours, which is due to its Q2 report that was newly released and showed revenue estimates raising 18% year-over-year to \$841 million, exceeding the estimated \$829 million [5]. With the release of Q2 report for NFLX, the company confirms that they will launch less-expensive mobile only plans in India [14], and this move could lead NFLX to valuable partnerships and give a boost to its growth, and the growth is visible in this week's price chart where its price had a 0.07% growth and seems to grow continually. T stocks had gone up after an E dividend on July 24, as well as HLT. Adding on to its dividend, HLT released its Q2 report on July 25, showing an 8.3% of year-over-over growth in revenue and 19.8% of growth in net income. Seeing Figure 4.11 below is the 10 minutes BB lines, trading volumes, and RSI line for HLT during week 7.



Figure 4.11 Week 7 10 minutes HLT BB(Bollinger Band), Volume, and RSI(Relative Strength Index)

#### 4.7.2 Trading activities

The transaction chart from week 7(July 22 – July 26) is given by Table 4.6 below:

Table 4.6 Week 7 Simulation 1 transaction table

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceedings	Profit/ Loss	Total Cash	Total Profit
7/25/2019	HLT	Buy	95.63	500	47825.00		57211.39	
7/26/2019	HLT	Sell	96.80	500	48390.00	565	105601.39	5601.39

My thought behind trading HLT stocks is that there was a candlestick on BB moving from below mid-line towards upper line and the price drops slightly and soon come back up on Thursday. This is a signal for an entry and a price increase. After I bought the 500 shares, I left them overnight and sold them at around 11am since price is usually the highest between 10~11am.

#### 4.7.3 Results

My last investment in HLT proves to be profitable and it earned me \$565. I predicted it would be a quiet week this week, but I was unfortunately wrong. Although AAPL, BAC, AMZN

and TWTR stocks kept a low trading volume most of the time, the price of most stocks changed significantly after the release of their Q2 reports. Although my simulation is ending this week, I see uptrends in BAC, HLT, TWTR, and T in the upcoming week. The Fed is also releasing their decision for interest rate change next Wednesday, and this decision might hugely change the dynamic of the stock market.

## 5. Simulation Two (Buy and Hold)

Simulation two adopts buy and hold strategy, and I won't make any transactions during the 7-week period until the last day. The starting position is the same as simulation one, where \$100,000 is evenly shared by 10 companies' stocks. All the stocks will be sold on the last day of simulation.

### 5.1 Week 1 Report

Table 5.1 below is transactions for initial trading position:

*Table 5.1 Week 1 Simulation 2 transaction table*

Date	Symbol	Trade Type	Volume	Price	Net Cost
6/10/19	AAPL	Buy	53	\$192.06	89810.82
6/10/19	BAC	Buy	364	\$27.86	10151.04
6/10/19	T	Buy	308	\$32.67	10072.36
6/10/19	NFLX	Buy	28	\$363.93	10200.04
6/10/19	BABA	Buy	64	\$158.82	10174.48
6/10/19	TWTR	Buy	263	\$38.34	10093.42
6/10/19	HLT	Buy	108	\$92.96	10049.68
6/10/19	WB	Buy	234	\$43.30	10142.2
6/10/19	IQ	Buy	555	\$18.22	10122.1
6/11/19	AMZN	Buy	4	\$1,868.37	7483.48
				Account Balance	\$1322.02

Table 5.2 below concludes each company's change of price in week 1:

Table 5.2 Week 1 Simulation 2 price change table

	Week Open	Week Last	Change	Change%	Shares	Weekly Profit/ Loss
AAPL	191.80	192.74	0.94	0.00	53	49.82
AMZN	1822.00	1869.67	47.67	0.03	4	190.68
BABA	158.78	158.10	-0.68	-0.00	64	-43.52
BAC	27.86	28.04	0.18	0.01	364	65.52
HLT	92.92	93.42	0.50	0.01	108	54.00
IQ	18.23	17.89	-0.34	-0.02	555	-188.70
NFLX	363.65	339.73	-23.92	-0.07	28	-669.76
T	32.69	32.35	-0.34	-0.01	308	-104.72
TWTR	38.35	36.15	-2.20	-0.06	263	-578.60
WB	43.14	41.41	-1.73	-0.04	234	-404.82
					Overall Profit/Loss	-1630.10

There is a loss of 1760.92 over the period of first week. Half of the stocks' price decreased and they decreased at a larger rate than those that increased. The advantage of buy and hold strategy is not showing yet.

### 5.2 Week 2 Report

Table 5.3 below concludes each company's change of price in week 2:

*Table 5.3 Week 2 Simulation 2 price change table*

	Week Open	Week Last	Change	Change%	Shares	Weekly Profit/ Loss
AAPL	192.9	198.78	5.88	0.03	53	311.64
AMZN	1876.5	1911.3	34.80	0.02	4	139.20
BABA	157.53	167.55	10.02	0.06	64	641.28
BAC	28.01	28.12	0.11	0.00	364	40.04
HLT	93.31	96.14	2.83	0.03	108	305.64
IQ	18.04	18.15	0.11	0.01	555	61.05
NFLX	342.69	369.21	26.52	0.08	28	742.56
T	32.25	32.45	0.20	0.01	308	61.60
TWTR	36.26	35.02	-1.24	-0.03	263	-326.12
WB	41.47	43.21	1.74	0.04	234	407.16
					Overall Profit/Loss	2384.05

There was a general uptrend in all the stocks except for TWTR, who ended the week with an -0.03% decrease in price. There was a rise in the prices of other stocks, although it was minimal. The market changes have not shown that buy and hold strategy is a go to as of week 2 since the up and down changes during the week far exceeds the overall price change in the week. However, with more positive news being released regarding possible lower interest rate, there could be chance for the stock market to continue the trajectory in the following weeks and hopefully see an overall uptrend by the end of next week.

### **5.3 Week 3 Report**

Table 5.4 below concludes each company's change of price in week 3:

*Table 5.4 Week 3 Simulation 2 price change table*

	Week Open	Week Last	Change	Change%	Shares	Weekly Profit/ Loss
AAPL	198.54	197.92	-0.62	-0.00	53	-32.86
AMZN	1912.66	1893.63	-19.03	-0.01	4	-76.12
BABA	168.40	169.45	1.05	0.01	64	67.20
BAC	28.08	29.00	0.92	0.03	364	334.88
HLT	96.30	97.74	1.44	0.01	108	155.52
IQ	18.20	20.65	2.45	0.13	555	1359.75
NFLX	370.27	367.32	-2.95	-0.01	28	-82.60
T	32.49	33.51	1.02	0.03	308	314.16
TWTR	35.19	34.90	-0.29	-0.01	263	-76.27
WB	43.50	43.55	0.05	0.00	234	11.70
					Overall Profit/Loss	1975.36

There is a negative change rate of price in AMZN, NFLX and TWTR and a slight loss in AAPL holdings. With Trump's decision coming out that he would not impose another tariff on Chinese goods, there is hope for an increase in BAC, AAPL and AMZN. There is also an expected interest rate cut at the end of July, which is the end of this simulation, so there is chance for the overall price of stocks to go up towards the time when I sell all my holdings.

#### **5.4 Week 4 Report**

Table 5.5 below concludes each company's change of price in week 4:

*Table 5.5 Week 4 Simulation 2 price change table*

	Week Open	Week Last	Change	Change%	Shares	Weekly Profit/ Loss
AAPL	203.28	204.25	0.97	0.00	53	51.41
AMZN	1922.98	1943.1	20.12	0.01	4	80.48
BABA	175.86	173.29	-2.57	-0.01	64	-164.48
BAC	29.65	29.27	-0.38	-0.01	364	-138.32
HLT	99.00	100.6	1.60	0.02	108	172.80
IQ	21.60	20.20	-1.40	-0.06	555	-777.00
NFLX	373.32	380.55	7.23	0.02	28	202.44
T	33.81	34.30	0.49	0.01	308	150.92
TWTR	35.50	36.26	0.76	0.02	263	199.88
WB	45.34	43.92	-1.42	-0.03	234	-332.28
					Overall Profit/Loss	-554.15

There is a slight overall loss from price changes in this week. Among all holdings, IQ had the highest percentage of loss of 0.06%, which is still not a high volatility rate. There was a drastic soar at market open because of the agreement in truce of trade war that what announced on last Saturday, and since there was not any news released that would swing the market in the rest of the week, the trend of my holdings remained flat and stable. The jobs report for June came out and showed that 224,000 jobs were created in the last month, providing an evidence in postponing the Fed's rate cut in the end of this month due to the fact that there is seemingly less pressure to slash the interest rates. If the Fed decides to cut rate, they will likely cut by only 25 basis points instead of the formerly predicted 50 basis points.

### **5.5 Week 5 Report**

Table 5.6 below concludes each company's change of price in week 5:

*Table 5.6 Week 5 Simulation 2 price change table*

	Week Open	Week Last	Change	Change%	Shares	Weekly Profit/ Loss
AAPL	200.94	203.24	2.30	0.01	53	121.90
AMZN	1934.12	2010.02	75.90	0.04	4	303.60
BABA	170.21	169.09	-1.12	-0.01	64	-71.68
BAC	29.01	29.44	0.43	0.01	364	156.52
HLT	100.27	99.54	-0.73	-0.01	108	-78.84
IQ	19.81	19.65	-0.16	-0.01	555	-88.80
NFLX	378.20	373.24	-4.96	-0.01	28	-138.88
T	34.13	33.65	-0.48	-0.01	308	-147.84
TWTR	36.04	37.83	1.79	0.05	263	470.77
WB	43.03	42.38	-0.65	-0.02	234	-152.10
					Overall Profit/Loss	374.65

This week's change in price continues to remain tiny, resulting in only \$374.65 of overall profit. Among ten companies, AMZN and TWTR has brought the most variations, 0.04% and 0.05%. However, with the Fed's Chairman Powell's testimony being delivered, it has been more clear that the Fed is highly likely to execute a rate cut in the end of this month, even if the unemployment has far gone below the expectations. With the simulation ending in two weeks which is exactly on the last week of July, buy and hold method may generate a large amount of profit from an overall trajectory of the stock market, benefiting from a lower interest rate.

### ***5.6 Week 6 Report***

Table 5.7 below concludes each company's change of price in week 6:

Table 5.7 Week 6 Simulation 2 price change table

	Week Open	Week Last	Change	Change%	Shares	Weekly Profit/ Loss
AAPL	204.09	202.57	-1.52	-0.01	53	-80.56
AMZN	2021.40	1965.00	-56.40	-0.03	4	-225.60
BABA	171.50	173.00	1.50	0.01	64	96.00
BAC	29.50	29.41	-0.09	-0.00	364	-32.76
HLT	99.69	94.54	-5.15	-0.05	108	-556.20
IQ	19.85	18.70	-1.15	-0.06	555	-638.25
NFLX	372.94	315.10	-57.84	-0.16	28	-1619.52
T	33.66	32.78	-0.88	-0.03	308	-271.04
TWTR	38.00	36.77	-1.23	-0.03	263	-323.49
WB	42.53	40.39	-2.14	-0.05	234	-500.76
					Overall Profit/Loss	-4152.18

This week's overall loss has been the greatest among the past four weeks, ending with a - \$4152.18 loss. Among them, NFLX had caused the most loss which is 0.16%, and IQ has lost its 0.06%. While the Fed meeting is taking place on July 30~31, the simulation is ending a week before that. The upcoming week might not be very volatile since investors are most likely waiting to hear the Fed's decision before they make a move. Comparing to week 1 table, the price of the stocks had all increased except for WB. The waiting time for buy and hold strategy seems to have paid off, no matter how many ups and downs there have been in the past 6 weeks.

### 5.7 Week 7 Report

Table 5.8 below concludes each company's change of price in week 7:

Table 5.8 Week 7 Simulation 2 price change table

	Week Open	Week Last	Change	Change%	Shares	Weekly Profit/ Loss
AAPL	205.23	207.75	2.52	0.01	53	133.56
AMZN	1972.00	1943.05	-28.95	-0.01	4	-115.80
BABA	173.50	178.79	5.29	0.03	64	338.56
BAC	29.29	30.37	1.08	0.04	364	393.12
HLT	94.76	97.22	2.46	0.03	108	265.68
IQ	18.73	19.01	0.28	0.01	555	155.40
NFLX	312.70	335.85	23.15	0.07	28	648.20
T	32.75	34.16	1.41	0.04	308	434.28
TWTR	36.91	41.53	4.62	0.13	263	1215.06
WB	40.50	40.07	-0.43	-0.01	234	-100.62
					Overall Profit/Loss	3367.44

Table 5.9 below is transactions for final trading position:

*Table 5.9 Week 7 Simulation 2 transaction table*

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceedings	Profit/ Loss	Total Cash	Total Profit
7/26/2019							1322.02	
7/26/2019	AAPL	Sell	207.75	53	11000.75	811.57	12322.77	811.57
7/26/2019	AMZN	Sell	1943.05	4	7762.2	278.72	20084.97	1090.29
7/26/2019	BABA	Sell	178.79	64	11432.56	1258.08	31517.53	2348.37
7/26/2019	BAC	Sell	30.37	364	11044.68	893.64	42562.21	3242.01
7/26/2019	HLT	Sell	97.22	108	10489.76	440.08	53051.97	3682.09
7/26/2019	IQ	Sell	19.01	555	10540.55	418.45	63592.52	4100.54
7/26/2019	NFLX	Sell	335.85	28	9393.8	-806.24	72986.32	3294.3
7/26/2019	T	Sell	34.16	308	10511.28	438.92	83497.6	3733.22
7/26/2019	TWTR	Sell	41.53	263	10912.39	818.97	94409.99	4552.19
7/26/2019	WB	Sell	40.07	234	9366.38	-775.82	103776.37	3776.37

Looking at the price change table, I observe that WB and AMZN are the only two stocks that resulted in losses, both having a -0.01% change over the week. Among the growing stocks, TWTR has increased the most in price with a 0.13% growth. Comparing to price change in the past few weeks, this week has had the most overall growth. Right before the market close of the last simulation day, I sold all my holding for this simulation. From the transaction table, I see that starting with similar amount of investment, BABA has generated the most profits and none of the holdings has caused a loss in the profiles. Eight of the stocks that were bought on the first day of the simulation have had made profits over the 7-week period on different levels and NFLX and WB have brought loss.

## ***6. Comparisons and Analysis***

After 7-week of simulation, I will compare the results of two trading strategies and carefully analyze the advantages and disadvantages of them. I will also reflect on my simulation process and analyze what I have done right and mistakes I have made. In the end, I will draw conclusions on which strategy is superior in this experiment and what I have learned from this experience.

### ***6.1 Simulation Analysis***

The simulation has helped me become familiar with the logistics of stock market and usage of swing strategy and buy and hold strategy. I started off thinking that in order to predict the trend of price changes, I need to monitor each company news, including any of their financial decisions and social decisions. However, although some of company news still affects their stocks, most of the big swings and shifts in the market are due to the Fed decisions, job reports, and diplomatic relations. It seems like governmental actions have a bigger and more direct impact on the overall market than other factors. Company news could direct changes in their stocks, but it depends on the type and how closely they are financially related. For example, AMZN had boosted its price on its prime day, and most companies' stocks have increased or decreased of some sort after their Q2 report were released. Or I can conclude that investors are tend to invest in the companies that are expected to do well or have an impactful event that immediately makes a lot of money.

In terms of company selections, I didn't especially chose the ones that were good fit for buy and hold or swing method since I wanted to keep randomness in the results so I can have various of observations. However, another approach to help me understand the strategies better is probably to choose 5 companies that are good fit for each of the strategy. In this way I can

experiment more with company selections for specific trading method and have an even more thorough understanding of the two approaches. In addition, in order to “control variables”, I split profile money evenly across 10 companies and bought them all at the market open of the first simulation day. This move might have controlled the variables for the comparison experiment, but it could be unfair for the swing trading, since it is all about timing and freedom to sell and buy. By making this decision, I bought the stocks at a fairly high price levels, where the price level entered a downtrend immediately after that, and I had to wait for the price to rise up again, which took a long time and some stocks seldom reached the bought price. Another loss caused by this decision was that since I invested almost 100% of the initial account, there was almost no available fund for me to do more investing until I waited for price to rise up and sold some of the holdings. So for a better outcome and experience next time, I could try investing in 5 carefully selected companies for swing strategy and 5 for buy and hold strategy, and instead of using up all the profile money on the first day, I could wait for a good swing signal before investing.

## ***6.2 Strategies Analysis***

Both strategies have generated some profits in the simulation. The resulting profits are \$5601.39 for swing trading and \$3776.37 for buy and hold, which is 5.6% and 3.77% of the initial account total. Figure 6.1 and 6.2 below conclude the amount profits or loss generated from each companies/ holdings and the percentage they occupy in the profits total.

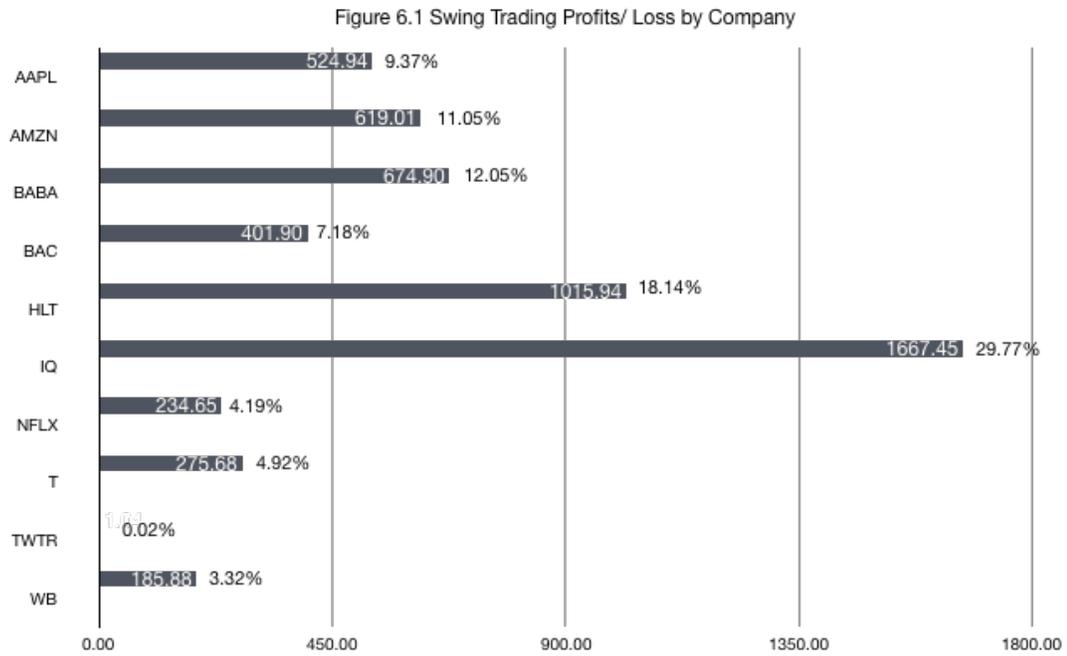


Figure 6.1 Swing Trading Profits/Loss by Company

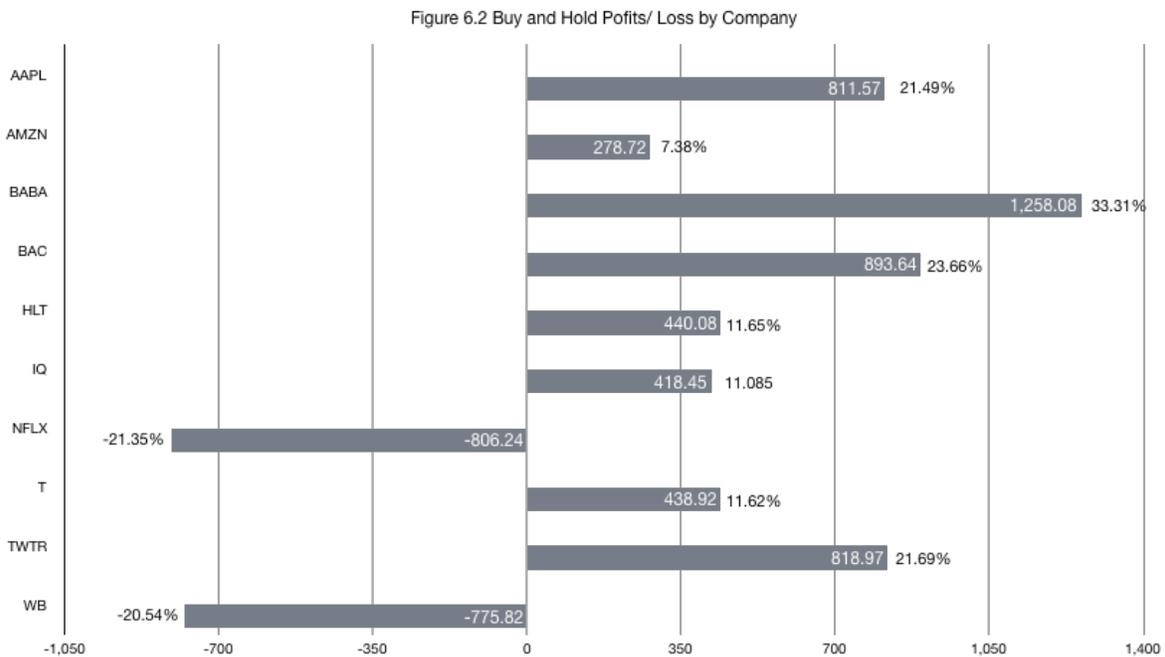


Figure 6.2 Buy and Hold Profits/ Loss by Company

At a glance, I notice huge disparities between the graphs. IQ made the most profits in swing trading and BABA made the most profits in buy and hold. AAPL, BABA, BAC, T, and TWTR

earned more profits using buy and hold method than swing trading. The reason why I couldn't earn as much profit using swing trade is that I was being cautious about losing money from waiting for too long to sell stocks, so I decided to sell them once they are at the price where they can generate fair amount of profit. Another reason for not earning more from those five stocks is that their trading volumes stayed low for most of the time instead of experiencing swings, which doesn't give me enough incentives while I am following swing trading rules. On the other hand, NFLX and WB caused a huge loss that takes up almost 40% of the total profits in second method while they made up 8.2% of the profits using method one. This observation shows advantage of swing trading that since investors are closely watching changes in stock market, they can quickly decide to stop loss when they see a negative signal. For the stocks that have earned more profits using swing trading, including AMZN, HLT, and IQ, they were traded following the trend for multiple times, which generated much more profits than how much their price eventually increased by during the simulation.

Another key point to make note of is the financial environment during the simulation. I was lucky enough to experience multiple good news for stock market where U.S.-China trade war first came to ease, positive tone from the Fed, and strong quarterly reports. Those factors built to the overall rise in the market, which resulted in all the profits in buy and hold strategy. The news also benefited swing trading by shifting market ups and downs, and there could have been much more profit in those swings if I successfully grasped on them.

In conclusion, buy and hold strategy can be a great operation-free and profitable investing technique to use as long as the investor has chosen the right companies and right time to put their bids. A trait that swing trading possesses that buy and hold doesn't is that investors can stop loss

promptly. Also, by gripping on the right trend to invest, swing trading could make larger amounts at high frequencies or in short time.

### ***6.3 Assessment of Goals***

The goals I have set up for myself were to gain knowledge of the stock market, learn about basic investing strategies, and understand how stock market reacts to changes in financial world. Firstly, I have gained necessary information in order to read the stock market through this project. I learned meanings of key stock market indexes such as Nasdaq composite, DJIA, and S&P 500, and know how to fetch the indications to change in market through their readings. Second of all, I gained techniques in using swing trading and buy and hold trading strategies to maximize profits through the 7-week of practice, and have learned their pros and cons after carefully analyzing their outcomes, also learning from mistakes and misuse of those techniques. In the meanwhile, by observing market transformations and comparing them to real-times news, I understand the pattern of market changes in regard to little tweaks in social and financial world.

## ***7. Conclusion***

By simply looking at the resulting profits of swing trading and buy and hold strategies, swing trading has generated more profits and exceeded the other method by \$1825.02, and this result is under the circumstance that the market is volatile for most of the simulation period, the trade war eased to temporary peace, and the Fed has released multiple good news that encouraged investors. Buy and hold strategy is also proven powerful in some cases, and I learned that choosing the matching company and social environment for the investing strategy is crucial in order to earn profits.

Through the pre-simulation research and continuous practice in use of trading strategies, I am familiar with the stock market, know its relationship to political and financial world, and am now equipped with tools and techniques to analyze the stocks.

My experience in completing this project is precious and it has taught me important lessons from stock related knowledge to concurring missteps and achieving better work. I would like to thank Professor Tang for his continuous guidance, advice, and patience. What I learned from this experience would benefit me in my future pursuits and shall remain with me.

## References

1. Beers, James Chen and Brian. "How a Buy-and-Hold Strategy Works." *Investopedia*, Investopedia, 5 May 2019, [www.investopedia.com/terms/b/buyandhold.asp](http://www.investopedia.com/terms/b/buyandhold.asp).
2. Cbs/ap. (2019, May 23). Stock market down as U.S.-China trade war takes center stage. Retrieved from <https://www.cbsnews.com/news/stock-market-down-today-as-u-s-china-trade-war-takes-center-stage/>
3. Chen, James. "What Is Passive Investing?" *Investopedia*, Investopedia, 10 July 2019, [www.investopedia.com/terms/p/passiveinvesting.asp](http://www.investopedia.com/terms/p/passiveinvesting.asp).
4. Cockerham, Ryan. "Position Trading vs. Swing Trading." *Finance*, 31 Mar. 2019, [finance.zacks.com/position-trading-vs-swing-trading-2755.html](http://finance.zacks.com/position-trading-vs-swing-trading-2755.html).
5. Correspondent, S. (2019, July 26). Twitter earnings Q2 2019. Retrieved from <https://news.alphastreet.com/twitter-earnings-q2-2019/>
6. (2019, July 7). Fed Chair Powell testifies - What to know in the week ahead. Retrieved from <https://finance.yahoo.com/news/fed-chair-powell-testifies-what-to-know-in-the-week-ahead-180541984.html>
7. (2019, June 23). G20 leaders meet, Powell speaks - What to know in the week ahead. Retrieved from <https://finance.yahoo.com/news/g-20-powell-speaks-what-to-know-in-the-week-ahead-173602425.html>
8. Hayes, Adam. "A Breakdown on How the Stock Market Works." *Investopedia*, Investopedia, 25 June 2019, [www.investopedia.com/articles/investing/082614/how-stock-market-works.asp](http://www.investopedia.com/articles/investing/082614/how-stock-market-works.asp).
9. Heeb, Gina. "It's Been More than a Year since the US-China Trade War Started. Here's a Timeline of Everything That's Happened so Far. | Markets Insider." *Business Insider*,

Business Insider, 23 May 2019, [markets.businessinsider.com/news/stocks/us-china-trade-war-timeline-updated-tariffs-timeline-2019-5-1028227195?utm\\_source=msn.com&utm\\_medium=referral&utm\\_content=msn-slideshow&utm\\_campaign=bodyurl](https://markets.businessinsider.com/news/stocks/us-china-trade-war-timeline-updated-tariffs-timeline-2019-5-1028227195?utm_source=msn.com&utm_medium=referral&utm_content=msn-slideshow&utm_campaign=bodyurl).

10. Hur, Johnson. "History of The Stock Market." *From The Beginning To Present Time*, 4 Dec. 2018, [bebusinessed.com/history/history-of-the-stock-market/](http://bebusinessed.com/history/history-of-the-stock-market/).
11. Hyerczyk, J. (2019, July 20). Fed's Powell, Williams: Override the Models, Cut Rates and Do it Swiftly. Retrieved from <https://finance.yahoo.com/news/fed-powell-williams-override-models-195538034.html>
12. Kinahan, J. J. (2019, June 19). Fed Holds Rates Steady; Hints At Future Cuts At June Meeting. Retrieved from <https://www.forbes.com/sites/jjkinahan/2019/06/19/fed-holds-rates-steady-hints-at-future-cuts-at-june-meeting/#4002b6396a97>
13. Kristina Zucchi, CFA. "4 Common Active Trading Strategies." *Investopedia*, Investopedia, 25 June 2019, [www.investopedia.com/articles/active-trading/11/four-types-of-active-traders.asp](http://www.investopedia.com/articles/active-trading/11/four-types-of-active-traders.asp).
14. Levy, A. (2019, July 22). Netflix Is Launching a Low-Priced Plan in India. Retrieved from <https://www.fool.com/investing/2019/07/22/netflix-is-launching-a-low-priced-plan-in-india.aspx>
15. Nielsen, J. (2019, May 10). Will Trade War Fears Spark A Bear Market? Retrieved from <https://www.investors.com/research/swing-trading/bear-market-trade-war-fears/>
16. Panchadar, A. (2019, June 12). Amazon to shut restaurant delivery service in U.S. Retrieved from <https://www.reuters.com/article/us-amazon-com-restaurants/amazon-to-shut-restaurant-delivery-service-in-u-s-idUSKCN1TC252>

17. (2019, July 5). The Fed just got the green light to cut rates. Retrieved from <https://finance.yahoo.com/news/june-jobs-report-labor-market-slack-gives-fed-green-light-to-cut-rates-135850126.html>
18. “Stock Market - What Is the Stock Market and How It Works.” *Corporate Finance Institute*, [corporatefinanceinstitute.com/resources/knowledge/trading-investing/stock-market/](http://corporatefinanceinstitute.com/resources/knowledge/trading-investing/stock-market/).
19. TradingStrategyGuides. (2018, April 5). Swing Trading Strategies that Work. Retrieved from <https://tradingstrategyguides.com/swing-trading-strategies-that-work/>
20. “What's in a Stock Chart?” *Investor's Business Daily*, Investor's Business Daily, [www.investors.com/ibd-university/chart-reading/chart-contents/](http://www.investors.com/ibd-university/chart-reading/chart-contents/).
21. Zhu, J. (2019, June 13). Alibaba files for HK listing that may raise \$20 billion as soon as... Retrieved from <https://www.reuters.com/article/us-alibaba-listing-hongkong/alibaba-files-for-hk-listing-that-may-raise-20-billion-as-soon-as-third-quarter-source-idUSKCN1TE0M2>