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Stock Market Simulation

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Abstract

In this Interactive Qualifying Project, a group of three were tasked to research and conduct a 10-week stock market simulation using three different trading methods: Scalp Trading, Dollar-cost averaging, and Position trading. The group first studied the history of US stock markets and then dove deeper into their respective trading methods. Three simulations were run using the same four stocks: Apple (AAPL), Microsoft Corp (MSFT), Nvidia Corporation (NVDA), and Tesla (TSLA). Each simulation started with a portfolio value of \$100,000 or \$200,000. Throughout the simulation, transactions were documented and results were reported results on a weekly basis. At the end of the simulations, results were compared and it was concluded that Position trading was the most successful, with a net profit of 14.1%. In contrast, Scalp trading and Dollar-Cost averaging produced a 1.4% and 4.4% increase, respectively. The experiences learned will be helpful for future investment in the stock market.

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Chapter 1. Introduction

1.1. General Plan/Overview

The goal of this project is to gain some basic understandings of the stock market by conducting a 10-week stock market simulation. We will perform simulations using different methods of trading, (Scalping, Dollar cost Averaging, and Position trading) over a 10-week period and then analyze and compare the results from those trading methods. From the simulation, we will determine which trading method generated more profit or suffered smaller loss (in a down market). To get an adequate understanding of the stock market as a whole and the trading methods themselves, we will research the stock market history and its major influences as well as research on trading methods. Furthermore, we will research the skills needed to analyze techniques for assigning a company's value. To compare each trading method fairly, variables throughout the test must stay constant, otherwise comparing would be difficult. Each trading method can only be comparable when the stocks being traded are the same. The technology sector is a fast-growing and volatile sector. Tech companies are associated with innovation and inventions, whether that be new products or services, technology is everywhere. In technology we decided collectively to trade 4 individual stocks. Apple, NVidia, Tesla, and Microsoft. For the simulation software, we decided to use Investopedia stock simulator since it is free and user-friendly. This simulation tool enables us to trade in the stock market in real-time using real-world companies. At the start of the simulation, each team member will be given \$100,000 to trade. Each person from the team will then perform his/her own method of trading. At the end of the 10-week simulation period, all team members will gather the data, analyze it, and reach a conclusion.

Over the span of 10 weeks, we will see four different trading methods competing with one another to achieve the largest net profit gain. We hypothesize that day trading will produce the

largest profits for multiple of reasons. A 10-week simulation in the stock market world is in fact very short. Truly, anything under 2 years could be considered a small sample size when looking at market bull and bear runs that have lasted decades sometimes. With this short simulation, we believe that a trading method that requires time and patience would not produce the best outcomes. Dollar cost averaging and position trading are long term methods. These two methods will result in slow gains, but with the added protection of less risk.

1.2. Stock Market History

In the late 1400's, Belgium becomes the center of international trades. This then leads to 1611 when the first modern stock trading is created in Amsterdam. The Dutch East India company is the first publicly traded company in many years and the first modern stock trading is created in Amsterdam. The Dutch East India company is the first publicly traded company in many years. In the late 1700's a small group of merchants made buttonwood tree agreement. They meet daily to buy and sell stock and bonds and in the 1790's the Philadelphia stock exchange is formed, helping the economy of the US. During the 1890's the Dow Jones Industrial Average has been created. Then at the 1970's trading starts on another US. stock exchange, the National Association of Securities Dealers. In the 1980's corporate buyouts insurance helped prices in the market run up until Oct. 19, what becomes known as "Black Monday." And finally, during the 2000's - the stock market crashes after the boom of the housing market. This is what mainly happened during the history of the stock market, and it is the main small description about the history.

1.3 Stock Market Crashes in History

The historical performance of the stock market, specifically the S&P 500 index, has greatly fluctuated over the years. Since 1926 we have seen eight major bear markets and nine bull markets. So, what is a bear market, you may ask. A bear market is the belief or the outlook that stocks will fall. Technically a bear market is when the entire market falls 20% from recent highs. And counter to that a bull market is optimism. When a market rises by at least 20% after two 20% falls. The average bull market period lasts about 9 years. With an average cumulative return of 470%. In contrast the average bear market lasts around 1.5 years with an average cumulative loss of negative 41%. Although past performance is no guarantee of future results, looking at the history of the market's recessions and expansions gives a healthy perspective on the benefits of investing.

1.4 Factors Influencing the Stock Market

A stock price is the price of a single share of many saleable equity shares of a company [1]. The stock price is either the highest amount one is willing to pay or the lowest amount one could purchase. Usually, it's an active observable measure that allows investors to judge the performances of a firm.

Similar to the price of everyday commodities, the share price of a company is constantly fluctuating. Investments could fluctuate daily; usually, a price change of a few percentage points is expected. The basic behavior of the stock market is as fundamental as the law of supply and demand. Supply and demand determine the prices of shares of a company. The equilibrium price of a share of stock strikes a balance between those who think the stock is worth more and those who think it is worth less than the current price. If a company's profits are expected to increase, the demand for the stock increases while the supply of shares decreases, causing the equilibrium

price to rise. The opposite would occur if a company's profits were expected to decrease [2]. Essentially, if there are more sellers than buyers, the share price will drop on the other hand, if there are more buyers than sellers, then naturally, the price will rise. Such behaviors of investors are what cause volatility and an unpredictable market.

Major factors that would influence an investor's decisions are the company's financial performance, broad economic trends, interest rates, inflation, natural calamities, and much more [3].

Chapter 2. Methodology

Anyone who participates in stock trading has his or her own method of trading. In this chapter, we will introduce some of the most common techniques used by traders. This includes scalping, dollar cost averaging, and position trading. Details of these methods are given below.

2.1 Scalping

Scalp trading is one of the most used types of trading in the past few years. This strategy consists of profiting from minor price changes in the price of a stock. Traders that use this technique rely on technical analysis like MACD or candlestick charts. Also, people that use this strategy place from twenty to a few hundred in a single day. The scalping trading strategy wouldn't be as effectful if the trader doesn't have a good exit method or strategy. This strategy uses larger positions sizes for a smaller price gain while holding the share for the least time as possible.

This method is performed intraday or within the day in which the main goal is to buy the share at bid or ask price and then quickly sell it for a few cents or dollars higher and getting the profit. The holding time of the good varies from a few seconds up to several minutes. This method is usually taken care off by fast paced traders and it requires timing execution and precision.

2.2 Dollar Cost Averaging

Dollar-cost averaging, also known as DCA, is an investment strategy where a fixed dollar amount is invested regardless of share price. The dollar amount invested can fluctuate, but the frequency of investments stays relatively constant. One of the benefits of this strategy is it allows risk to spread over time. The market's heavy fluctuations have a minimal impact on the portfolio due to the purchases triggered at different intervals. DCA helps with discipline and reduces the emotional temptation that many investors struggle with. Dollar-cost averaging could be very useful to those who are patient investors looking at the long term or even for immature investors looking

to get their feet wet. Figure 2.2.1 gives a comparison between Dollar-Cost Averaging and Lump-Sum Investing.

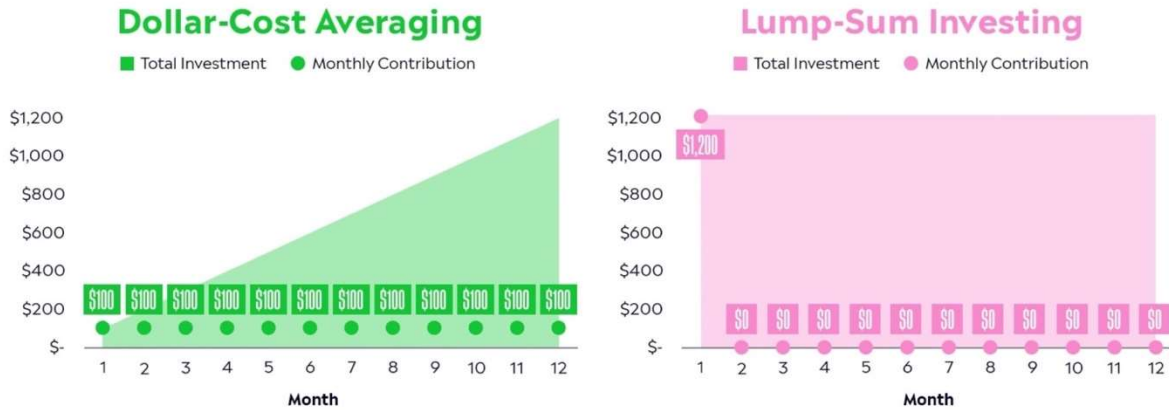


Fig.2.2.1 Annual Comparison Between Dollar-Cost Averaging and Lump-Sum Investing

2.3 Position Trading

Position trading is a trading strategy that allows investors to hold a position for a long period of time to achieve profit. Therefore, position traders are less concerned with short-term fluctuations in price. Commonly known as trend followers, these traders will work to identify a trend and an investment that will yield profits from it. They then buy and hold that investment until the trend peaks. A successful position trader correctly identifies the entry and exit prices well-advanced. He or she is also able to control the risks by using stop-loss orders.

Position traders may utilize technical analysis, fundamental analysis, or a combination of both techniques to make trading decisions. They sometimes rely on other factors like general market trends and historical price patterns to identify investments in which they believe will appreciate in the future.

Because this is a 10-week simulation, stocks will be traded with a higher frequency compared to the normal position trading.

Chapter 3. Company Profile

In this chapter we provide the histories and profiles of 4 companies selected for our simulation: Apple, Microsoft, Nvidia and Tesla. These companies belong to the information technology sector. The technology sector covers companies that are involved in different categories of the technological innovation field. They focus on creating software or providing services that bring technological solutions, however there is some of them that focus on building the equipment, hardware and components that make this technology possible. Apple and Microsoft have been fighting for the top of this list {3.1}. Included facts are year that they were founded, founders, top selling products, annual revenue, and other important information about said companies including charts of the stock's progress in the past years.

3.1 Apple

Apple Inc., formerly Apple Computer, Inc., is a multinational corporation that is a digital distributor of media content and produces consumer electronics, personal computers, servers, and computer software. Apple Stores is a retail chain owned by the company. The iPhone smartphone, iPad tablet computer, and Macintosh computer line are Apple's primary product lines.

Apple Computer was primarily a manufacturer of personal computers for more than three decades, including the Apple II, Macintosh, and Power Mac lines; however, during the 1990s, it experienced rocky sales and low market share. After being fired from Apple in 1985, Jobs returned to the company in 1997 when Apple bought his company NeXT. The following year, he became the company's interim CEO, which later became permanent. Jobs then introduced a new corporate philosophy of easily recognizable products and straightforward design, starting with the first iMac in 1998.

Apple established itself as a leader in the consumer electronics and media sales industries with the successful introduction of the iPod music player in 2001 and the iTunes Music Store in 2003. As a result, the word "Computer" was dropped from the company's name in 2007. Additionally, the company is well-known for its iOS line of media players, tablets, and smartphones, which began with the iPhone and continued with the iPod Touch and iPad. Apple was the world's largest publicly traded company by market capitalization as of June 30, 2015, with an estimated value of US\$1 trillion as of August 2, 2018. In 2010, Apple generated US\$65 billion in worldwide revenue, rising to US\$127.8 billion in 2011 and \$156 billion in 2012.

Below is Apple's stock performance with 1-year (Figure 3.1.1) and 5-year periods (Figure 3.1.2).

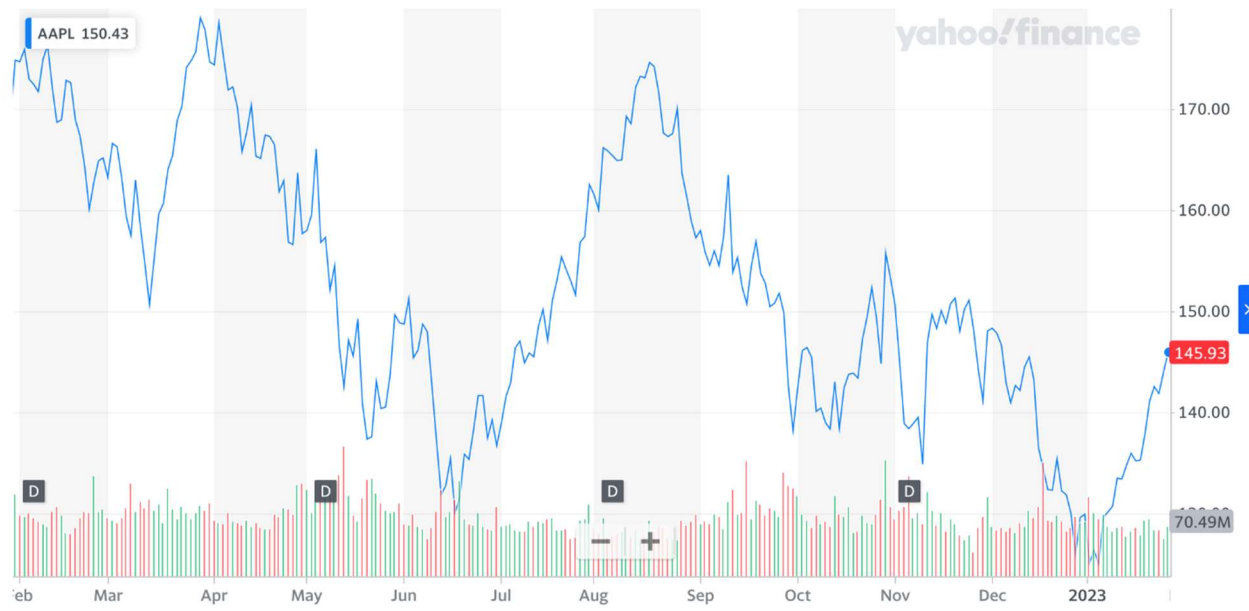


Figure 3.1.1 Apple 1-year performance



Figure 3.1.2 Apple 5-year performance

3.2 Nvidia

Nvidia Corporation was founded on April 5th, 1993, by Jen-Hsun Huang, Curtis Priem, and Christopher Malachowsky. This company has its headquarters in Santa Clara, California, and it is known for their development of integrated circuits commonly used in electronic game consoles and personal computers. This company is also the leading manufacturer of graphic processing units (GPUs). Nvidia's GPUs general use is for edge to cloud computing, but they are also used in supercomputers. The first product that put the company in the map was the RIVA series GPUs which came out in 1997. Then in 2007 Microsoft Corporation chose Nvidia to develop their graphics cards for their new Xbox console. Nvidia's latest products are 2 next-gen GPU's, the GeForce RTX 4090, and the GeForce RTX 4080. For the year of 2020, Nvidia reported earnings of \$2.796 billion with a \$10.918 billion revenue. The market cap for Nvidia is 406.54 billion US dollars. The range of the year 2022-2023 for Nvidia's stock this far is from \$108.13 – \$346.47 US

dollars. On Figures 3.3.1 and 3.3.2 (below) we can see the progress of Nvidia's stock in the past year and in the past 5 year respectively.



Figure 3.2.1: Nvidia 1-year performance



Figure 3.2.2: Nvidia 5-year performance

3.3 Tesla

Tesla (TSLA) is the largest vehicle manufacturer by market cap. With a whopping market cap of 867 billion, not only is it the top auto company but one of the most valuable companies in the world. Tesla showing, it's not just a car company but, more importantly, an energy and technology company. Tesla has developed new technology in batteries and solar energy. Branching from just vehicle manufacturing, they have also touched the real estate market with solar power shingles, and battery-powered homes. However, looking at (Figure 3.3.1) Tesla has been suffering a huge loss after hitting an ultimate high mid 2021. This by many analysts believe this is a test of support, and the value of the company has just begun growing. Tesla's future is bright, and with a brilliant owner like Elon Musk, the world will live in today is just the beginning of his innovations.

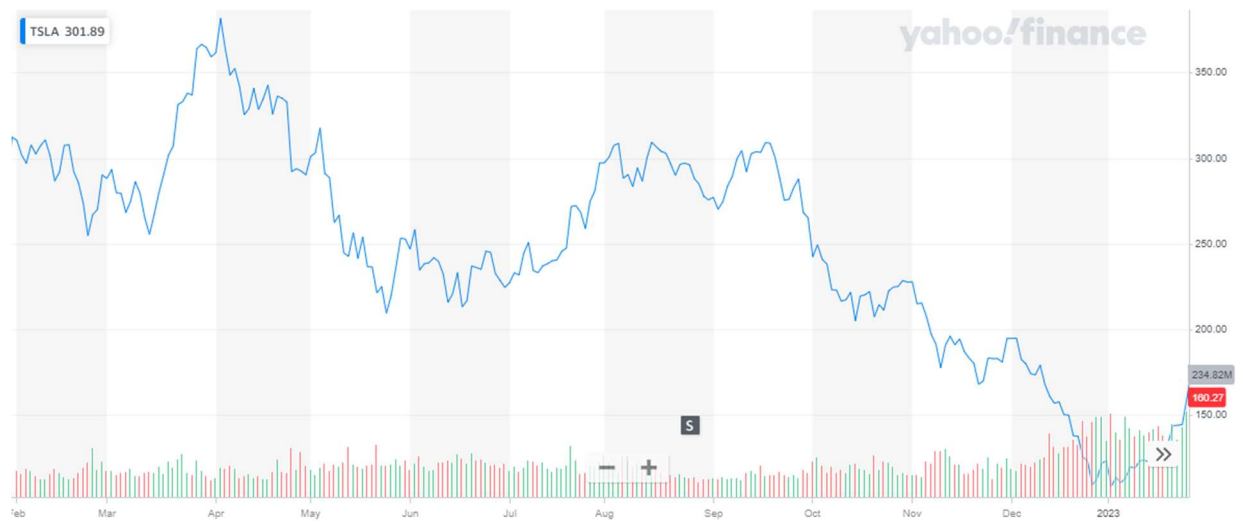


Figure 3.3.1 Tesla 1-year performance

Tesla shows the tendonous gains it's made over the past years by becoming both a vehicle and energy company seen in (Figure 3.3.2). Tesla was originally founded by Marc Tarpenning and

Martin Eberhard in 2003. Two Silicon Valley engineers sold their eBook company to fund Tesla. Elon soon became an early investor, taking on important roles in developing the company. Marc and Martin had a simple but genius plan where they would start manufacturing high-performance cars with lithium batteries first and use the revenue accumulated to fund more affordable cars. However, Tesla fell into a hole when customer manufacturing costs surpassed the budget. The once highly anticipated "car of the future" was looking doubtful. CEOs quickly sold their stock, and shortly after, Elon Musk took over in October of 2008. Elon made drastic changes, starting off by cutting 25% of workers and raising nearly 40 million dollars to fund their first electrical car release, the Roadster. The first milestone of Elon's career, the Roadster quickly became a favorite in the US.



Figure 3.3.2 Tesla 5-year performance

Tesla revolutionized the EV world, and soon it was IPOed on the Nasdaq in 2010. Soon after, the Model S and Model X vehicles were released, attracting a wider audience. This propelled Tesla to heights never seen before, surpassing Ford in market value just seven years after its IPO.

Tesla's mission is to accelerate the production and use of renewable energies. With its recent inclusion in the S&P 500 and mass production strategies, the ambition and outlook will take the company far.

3.4 Microsoft

Microsoft Corporation is an American multinational tech corporation focusing on the production of computers, software, smartphones, and other services headquartered at the Microsoft Redmond campus in Washington state. Microsoft's most famous software products are the Windows operating systems, the MS Office suite and IE and Edge web browsers. Their flagship hardware products are the Xbox video game consoles and Microsoft Surface touchscreen personal computers. The company was founded by the well-known billionaire Bill Gates and his childhood friend Paul Allen on April 4, 1975. Its goal is to develop and sell BASIC interpreters for the Altair 8800. Microsoft rose to prominence in the 1980s with MS-DOS, which became a significant contender in the market for computer operating systems. The company went public in 1986, and since then its value has subsequently risen over the years. As a result, three billionaires and over 12,000 millionaires are created among Microsoft employees. It is currently one of the biggest tech companies in the world with a market capitalization of \$1.774 trillion. This makes Microsoft the third most valuable company on the planet. At the time of this writing, the company's stock price is \$237.92 per share. Below is Microsoft 1-year performance (Figure 3.4.1) and Microsoft 5-year performance (Figure 3.4.2)



Figure 3.4.1 Microsoft 1-year performance

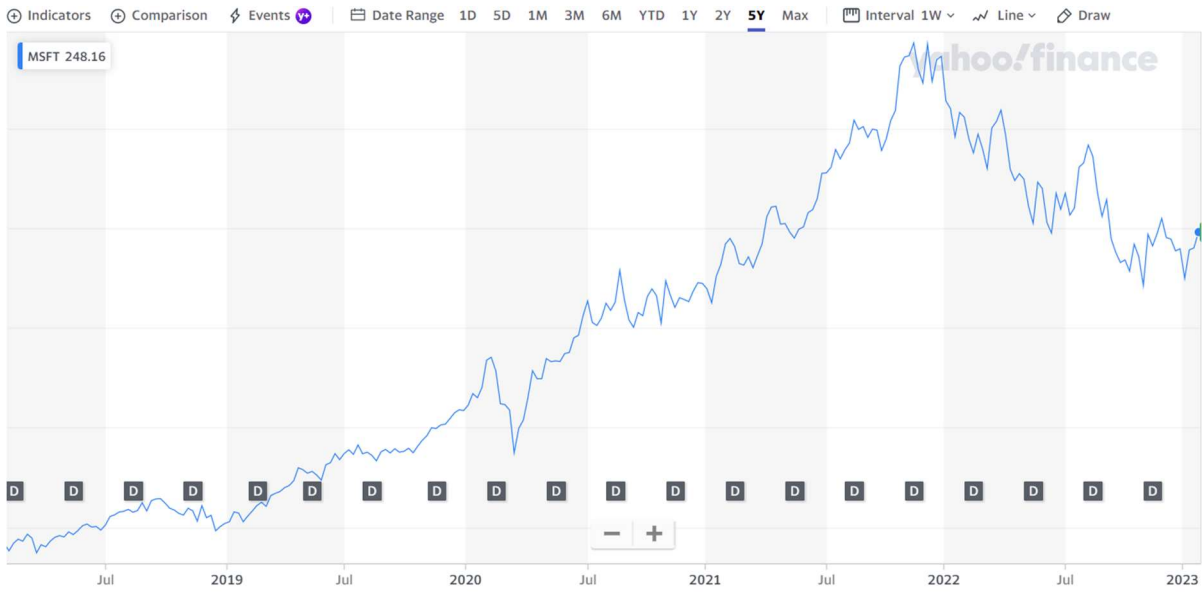


Figure 3.4.2 Microsoft 5-year performance

Chapter 4. Scalp Trading

4.1 Simulation

We will use the scalping trading method in the span of 10 weeks with \$100,000 US dollars to start with. Due to the fact that the simulator the group is using (Investopedia) takes around twenty minutes to process the transaction, each trade will take around forty minutes. The trades will have five minutes in between them and four trades will be done every day, three times a week, every week we will choose a different company from our list (Microsoft, Nvidia, Tesla and Apple) and scalp a total of 12 times per week. The last 2 weeks of the 10-week trial we will trade with all our companies at the same time. The time of the trades will vary depending of the status of the market and the stock's status, also the use of moving average convergence divergence (MACD) and the relative strength index (RSI) will be used.

4.1.1 Week One (Nvidia first trial), October 3rd – 9th, 2022

For the first week we trade Nvidia units. With \$100,000 US dollars we started buying five hundred units but after we realized the financial consequences that it may bring we switch to a hundred units. The twelve buys were spread out in three days, buying four units per day. This we was successful resulting in a total profit of \$375.18 US dollars. We will go into week two with a total cash of \$100,375.18 US dollars. See table below for information about the buying process (Table 4.1.1.1).

Table 4.1.1.1 Scalp trading record week 1 (Nvidia first trial)

Date	Symbol	Buy/ Sell	Price	Share	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/4							100000	
10/5	NVDA	Buy	128.66	500	64,330.20		35,669.80	
10/5	NVDA	Sell	129.86	500	64,930.00	599.80	100,599.80	599.80
10/5	NVDA	Buy	130.39	100	13,105.99		87,561.30	
10/5	NVDA	Sell	131.30	100	13,130.00	91.50	100,691.30	691.30
10/5	NVDA	Buy	131.06	100	13,105.99		87,585.31	
10/5	NVDA	Sell	130.53	100	13,053.00	(52.99)	100,638.31	638.31
10/5	NVDA	Buy	132.17	100	13,217.35		87,420.96	
10/5	NVDA	Sell	132.61	100	13,261.00	43.65	100,681.96	681.96
10/6	NVDA	Buy	132.08	100	13,208.42		87,473.54	
10/6	NVDA	Sell	132.13	100	13,213.00	4.58	100,686.54	686.54
10/6	NVDA	Buy	132.08	100	13,208.42		87,478.12	
10/6	NVDA	Sell	132.13	100	13,213.00	4.58	100,691.12	691.12
10/6	NVDA	Buy	133.03	100	13,303.00		87,388.12	
10/6	NVDA	Sell	132.46	100	13,245.65	57.35	100,633.77	633.77
10/6	NVDA	Buy	132.75	100	13,275.00		87,358.77	
10/6	NVDA	Sell	133.01	100	13,301.00	26.00	100,659.77	659.77
10/7	NVDA	Buy	124.73	100	12,473.04		88,168.73	
10/7	NVDA	Sell	124.76	100	12,476.00	2.96	100,662.73	662.73
10/7	NVDA	Buy	125.80	100	12,579.77		88,082.96	
10/7	NVDA	Sell	124.76	100	12,476.00	(103.77)	100,558.96	558.96
10/7	NVDA	Buy	125.55	100	12,554.90		88,004.06	
10/7	NVDA	Sell	124.63	100	12,463.01	(91.89)	100,467.07	467.07
10/7	NVDA	Buy	125.55	100	12,554.90		87,912.17	
10/7	NVDA	Sell	124.63	100	12,463.01	(91.89)	100,375.18	375.18

4.1.2 Week Two (Apple first trial), October 10th – 16th, 2022

The second week, the group traded Apple units. We bought and sold a thousand-two-hundred units in the span of three days, buying four each day. This week was successful bringing a profit of \$467.11 US dollars. The total cash to go into week three will be \$100,842.29 US dollars.

See table below for details on the purchases (Table 4.1.2.1)

Table 4.1.2.1 Scalp trading record week 2 (Apple first trial)

Date	Symbol	Buy/Sell	Price	Share	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
10/10							100,375.18	
10/11	AAPL	Buy	140.68	100	14,067.50		86,307.68	
10/11	AAPL	Sell	140.22	100	14,022.00	(45.50)	100,329.68	(45.50)
10/11	AAPL	Buy	140.68	100	14,067.50		86,262.18	
10/11	AAPL	Sell	140.51	100	14,051.00	(16.50)	100,313.18	(62.00)
10/11	AAPL	Buy	140.44	100	14,044.00		86,269.18	
10/11	AAPL	Sell	141.05	100	14,105.00	61.00	100,374.18	(1.00)
10/11	AAPL	Buy	140.20	100	14,020.02		86,354.16	
10/11	AAPL	Sell	141.05	100	14,105.00	84.98	100,459.16	83.98
10/12	AAPL	Buy	139.20	100	13,919.50		86,539.66	
10/12	AAPL	Sell	139.63	100	13,962.96	43.46	100,502.62	127.44
10/12	AAPL	Buy	139.20	100	13,919.50		86,583.12	
10/12	AAPL	Sell	139.82	100	13,981.50	62.00	100,564.62	189.44
10/12	AAPL	Buy	139.60	100	13,959.50		86,605.12	
10/12	AAPL	Sell	140.07	100	14,007.09	47.59	100,612.21	237.03
10/12	AAPL	Buy	139.60	100	13,959.50		86,652.71	
10/12	AAPL	Sell	140.07	100	14,007.09	47.59	100,659.80	284.62
10/13	AAPL	Buy	135.91	100	13,591.00		87,068.80	
10/13	AAPL	Sell	136.42	100	13,642.00	51.00	100,710.80	335.62
10/13	AAPL	Buy	136.25	100	13,625.00		87,085.80	
10/13	AAPL	Sell	136.36	100	13,636.00	11.00	100,721.80	346.62
10/13	AAPL	Buy	136.35	100	13,635.00		87,086.80	
10/13	AAPL	Sell	136.54	100	13,653.50	18.50	100,740.30	365.12
10/13	AAPL	Buy	136.42	100	13,642.00		87,098.30	
10/13	AAPL	Sell	137.44	100	13,743.99	101.99	100,842.29	467.11

4.1.3 Week Three (Microsoft first trial), October 17th – 23rd, 2022

The third week we traded Microsoft units and followed the plan, but the method of using excel and looking at the chart method was used in this week (recommended by the professor). The units were bought in the span of three days. This week was also successful with a total profit of \$201.00 US dollars. We will go into week four with a total cash of \$101,043.29 US dollars. See Table 4.1.3.1 below for details.

Table 4.1.3.1 Scalp trading record week 3 (Microsoft first trial)

Date	Symbol	Buy/Sell	Price	Share	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
10/16							100,842.29	
10/17	MSFT	Buy	238.05	100	23,805.00		77,037.29	
10/17	MSFT	Sell	238.10	100	23,810.00	5.00	100,847.29	5.00
10/17	MSFT	Buy	237.82	100	23,782.00		77,065.29	
10/17	MSFT	Sell	237.95	100	23,795.00	13.00	100,860.29	18.00
10/17	MSFT	Buy	237.71	100	23,771.00		77,089.29	
10/17	MSFT	Sell	237.73	100	23,773.00	2.00	100,862.29	20.00
10/17	MSFT	Buy	235.73	100	23,573.00		77,289.29	
10/17	MSFT	Sell	237.71	100	23,771.00	198.00	101,060.29	218.00
10/18	MSFT	Buy	235.65	100	23,565.00		77,495.29	
10/18	MSFT	Sell	235.50	100	23,550.00	(15.00)	101,045.29	203.00
10/18	MSFT	Buy	234.48	100	23,548.00		77,497.29	
10/18	MSFT	Sell	235.32	100	23,532.00	(16.00)	101,029.29	187.00
10/18	MSFT	Buy	235.36	100	23,536.00		77,493.29	
10/18	MSFT	Sell	235.42	100	23,542.00	6.00	101,035.29	193.00
10/18	MSFT	Buy	235.36	100	23,536.00		77,499.29	
10/18	MSFT	Sell	235.43	100	23,543.00	7.00	101,042.29	200.00
10/19	MSFT	Buy	237.18	100	23,718.00		77,324.29	
10/19	MSFT	Sell	237.26	100	23,726.00	8.00	101,050.29	208.00
10/19	MSFT	Buy	237.30	100	23,730.00		77,320.29	
10/19	MSFT	Sell	237.42	100	23,742.00	12.00	101,062.29	220.00
10/19	MSFT	Buy	237.26	100	23,726.00		77,336.29	
10/19	MSFT	Sell	237.01	100	23,701.00	(25.00)	101,037.29	195.00
10/19	MSFT	Buy	237.05	100	23,705.00		77,332.29	
10/19	MSFT	Sell	237.11	100	23,711.00	6.00	101,043.29	201.00

4.1.4 Week Four (Tesla first trial), October 24th – 30th, 2022

For the fourth week we traded Tesla units. The trades were divided in three days but in this week the day Friday was tried for the first time in scalping to see if it had any difference, and the only two losses were in that day. The week was still successful with a total profit of \$95.00 US dollars. The total cash that will carry over week five will be \$101,138.29 US dollars. See Table 4.1.4.1 below for details.

Table 4.1.4.1 Scalp trading record week 4 (Tesla first trial)

Date	Symbol	Buy/ Sell	Price	Share	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/24							101,043.29	
10/25	TSLA	Buy	219.31	100	21,931.00		79,112.29	
10/25	TSLA	Sell	219.43	100	21,943.00	12.00	101,055.29	12.00
10/25	TSLA	Buy	219.65	100	21,965.00		79,090.29	
10/25	TSLA	Sell	219.70	100	21,970.00	5.00	101,060.29	17.00
10/25	TSLA	Buy	219.57	100	21,957.00		79,103.29	
10/25	TSLA	Sell	219.64	100	21,964.00	7.00	101,067.29	24.00
10/25	TSLA	Buy	219.51	100	21,951.00		79,116.29	
10/25	TSLA	Sell	219.74	100	21,974.00	23.00	101,090.29	47.00
10/26	TSLA	Buy	228.80	100	22,880.00		78,210.29	
10/26	TSLA	Sell	228.99	100	22,899.00	19.00	101,109.29	66.00
10/26	TSLA	Buy	228.85	100	22,885.00		78,224.29	
10/26	TSLA	Sell	229.02	100	22,902.00	17.00	101,126.29	83.00
10/26	TSLA	Buy	229.08	100	22,908.00		78,218.29	
10/26	TSLA	Sell	229.34	100	22,934.00	26.00	101,152.29	109.00
10/26	TSLA	Buy	229.10	100	22,910.00		78,242.29	
10/26	TSLA	Sell	229.22	100	22,922.00	12.00	101,164.29	121.00
10/28	TSLA	Buy	222.65	100	22,565.00		78,599.29	
10/28	TSLA	Sell	225.80	100	22,580.00	15.00	101,179.29	136.00
10/28	TSLA	Buy	222.52	100	22,552.00		78,627.29	
10/28	TSLA	Sell	225.01	100	22,501.00	(51.00)	101,128.29	85.00
10/28	TSLA	Buy	225.19	100	22,519.00		78,609.29	
10/28	TSLA	Sell	225.36	100	22,536.00	17.00	101,145.29	102.00
10/28	TSLA	Buy	225.46	100	22,546.00		78,599.29	
10/28	TSLA	Sell	225.39	100	22,539.00	(7.00)	101,138.29	95.00

4.1.5 Week Five (Nvidia second trial), October 31st – November 6th, 2022

On the fourth week we traded Nvidia for the second time in our ten-week trading process. We bought and sold a hundred units four times a day for 3 days during the week. This week's profit was on the lower side, but it was still a successful week resulting in a total profit of \$71.00 US dollars. The amount of total cash that we will have to spend on week six will be \$101,209.29 US dollars. (See table 4.1.5.1 below for details)

Table 4.1.5.1 Scalp trading record week 5 (Nvidia second trial)

Date	Symbol	Buy/Sell	Price	Share	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
11/1							101,138.29	
11/2	NVDA	Buy	137.77	100	13,777.00		87,361.29	
11/2	NVDA	Sell	137.82	100	13,782.00	5.00	101,143.29	5.00
11/2	NVDA	Buy	137.79	100	13,779.00		87,364.29	
11/2	NVDA	Sell	137.76	100	13,776.00	(3.00)	101,140.29	2.00
11/2	NVDA	Buy	137.77	100	13,777.00		87,363.29	
11/2	NVDA	Sell	137.84	100	13,784.00	7.00	101,147.29	9.00
11/2	NVDA	Buy	137.88	100	13,788.00		87,359.29	
11/2	NVDA	Sell	137.90	100	13,790.00	2.00	101,149.29	11.00
11/3	NVDA	Buy	135.37	100	13,537.00		87,612.29	
11/3	NVDA	Sell	135.55	100	13,555.00	18.00	101,167.29	29.00
11/3	NVDA	Buy	135.39	100	13,539.00		87,628.29	
11/3	NVDA	Sell	135.44	100	13,544.00	5.00	101,172.29	34.00
11/3	NVDA	Buy	135.42	100	13,542.00		87,630.29	
11/3	NVDA	Sell	135.45	100	13,545.00	3.00	101,175.29	37.00
11/3	NVDA	Buy	135.48	100	13,548.00		87,627.29	
11/3	NVDA	Sell	135.65	100	13,565.00	17.00	101,192.29	54.00
11/4	NVDA	Buy	140.81	100	14,081.00		87,111.29	
11/4	NVDA	Sell	140.87	100	14,087.00	6.00	101,198.29	60.00
11/4	NVDA	Buy	140.70	100	14,070.00		87,128.29	
11/4	NVDA	Sell	140.89	100	14,089.00	19.00	101,217.29	79.00
11/4	NVDA	Buy	140.40	100	14,040.00		87,177.29	
11/4	NVDA	Sell	140.46	100	14,046.00	6.00	101,223.29	85.00
11/4	NVDA	Buy	140.42	100	14,042.00		87,181.29	
11/4	NVDA	Sell	140.28	100	14,028.00	(14.00)	101,209.29	71.00

4.1.6 Week Six (Apple second trial), November 7th – 13th, 2022

On this week we performed the second trial of apple, trading 100 units 4 times a day for 3 days. This week was successful with a total profit of \$91.00 US dollars. We will go into week seven with a total cash of \$101,300.29 US dollars. See table 4.1.6.1 below for more details.

Table 4.1.6.1 Scalp trading record week 6 (Apple second trial)

Date	Symbol	Buy/Sell	Price	Share	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
11/6							101,209.29	
11/7	APPL	Buy	137.62	100	13,762.00		87,447.29	
11/7	APPL	Sell	137.67	100	13,767.00	5.00	101,214.29	5.00
11/7	APPL	Buy	137.61	100	13,761.00		87,453.29	
11/7	APPL	Sell	137.70	100	13,770.00	9.00	101,223.29	14.00
11/7	APPL	Buy	137.71	100	13,771.00		87,452.29	
11/7	APPL	Sell	137.68	100	13,768.00	(3.00)	101,220.29	11.00
11/7	APPL	Buy	137.65	100	13,765.00		87,455.29	
11/7	APPL	Sell	137.58	100	13,758.00	(7.00)	101,213.29	4.00
11/8	APPL	Buy	139.27	100	13,927.00		87,286.29	
11/8	APPL	Sell	139.34	100	13,934.00	7.00	101,220.29	11.00
11/8	APPL	Buy	139.33	100	13,933.00		87,287.29	
11/8	APPL	Sell	139.48	100	13,948.00	15.00	101,235.29	26.00
11/8	APPL	Buy	139.33	100	13,933.00		87,302.29	
11/8	APPL	Sell	139.43	100	13,943.00	10.00	101,245.29	36.00
11/8	APPL	Buy	138.85	100	13,885.00		87,360.29	
11/8	APPL	Sell	138.91	100	13,891.00	6.00	101,251.29	42.00
11/9	APPL	Buy	137.18	100	13,718.00		87,533.29	
11/9	APPL	Sell	137.29	100	13,729.00	11.00	101,262.29	53.00
11/9	APPL	Buy	137.02	100	13,702.00		87,560.29	
11/9	APPL	Sell	137.24	100	13,724.00	22.00	101,284.29	75.00
11/9	APPL	Buy	137.19	100	13,719.00		87,565.29	
11/9	APPL	Sell	137.26	100	13,726.00	7.00	101,291.29	82.00
11/9	APPL	Buy	137.27	100	13,727.00		87,564.29	
11/9	APPL	Sell	137.36	100	13,736.00	9.00	101,300.29	91.00

4.1.7 Week Seven (Microsoft second trial), November 14th – 20th, 2022

For week seven we traded Microsoft units for the second time in our ten-week trial. We traded 100 units four times a day for three days. This week was somewhat successful with a resulting total profit of \$141.00 US dollars. We will go into week eight with a total cash of \$101,441.29 US dollars. See more details below (Table 4.1.7.1)

Table 4.1.7.1 Scalp trading record week 7 (Microsoft second trial)

Date	Symbol	Buy/ Sell	Price	Share	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
11/13							101,300.29	
11/14	MSFT	Buy	241.60	100	24,160.00		77,140.29	
11/14	MSFT	Sell	241.75	100	24,175.00	15.00	101,315.29	15.00
11/14	MSFT	Buy	241.78	100	24,178.00		77,137.29	
11/14	MSFT	Sell	241.88	100	24,188.00	10.00	101,325.29	25.00
11/14	MSFT	Buy	241.76	100	24,176.00		77,149.29	
11/14	MSFT	Sell	241.67	100	24,167.00	(9.00)	101,316.29	16.00
11/14	MSFT	Buy	241.59	100	24,159.00		77,157.29	
11/14	MSFT	Sell	241.64	100	24,164.00	5.00	101,321.29	21.00
11/15	MSFT	Buy	244.67	100	24,467.00		76,854.29	
11/15	MSFT	Sell	244.75	100	24,475.00	8.00	101,329.29	29.00
11/15	MSFT	Buy	244.70	100	24,470.00		76,859.29	
11/15	MSFT	Sell	244.77	100	24,477.00	7.00	101,336.29	36.00
11/15	MSFT	Buy	244.62	100	24,462.00		76,874.29	
11/15	MSFT	Sell	244.79	100	24,479.00	17.00	101,353.29	53.00
11/15	MSFT	Buy	244.74	100	24,474.00		76,879.29	
11/15	MSFT	Sell	244.82	100	24,482.00	8.00	101,361.29	61.00
11/16	MSFT	Buy	242.46	100	24,246.00		77,115.29	
11/16	MSFT	Sell	242.92	100	24,292.00	46.00	101,407.29	107.00
11/16	MSFT	Buy	242.88	100	24,288.00		77,119.29	
11/16	MSFT	Sell	242.96	100	24,296.00	8.00	101,415.29	115.00
11/16	MSFT	Buy	242.77	100	24,277.00		77,138.29	
11/16	MSFT	Sell	242.91	100	24,291.00	14.00	101,429.29	129.00
11/16	MSFT	Buy	242.40	100	24,240.00		77,189.29	
11/16	MSFT	Sell	242.52	100	24,252.00	12.00	101,441.29	141.00

4.1.8 Week Eight (Tesla second trial), November 21st – 27th, 2022

For week eight we traded Tesla for the second time in our ten-week trading program. We traded 100 units 4 times a day 3 times a week. This week was successful with a resultant total profit of \$177.00 US dollars. We will go into week nine with a total cash of \$101,618.29 US dollars. See Table 4.1.8.1 below for more details.

Table 4.1.8.1 Scalp trading record week 8 (Tesla second trial)

Date	Symbol	Buy/Sell	Price	Share	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
11/21							101,441.29	
11/22	TSLA	Buy	169.62	100	16,962.00		84,479.29	
11/22	TSLA	Sell	169.78	100	16,978.00	16.00	101,457.29	16.00
11/22	TSLA	Buy	169.70	100	16,970.00		84,487.29	
11/22	TSLA	Sell	169.95	100	16,995.00	25.00	101,482.29	41.00
11/22	TSLA	Buy	169.84	100	16,984.00		84,498.29	
11/22	TSLA	Sell	169.99	100	16,999.00	15.00	101,497.29	56.00
11/22	TSLA	Buy	169.91	100	16,991.00		84,506.29	
11/22	TSLA	Sell	170.01	100	17,001.00	10.00	101,507.29	66.00
11/23	TSLA	Buy	181.12	100	18,112.00		83,395.29	
11/23	TSLA	Sell	181.14	100	18,114.00	2.00	101,509.29	68.00
11/23	TSLA	Buy	181.00	100	18,100.00		83,409.29	
11/23	TSLA	Sell	181.09	100	18,109.00	9.00	101,518.29	77.00
11/23	TSLA	Buy	181.08	100	18,108.00		83,410.29	
11/23	TSLA	Sell	181.06	100	18,106.00	(2.00)	101,516.29	75.00
11/23	TSLA	Buy	181.10	100	18,110.00		83,406.29	
11/23	TSLA	Sell	181.16	100	18,116.00	6.00	101,522	81.002
11/24	TSLA	Buy	181.50	100	18,150.00		83,372.29	
11/24	TSLA	Sell	181.45	100	18,145.00	(5.00)	101,517.29	76.00
11/24	TSLA	Buy	180.89	100	18,089.00		83,428.29	
11/24	TSLA	Sell	181.34	100	18,134.00	45.00	101,562.29	121.00
11/24	TSLA	Buy	180.96	100	18,096.00		83,466.29	
11/24	TSLA	Sell	181.62	100	18,162.00	66.00	101,628.29	187.00
11/24	TSLA	Buy	181.71	100	18,171.00		83,457.29	
11/24	TSLA	Sell	181.61	100	18,161.00	(10.00)	101,618.29	177.00

4.1.9 Week Nine (Mixed scalp trading first trial), November 28th – December 4th, 2022

For week nine we did the first mixed trading week. In this week we traded a 100 Nvidia and Apple stocks 6 times a day once a week (each company on different days). This was a successful week with a total profit of \$96.00 US dollars. We will go into the last week with a total cash amount of \$101,716.29 US dollars. See Table 4.1.9.1 below for more details.

Table 4.1.9.1 Scalp trading record week 9 (Mixed scalp trading first trial)

Date	Symbol	Buy/ Sell	Price	Share	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/27							101,618.29	
10/28	NVDA	Buy	160.12	100	16,012.00		85,606.29	
10/28	NVDA	Sell	160.27	100	16,027.00	15.00	101,633.29	15.00
10/28	NVDA	Buy	160.17	100	16,017.00		85,616.29	
10/28	NVDA	Sell	160.37	100	16,037.00	20.00	101,653.29	35.00
10/28	NVDA	Buy	160.28	100	16,028.00		85,625.29	
10/28	NVDA	Sell	160.35	100	16,035.00	7.00	101,660.29	42.00
10/28	NVDA	Buy	160.26	100	16,026.00		85,634.29	
10/28	NVDA	Sell	160.31	100	16,031.00	5.00	101,665.29	47.00
10/28	NVDA	Buy	160.25	100	16,025.00		85,640.29	
10/28	NVDA	Sell	160.37	100	16,037.00	12.00	101,677.29	59.00
10/28	NVDA	Buy	160.30	100	16,030.00		85,647.29	
10/28	NVDA	Sell	160.38	100	16,038.00	8.00	101,685.29	67.00
10/29	AAPL	Buy	144.26	100	14,426.00		87,259.29	
10/29	AAPL	Sell	144.28	100	14,428.00	2.00	101,687.29	69.00
10/29	AAPL	Buy	144.23	100	14,423.00		87,264.29	
10/29	AAPL	Sell	144.29	100	14,429.00	6.00	101,693.29	75.00
10/29	AAPL	Buy	144.27	100	14,427.00		87,266.29	
10/29	AAPL	Sell	144.31	100	14,431.00	4.00	101,697.29	79.00
10/29	AAPL	Buy	144.29	100	14,429.00		87,268.29	
10/29	AAPL	Sell	144.35	100	14,435.00	6.00	101,703.29	85.00
10/29	AAPL	Buy	144.34	100	14,434.00		87,269.29	
10/29	AAPL	Sell	144.45	100	14,445.00	11.00	101,714.29	96.00
10/29	AAPL	Buy	144.42	100	14,442.00		87,272.29	
10/29	AAPL	Sell	144.44	100	14,444.00	2.00	101,716.29	98.00

4.1.10 Week Ten (Mixed scalp trading second trial), December 5th – 11th, 2022

For week ten we performed the second mixed trading section. This week we traded Microsoft and Tesla stocks. A total of 100 units were traded of 6 times in a day for each company. The total profit of this week was \$43.00 US dollars. We will close the scalping trading trial with \$101,759.29 US dollars.

Table 4.1.10.1 Scalp trading record week 10 (Mixed scalp trading second trial)

Date	Symbol	Buy/ Sell	Price	Share	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
12/4							101,716.29	
12/5	MSFT	Buy	251.41	100	25,141.00		76,575.29	
12/5	MSFT	Sell	251.50	100	25,150.00	9.00	101,725.29	9.00
12/5	MSFT	Buy	251.40	100	25,140.00		76,585.29	
12/5	MSFT	Sell	251.37	100	25,137.00	(3.00)	101,722.29	6.00
12/5	MSFT	Buy	251.26	100	25,126.00		76,596.29	
12/5	MSFT	Sell	251.30	100	25,130.00	4.00	101,726.29	10.00
12/5	MSFT	Buy	251.25	100	25,125.00		76,601.29	
12/5	MSFT	Sell	251.32	100	25,132.00	7.00	101,733.29	17.00
12/5	MSFT	Buy	251.30	100	25,130.00		76,603.29	
12/5	MSFT	Sell	251.39	100	25,139.00	9.00	101,742.29	26.00
12/5	MSFT	Buy	251.32	100	25,132.00		76,610.29	
12/5	MSFT	Sell	251.30	100	25,130.00	(2.00)	101,740.29	24.00
12/6	TSLA	Buy	176.38	100	17,638.00		84,102.29	
12/6	TSLA	Sell	176.39	100	17,639.00	1.00	101,741.29	25.00
12/6	TSLA	Buy	176.27	100	17,627.00		84,114.29	
12/6	TSLA	Sell	176.32	100	17,632.00	5.00	101,746.29	30.00
12/6	TSLA	Buy	176.28	100	17,628.00		84,118.29	
12/6	TSLA	Sell	176.39	100	17,639.00	11.00	101,757.29	41.00
12/6	TSLA	Buy	176.32	100	17,632.00		84,125.29	
12/6	TSLA	Sell	176.28	100	17,628.00	(4.00)	101,753.29	37.00
12/6	TSLA	Buy	176.20	100	17,620.00		84,133.29	
12/6	TSLA	Sell	176.24	100	17,624.00	4.00	101,757.29	41.00
12/6	TSLA	Buy	176.06	100	17,606.00		84,151.29	
12/6	TSLA	Sell	176.08	100	17,608.00	2.00	101,759.29	43.00

4.2 Results

In this section, we will discuss the results of Scalp Trading. After the 10 weeks of trading, we can say that this method of trading was a successful obtaining a total profit of \$1,759.29 US dollars in a total of a hundred and twenty trades in the span of ten weeks (See more on tables 4.2.1 and 4.2.2 below). This means a total increase of 1.76%.

Table 4.2.1 Scalp trading profit per week in US dollars (Weeks 1-5)

Week	1	2	3	4	5
Profit	375.18	467.11	201.00	95.00	71.00

Table 4.2.2 Scalp trading profit per week in US dollars (Weeks 6-10)

Week	6	7	8	9	10
Profit	91.00	141.00	177.00	98.00	43.00

To breakdown our 10-week trial which started on October and ended in December we have some figures with important information. On figure 4.2.3 (below) we discuss the weekly net profit in our 10-week trial. The peak of this chart is week 2 with a total of \$467.11 US dollars therefore being the most successful week. On the contrary, week 10 was the least successful one with a total profit of \$43.00 US dollars.

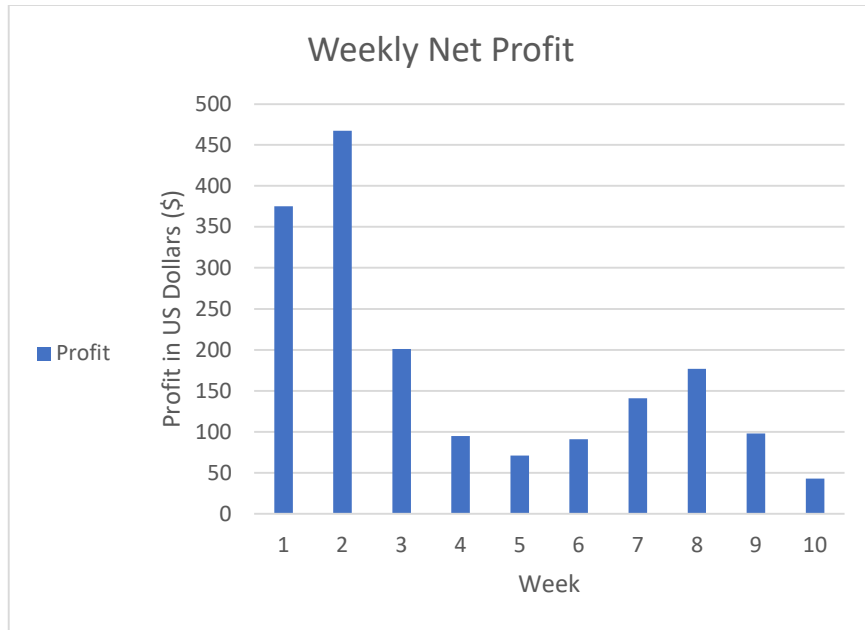


Figure 4.2.3 Scalp trading weekly net profit chart in US dollars

In table 4.2.4 (see below), we discuss the cumulative profit throughout the weeks, in other words, the amount of money that we had over or under our starting cash which was \$100,000 US dollars. In this chart, week ten is the peak reaching \$1,759.29 US dollars. In our case, we didn't have any negative weeks which explains or positive slope on our figure. On figure 4.2.5 (below) we have the end of week cash by individual week.

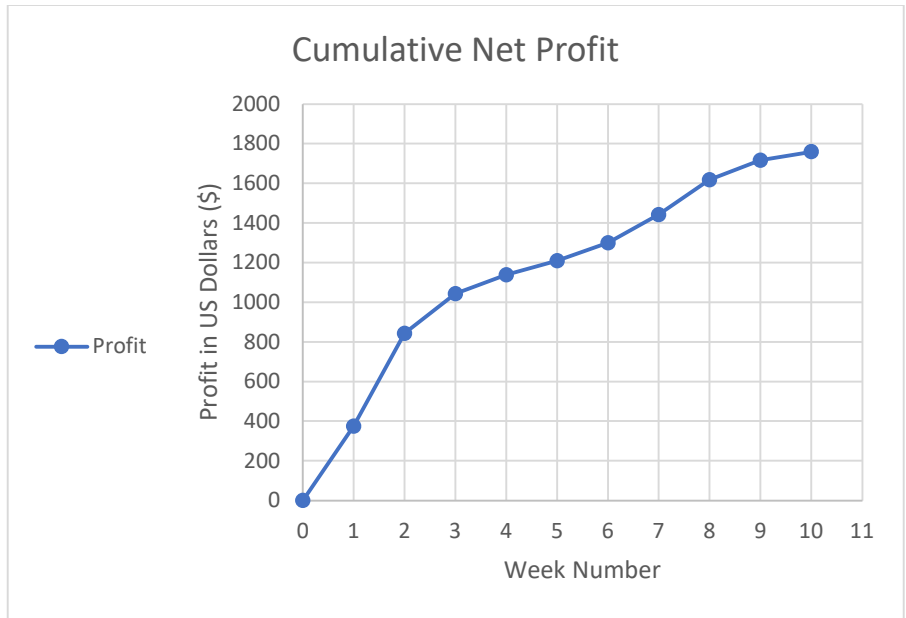


Figure 4.2.4 Scalp trading cumulative net profit chart in US dollars

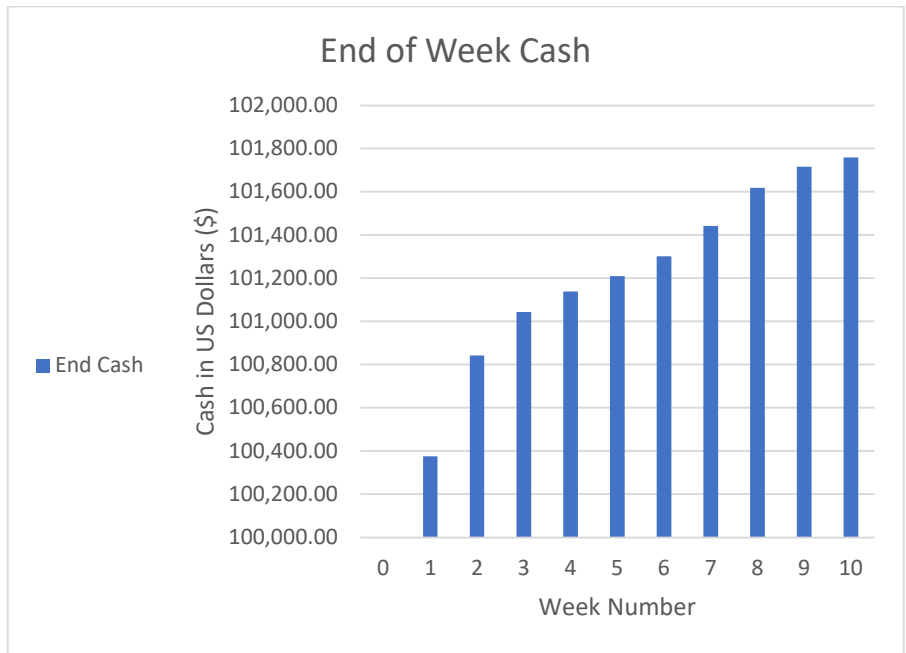
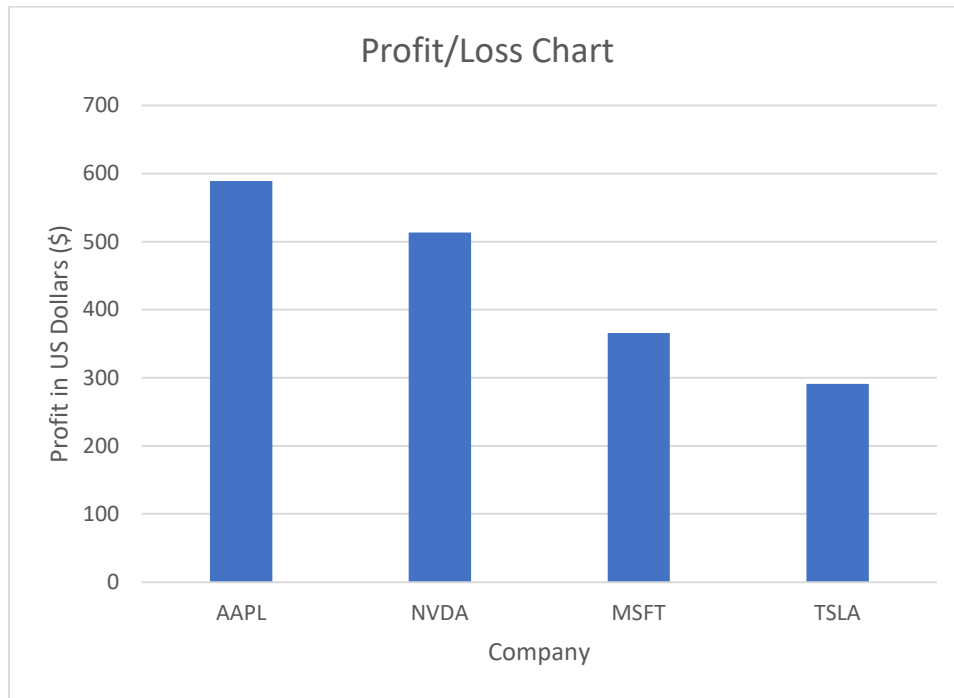


Figure 4.2.5 Scalp trading end of week cash chart in US dollars

In the span of October until December, Apple was the most successful company bringing a total profit of \$589.11 US Dollars and Tesla was the least successful with a total profit of \$291.00 US Dollars (as shown in figure 4.2.6 below).



[Figure 4.2.6 Scalp trading profit/loss chart by company](#)

4.3 Conclusion

In this segment of the project, we realized Scalp Trading. This style of trading has been one of the most famous ones in the last couple of years and it consist of profiting from minor price changes in the price of a stock by buying a stock, holding it for a few seconds and then selling it as soon as the price gets higher than the buying price. Successful traders that use this method use technical analysis like MACD or candlestick charts and trending charts. These people normally buy and sell a decent quantity of units at a time and trade multiple times a day. We did a total of twelve trades a week during a 10-week trial.

As a group, we used these methods and techniques to ensure a better approach to this method of trading. We traded from four companies from the information technology sector. These companies were Apple (AAPL), Tesla (TSLA), Nvidia (NVDA) and Microsoft (MSFT). The total profit per company is shown in the table 4.2.7 below:

Table 4.2.7 Scalp trading company total profit chart in US dollars

COMPANY	TOTAL PROFIT
Nvidia Corp. (NVDA)	513.18
Apple Inc. (AAPL)	589.11
Microsoft Corp. (MSFT)	366.00
Tesla Inc. (TSLA)	291.00

With the table above we can see that the most successful company was Apple Inc bringing the highest profit. On the contrary, Tesla Inc was the least successful company in the trial bringing the lowest profile amongst the companies.

In conclusion, we can say that scalp trading is a decent method to profit. In our opinion is a method that require work and high effort level which may not suit some people. In addition, the use of charts and trends is also useful for a successful scalping process. Scalp is a method that we will implement in our stock process and apply it in real life.

Chapter 5. Dollar Cost Averaging

5.1 Simulation

In this simulation, we will utilize dollar-cost averaging as our investment strategy. We will start with \$100,000 and supply our portfolio of Apple, Tesla, NVidia, and Microsoft with smaller weekly investments until the end of the simulation. We will purchase equal dollar amounts into the four stocks every week. With share prices varying, we inevitably will have different quantities of shares between each company. However, the dollar amount within each investment will be constant. In the first week of the simulation, we will invest \$10,000 split into the four stocks. Each company receives roughly \$2500 weekly until a total of \$100,000 is invested.

5.1.1 Week One: October 3rd – 7th, 2022

Over the week of October 3rd, 2022, the market was slightly in decline as seen in Table 5.1.1.1. The graph shows that all companies except for Apple had a net loss on closing day on Oct 7th shown in Figure 5.1.1.2. Market gains earlier in the week were enough to outpace declines later, as stocks enjoyed their best weekly gains in a month. The Russell 2000, the Dow, and the Global Dow paced the benchmark indexes listed here. The S&P 500 climbed higher, while the Nasdaq was able to hold on to a marginal gain. However, stocks ended the week sharply on Friday. With the Nasdaq (-3.8%) and the Russell 2000 (-2.9%) falling the furthest. The S&P 500 slid 2.8%, the Dow declined 2.1%, and the Global Dow dropped 1.9%. See Table 5.1.1.1 below for more details.

Table 5.1.1.1 Dollar-cost averaging week 1

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Oct 3, 2022							\$100,000	
Oct 3, 2022	AAPL	Buy	\$139.03	18	\$2,502.54	0.76%	\$97,497	\$20.22
Oct 3, 2022	TSLA	Buy	\$246.23	9	\$2,216.07	0.34%	\$95,281	\$7.53
Oct 3, 2022	NVDA	Buy	\$122.44	20	\$2,448.80	0.01%	\$92,833	\$0.03
Oct 3, 2022	MSFT	Buy	\$235.03	11	\$2,585.33	9.40%	\$90,247	\$243.02
Oct 7, 2022							\$90,247	\$99,769

Tesla had a rough week as shares plummeted with the news for the company and its chief, Elon Musk. Over the weekend, Tesla reported electric vehicle production and delivery numbers that did not meet analysts' expectations. After that, Musk posted a Twitter poll on the Russia-Ukraine war that aroused controversy and announced he would follow through on the acquisition of Twitter, which he'd been trying to get out of for months. Microsoft declined 7.7% after the tech giant reported weaker-than-expected cloud revenue in its latest quarterly results, despite beating earnings and revenue estimates. The company also issued current-quarter revenue guidance that fell short of expectations. Shares of Apple traded lower on Wednesday after reports that the company intends to backtrack on plans to ramp up iPhone production this year. According to a Bloomberg story citing people familiar with the matter, today its sales outlook rose ahead of the iPhone 14 launch and some of the company's suppliers had started bracing for a 7% increase in orders. PC-market weakness has some investors worried about Nvidia stock. However, Nvidia's next-generation GPU should be a major revenue generator for the company. The chip-market selloff could raise NVDA stock. See Figure 5.1.1.2 below for more details.

Company Performances Over Week One

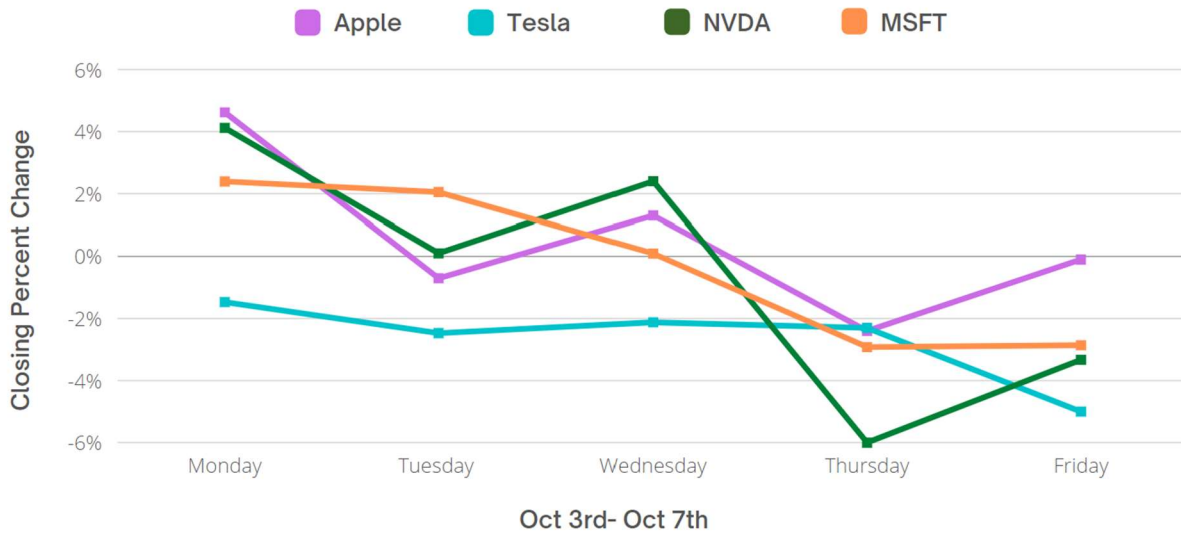


Figure 5.1.1.2 Dollar-cost averaging profit/ loss chart of week 1

5.1.2 Week Two: October 10th – 14th, 2022

Somewhat of an uneventful week in the market. The week of October 10th showed a slight drop-off in the market, which includes all four tech companies. Table 5.1.2.1 shows an average loss of 1% between MSFT, TSLA, AAPL, and NVDA. Shares of Microsoft (MSFT) slid 2.42% to \$228.56 Friday, on what proved to be an all-around rough trading session for the stock market, with the S&P 500 Index falling 2.37% to 3,583.07 and Dow Jones Industrial Average falling 1.34% to 29,634.83. The stock's fall snapped a two-day winning streak. Microsoft closed \$121.11 short of its 52-week high (\$349.67), which the company achieved on November 22nd.

Shares of Tesla (TSLA) were initially trading higher at the market open on Friday before market traders turned their attention back to the economy, which sent most stocks down today. As of 12:42 p.m. ET, the stock was trading down 5.4%, while the Nasdaq Composite was down 2.3%. The sell-off comes after another analyst issued a positive note on Tesla ahead of next week's third-quarter earnings report. Wells Fargo believes Tesla will beat third-quarter estimates, with

favorable pricing offsetting currency headwinds from a strong U.S. dollar. Most importantly, the analyst expects Tesla to capitalize on the electric vehicle incentives built into the Inflation Reduction Act. Assuming Tesla maxes out its U.S. capacity, it could save \$2.8 billion. See Table 5.1.2.1 below for more details.

Table 5.1.2.1 Dollar-cost averaging week 2

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Oct 10, 2022							\$90,247	
Oct 10, 2022	AAPL	Buy	\$139.11	18	\$2,503.98	0.19%	\$87,743	\$9.54
Oct 10, 2022	TSLA	Buy	\$218.66	11	\$2,405.26	1.78%	\$85,338	\$89.50
Oct 10, 2022	NVDA	Buy	\$118.67	21	\$2,492.07	1.07%	\$82,845	\$53.44
Oct 10, 2022	MSFT	Buy	\$232.25	11	\$2,554.75	0.93%	\$80,291	\$46.33
Oct 14, 2022							\$80,291	\$99,568.92

Nvidia stock (NVDA) dropped more than 8% on Friday last week after competitor chipmaker Advanced Micro Devices (AMD) reported preliminary sales for the third quarter of 2022. Following its recent fall, Nvidia stock (NVDA) is priced at 39 times trailing earnings. While this is lower than the company's five-year average earnings multiple of 58, it is still higher than the Nasdaq 100's price-to-earnings ratio of 24. The steep decline sets up the big tech industries to have strong start the following week. Seen in Figure 5.1.2.2 it's common to see pull back after a day of big gains. And in the next week shown in Figure 5.1.3.2, all 4 stocks made a healthy recovery after the red day on Oct 14th. The tech industry has been hit hard in 2022, with multiple companies' stocks experiencing significant declines. Apple's share price has been affected by a downturn in consumer demand. However, its share price continues to retain more value than many other tech stocks. See Figure 5.1.2.2 below for more details.

Company Performances Over Week Two

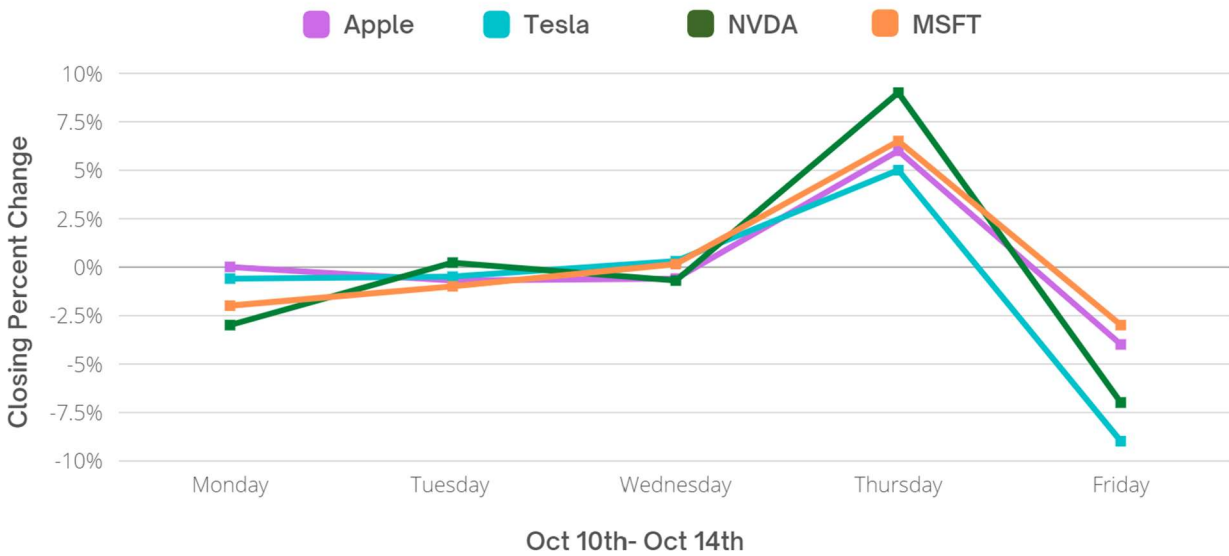


Figure 5.1.2.2 Dollar-cost averaging profit/ loss chart of week 2

5.1.3 Week Three: October 17th – 21st, 2022

A scotching high for the week of October 17th, 2022. Closing near earning callouts and finical reports has given many tech companies a light of hope, as seen in Table 5.1.3.1. Tesla, with all the surrounding news with Elon Musk, has been able to keep up with the rest of the tech companies. Tesla's net income for Q3 2022 reached \$3.33 billion, with automotive gross margins holding steady at 27.9%, exactly where it stood in the second quarter of 2022. During the same period last year, Tesla reported \$1.62 billion in profits. Tesla's net income for Q3 2022 reached \$3.33 billion, with automotive gross margins holding steady at 27.9%, exactly where it stood in the second quarter of 2022. During the same period last year, Tesla reported \$1.62 billion in profits. See Table 5.1.3.1 below for more details.

Table 5.1.3.1 Dollar-cost averaging week 3

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Oct 17, 2022							\$80,291	
Oct 17, 2022	AAPL	Buy	\$139.11	18	\$2,503.9 8	6.34%	\$77,787.22	\$475.67
Oct 17, 2022	TSLA	Buy	\$214.37	12	\$2,572.4 4	4.07%	\$75,214.78	\$305.25
Oct 17, 2022	NVDA	Buy	\$117.52	21	\$2,467.9 2	10.20%	\$72,746.86	\$763.22
Oct 17, 2022	MSFT	Buy	\$238.38	11	\$2,622.1 8	3.01 %	\$70,124.68	\$225.75
Oct 21, 2022							70,124.68	\$101,263.05

Apple has a very busy week planned, including the launch of the 10th-generation iPad 16.1, and macOS Ventura with the highly anticipated Stage Manager feature. And then there are the products that are still coming. Apple has a very busy week planned, including the launch of the 10th-generation iPad 16.1, and macOS Ventura with the highly anticipated Stage Manager feature. And then there are the products that are still coming. Week to date, shares of Nvidia (NVDA) were up 7% as of 11:20 a.m. ET on Friday. Nvidia's return outperformed the Nasdaq return of 2.6% over the last week. A new partnership with Oracle gave Nvidia a much-needed boost. The stock has fallen 58% year to date over concerns about weakening demand across the semiconductor industry. See Figure 5.1.3.2 below for more details.

Company Performances Over Week Two

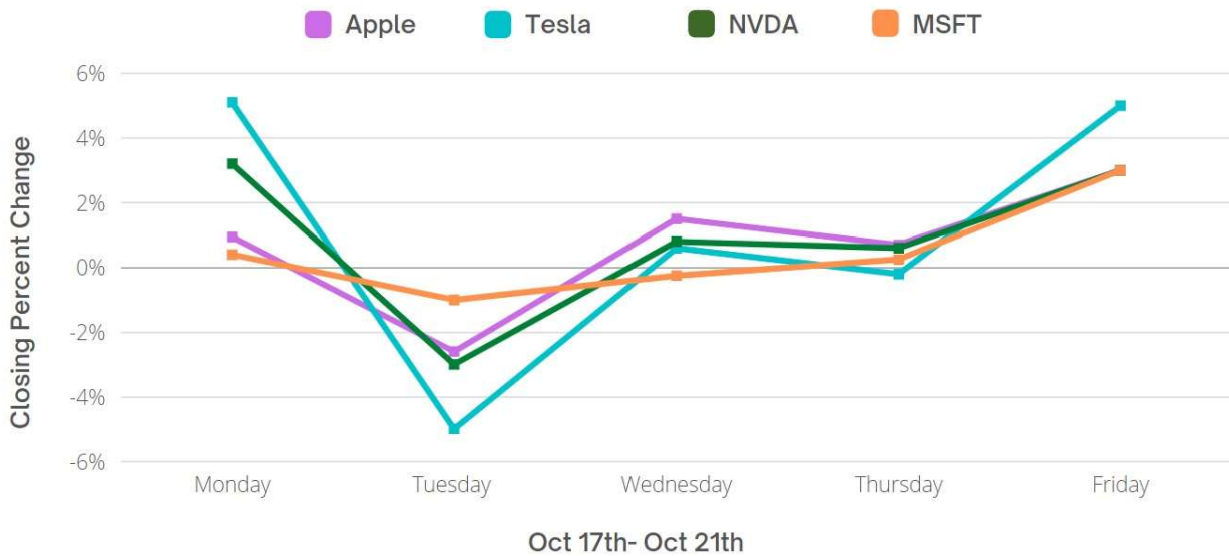


Figure 5.1.3.2 Dollar-cost averaging profit/ loss chart of week 3

Microsoft's MSFT Q1 fiscal 2023 earnings release on October 25 will be one of the most watched during a busy week full of big tech reports. The software titan is one of the premier tech stocks due to its diverse technology products, which include cloud services, server applications, business solutions, management tools, and video games. Trading 31% off its highs, it will be important to see if Microsoft was able to sustain growth in most of its business segments.

5.1.4 Week Four: October 24th – 28th, 2022

Tesla, in wealthy Singapore, where new vehicle registration is tightly controlled to manage the city state's traffic and pollution, Tesla is having a moment: surging sales are gobbling up rivals' market share shown in Figure 5.1.4.2. The buying frenzy in one of the world's most expensive places to own a vehicle. Tesla jumped 10% seen in Table 5.1.41. due to its basic Model 3 costs nearly S200,000 (\$148,300) in Singapore, primarily due to an ownership levy, compared with less

than \$40,000 in the United States - underscores the U.S. firm's ascent in the global auto industry.

See Table 5.1.4.1 below for more details.

Table 5.1.4.1 Dollar-cost averaging week 4

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Oct 24, 2022							\$70,125	
Oct 24, 2022	AAPL	Buy	\$148.01	17	\$2,516.17	4.90%	\$67,608.51	\$490.28
Oct 24, 2022	TSLA	Buy	\$206.91	12	\$2,482.92	10.20%	\$65,125.59	\$,1020.18
Oct 24, 2022	NVDA	Buy	\$125.08	20	\$2,501.60	7.50%	\$62,623.99	\$750.87
Oct 24, 2022	MSFT	Buy	\$246.30	10	\$2,463.00	5.10%	\$60,160.99	\$510.81
Oct 28, 2022							\$60,160.99	\$103.582.84

Apple, on Friday, October 28th announced financial results for its fiscal 2021 fourth quarter ended September 25, 2021. The Company posted a September quarter revenue record of \$83.4 billion, up 29 percent year over year, and quarterly earnings per diluted share of \$1.24. Apple's board of directors has declared a cash dividend of \$0.22 per share of the Company's common stock. The dividend is payable on November 11, 2021, to shareholders of record as of the close of business on November 8, 2021. See Figure 5.1.4.2 below for more details.

Company Performances Over Week Four

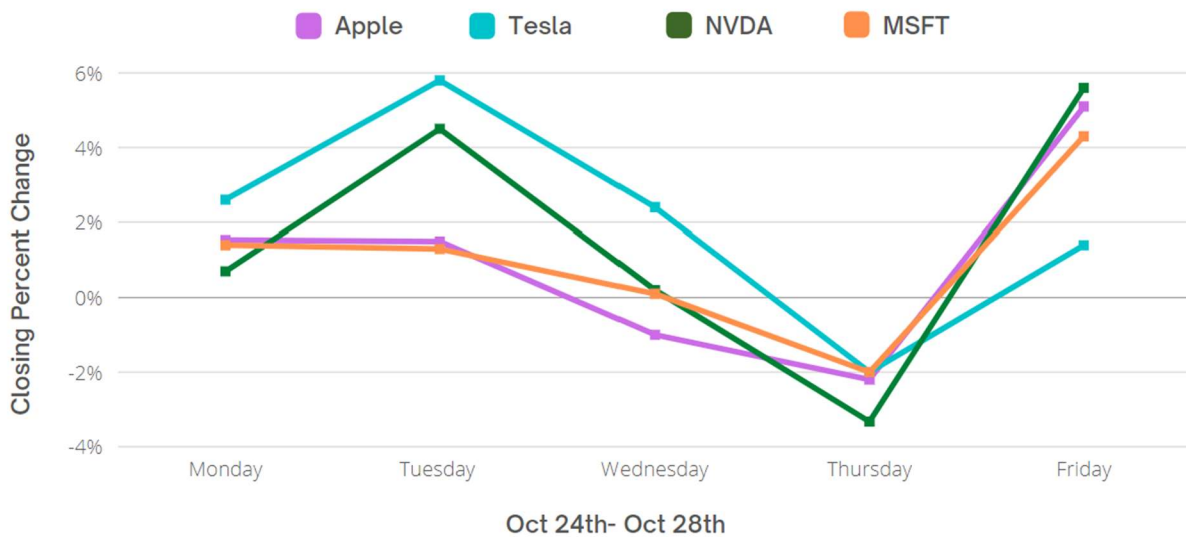


Figure 5.1.4.2 Dollar-cost averaging profit/ loss chart of week 4

This week, Tesla surpassed \$1 trillion in market value, overshadowing the combined value of five of its biggest rivals, Toyota Motor Corp, Volkswagen AG, Daimler AG, Ford Motor, and General Motors. Shares of Nvidia Corp. (NVDA) surged as much as 7% and finished up 2.2%, compared with a 1.5% drop on the PHLX Semiconductor Index and a 0.6% decline on the S&P 500 index.

5.1.5 Week Five October 31st – November 5th, 2022

After considerable positive gains in the last full week of October the tech market as whole tested its support with a brutal week Oct 31st Table 5.1.5.1. Microsoft Corporation (MSFT) has announced its dividend increase from last year's comparable payment on December 8 to \$0.68. This makes the dividend yield about the same as the industry average at 1.2%. According to Dow Jones Market Data, Apple's stock (AAPL) finished down 11.2% on the week, its worst weekly performance since the week that ended March 20, 2020. The stock declined 17.5% during that early-pandemic stretch. Which is why also shares of Apple fell during all five sessions this week. While Apple's stock has fared better than that of Alphabet and other Big Tech peers, the company

faces potential pandemic-related challenges owing to new COVID-19 setbacks at manufacturer Foxconn's central facility. See Table 5.1.5.1 below for more details.

Table 5.1.5.1 Dollar-cost averaging week 5

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Oct 31, 2022							\$60,161	
Oct 31, 2022	AAPL	Buy	\$152.64	17	\$2,594.88	-8.50%	\$57,566.11	\$1061.54
Oct 31, 2022	TSLA	Buy	\$223.11	11	\$2,454.21	-11.00%	\$55,111.90	\$1372.92
Oct 31, 2022	NVDA	Buy	\$135.30	18	\$2,435.40	-0.65%	\$52,676.50	\$81.25
Oct 31, 2022	MSFT	Buy	\$232.25	11	\$2,554.75	-8.10%	\$50,121.75	\$1019.32
Nov 5, 2022							\$50,121.75	\$99,961.50

Since Tesla CEO Elon Musk announced his bid to buy social network Twitter, shares in his electric vehicle maker have dipped by more than 35% and closed just 3.6% for the day on Friday, amid a market rally that followed a volatile week. Seen in Figure 5.1.5.2 Tesla made a short recovery after Wednesday evening into Thursday but pressure from Elon and his performance likely kept the company losing value this week. The Nasdaq Composite is down by about 18% over the same time frame. Musk first announced he had agreed to buy Twitter on April 25, 2022. Tesla shares closed that day at \$332.67 and closed today at \$207.47, capping his first week of Twitter ownership. Musk's challenge will be to juggle both highly invested companies. See Figure 5.1.5.2 below for more details.

Company Performances Over Week Five

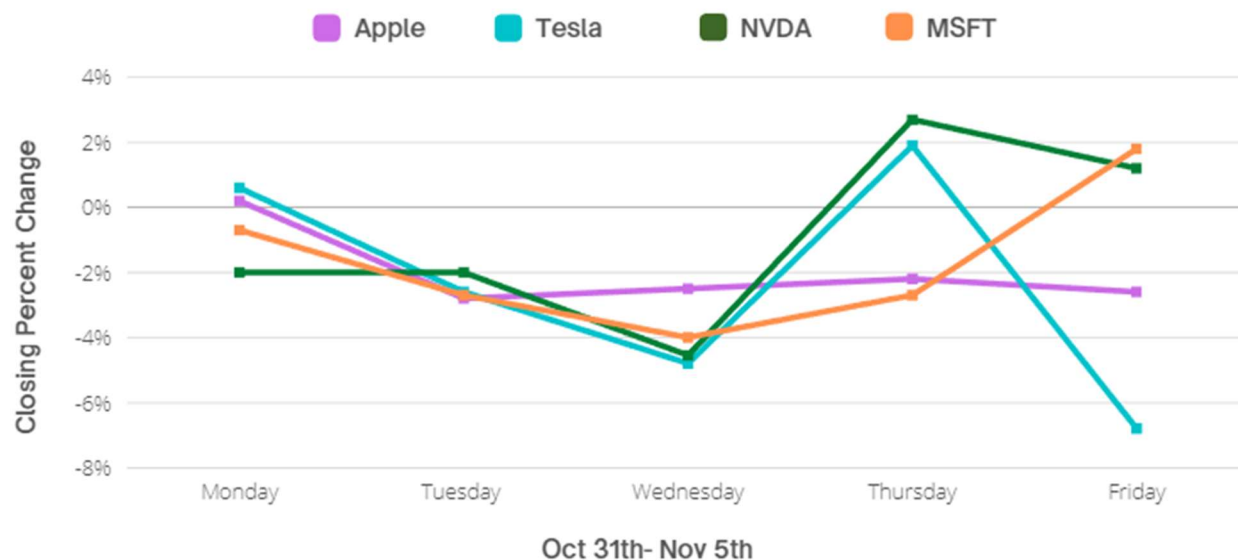


Figure 5.1.5.2 Dollar-cost averaging profit/ loss chart of week 5

5.1.6 Week Six: November 7th – November 11th, 2022

Tesla shares slid to their lowest level in nearly two years on Wednesday after Elon Musk disclosed, he sold another 3.95 billion shares. Shares ended 7.2% at \$177.59, the lowest level since November of 2020. Musk's latest share sale fueled jitters about the fallout of his \$44 billion Twitter buy. In Table 5.1.6.1 we see an 8% drop while the rest of the tech market rises, especially Nvidia testing resistance levels. The acquisition sparked investor concerns, including whether he would be distracted from running Tesla or divert resources to the social media company. The possible fear that Twitter could impact Tesla's sales and brand, as well as potential pressure on Tesla from countries trying to control online speech.

Microsoft stock is about to trade ex-dividend in four days. The company's upcoming dividend is US\$0.68 a share, following from the last 12 months when the company distributed a total of US\$2.72 per share to shareholders. Last year's total dividend payments show that Microsoft has a trailing yield of 1.1% on the current share price of \$242.98. Microsoft has been growing earnings

rapidly and has a relatively low payout ratio, implying that it is reinvesting heavily in its business, a sterling combination. See Table 5.1.6.1 below for more details.

Table 5.1.6.1 Dollar-cost averaging week 6

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Nov 7, 2022							\$50,122	
Nov 7, 2022	AAPL	Buy	\$136.18	18	\$2,451.24	4.60%	\$47,670.51	\$686.77
Nov 7, 2022	TSLA	Buy	\$202.71	12	\$2,432.52	8.5%	\$45,237.99	\$1277.87
Nov 7, 2022	NVDA	Buy	\$141.37	18	\$2,544.66	6.1%	\$42,693.33	\$915.77
Nov 7, 2022	MSFT	Buy	\$222.91	11	\$2,452.01	6.0%	\$40,241.32	\$896.19
Nov 11, 2022							\$40,241.32	\$102,288

Apple's shares are down year to date with a loss of 22%. Rising inflation and interest rates have hurt consumer spending and other parts of the economy, leading to a stock market sell-off. The Nasdaq index is also down 32% so far this year. While Apple stock has suffered, it has still fared far better than many of its technology peers. For instance, Alphabet and Microsoft have dipped by 39% and 32%, respectively. Apple is proving it's capable of successfully pushing through poor market conditions. However, after a rough and messy start to the week seen in Figure 5.1.6.2 all four tech giants finished the week off at around 2.2% gain.

Nvidia has been sorrowful and gained more than 20% in stock value over the past nine weeks. Holding firm in a regressive bear market. U.S. microchip manufacturer Nvidia has begun offering a new high-end chip to customers in China that is unaffected by U.S. export restrictions. The chip, known as the A800, is the first reported effort by a U.S. semiconductor company to create advanced chips for Chinese companies to avoid U.S. export rules. The Biden administration

announced new restrictions against the Chinese semiconductor industry in October 2022, severely curtailing Chinese firms' ability to buy advanced chips. Nvidia has previously said that the new export rules would jeopardize about \$400 million worth of chip sales to China per quarter and that this alternative chip could soften the impact of the restrictions. See Figure 5.1.6.2 below for more details.

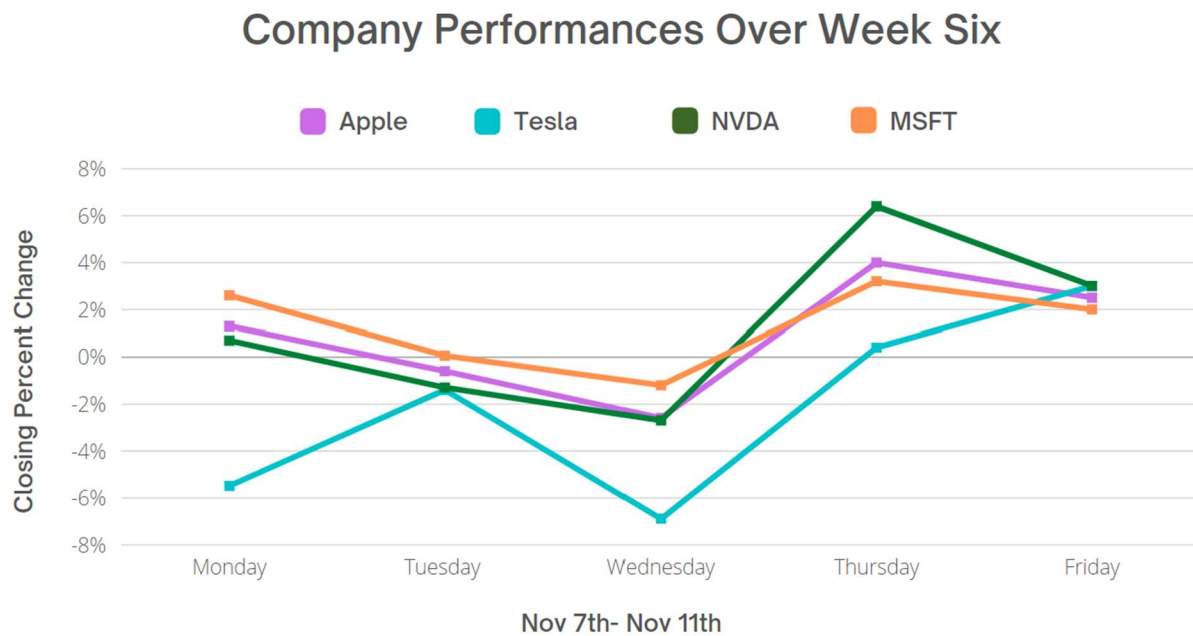


Figure 5.1.6.2 Dollar-cost averaging profit/ loss chart of week 6

5.1.7 Week Seven: November 14th – November 18th, 2022

The growth of Tesla may rise on Wednesday simply due to a rebound from last week's sharp sell-off. Tesla may also reflect the growing buzz on Wall Street for electric vehicles. Since electric vehicle maker Rivian Automotive (RIVN) went public last week, the electric vehicle market has received much attention. Shares of Rivian and Lucid Group (LCID) have soared, climbing 46% and 35%, respectively, over the past five trading days. Nvidia seen in Table 5.1.7.1 even in down

week not only for the tech market but for the general market, the company shows resiliency gaining over 20% over the past 2 months of trading.

With rising interest in electric vehicles on the Street, it's not surprising to see Tesla stock rebounding from a more than 15% decline last week. Shares pressured the previous week as Tesla CEO Elon Musk revealed a plan to unload 10% of his stake in the company to pay taxes.

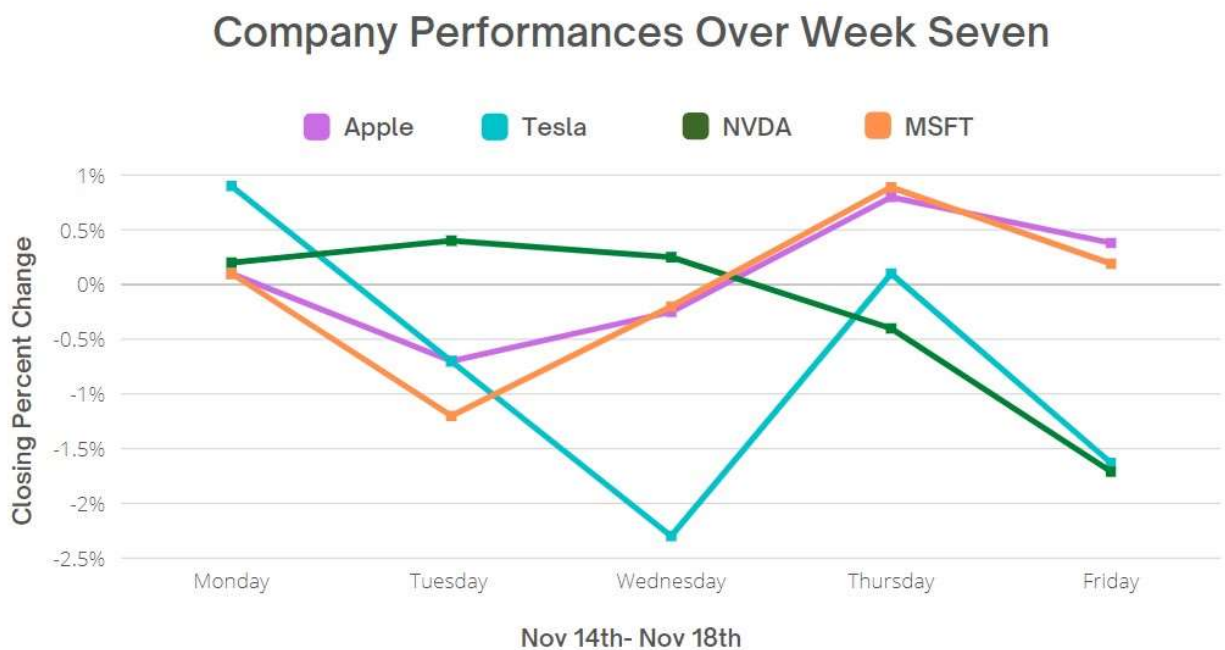
Nvidia expects to post adjusted earnings of 71 cents per share for Q3 this week and see revenue dropping 18% year-over-year amid reduced demand from cryptocurrency miners. Nvidia's data-center sales disappointed in Q2 but remain a key driver of growth for the chip developer. The new U.S. export restrictions on sales to China could cost Nvidia \$400 million in annual revenue. See Table 5.1.7.1 below for more details.

Table 5.1.7.1 Dollar-cost averaging week 7

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Nov 14, 2022							\$40,241	
Nov 14, 2022	AAPL	Buy	\$149.10	17	\$2,534.70	1.40%	\$37,706.62	\$259.65
Nov 14, 2022	TSLA	Buy	\$188.39	13	\$2,449.07	3.63%	\$35,257.55	\$628.77
Nov 14, 2022	NVDA	Buy	\$160.81	15	\$2,412.15	0.30%	\$32,845.40	\$67.43
Nov 14, 2022	MSFT	Buy	\$239.62	10	\$2,396.20	1.26%	\$30,449.20	\$215.07
Nov 18, 2022							\$30,449.20	\$101.107

As a leader in the PC industry, Microsoft's (MSFT -0.19%) stock has not been unscathed through the market declines. Its shares have fallen 28% since January, primarily brought down by macroeconomic headwinds. Microsoft is also dealing in 1.1% quarterly dividends.

Shares of Apple Inc. (AAPL) inched 0.38% higher to \$151.29 Friday, on what proved to be an all-around excellent trading session for the stock market, with the NASDAQ Composite Index rising 0.01% to 11,146.06 and the Dow Jones Industrial Average rising 0.59% to 33,745.69; Apple's second consecutive day of gains. Apple Inc. closed \$31.65 short of its 52-week high (\$182.94), which the company reached on January 4th. A rocky week with both up and downs Figure 5.1.7.2 ultimately average out with little to no gains or loses. See Figure 5.1.7.2 below for more details.



[Figure 5.1.7.2 Dollar-cost averaging profit/ loss chart of week 7](#)

5.1.8 Week Eight: November 21st – November 25th, 2022

Apple conceded some of its gains on Friday; however, a strong comeback week for apple. China's COVID-19 lockdowns are directly affecting the big iPhone factory in Zhengzhou. That factory makes the higher-end new iPhone models that were recently launched. This news coming out Friday could impact Apple next week. With all the bad news Apple however, rose 1.30% seen in Table 5.1.8.1.

Table 5.1.8.1 Dollar-cost averaging week 8

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Nov 21, 2022							\$30,449	
Nov 21, 2022	AAPL	Buy	\$147.82	17	\$2,512.94	1.30%	\$27,936	\$287.15
Nov 21, 2022	TSLA	Buy	\$167.30	15	\$2,509.50	2.10%	\$25,427	\$465.77
Nov 21, 2022	NVDA	Buy	\$152.95	16	\$2,447.20	7.00%	\$22,980	\$1367.39
Nov 21, 2022	MSFT	Buy	\$242.74	10	\$2,427.40	1.00%	\$20,552	\$142.69
Nov 25, 2022						Total Profit	\$20,552	\$103,617.95

With all the news surrounding Tesla you can see the growth difference between the other tech companies Figure 5.1.8.2. The Chinese market claimed Friday that Tesla recalled more than 80,000 electric cars in China over seatbelt and software issues. Elon Musk's automaker also recalls 2,736 imported Model 3 vehicles produced between Jan. 12, 2019, and Nov. 22, 2019, and 10,127 of the China-made versions of this car due to a potentially faulty seatbelt. Tesla will check the seatbelts on the affected vehicles. This could possibly cause a big blow to Tesla as a whole. See Figure 5.1.8.2 below for more details.

Company Performances Over Week Eight

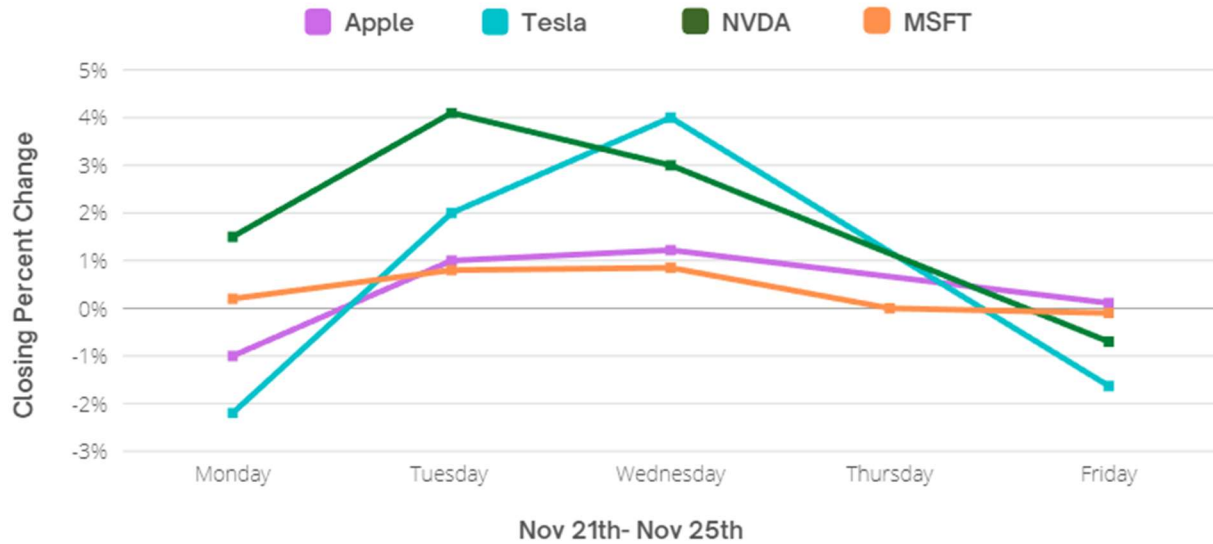


Figure 5.1.8.2 Dollar-cost averaging profit/ loss chart of week 8

5.1.9 Week Nine: November 28th– December 2nd, 2022

Shares of Tesla raced out of the gate Wednesday morning, climbing 2.3% in the first couple minutes of trading before beginning to fall back. Elon Musk tweeted last night that Tesla is now selling a "limited-edition Cyberwhistle" shaped like its Cybertruck. Company rose 5% over the week making the past two weeks a slight recovery the past 6 months Table 5.1.9.1. Tesla Could potentially have a comeback year in 2023, after the Twitter situation with Elon Musk settles down. See Table 5.1.9.1 below for more details.

Table 5.1.9.1 Dollar-cost averaging week 9

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Nov 28, 2022							\$20,552	
Nov 28, 2022	AAPL	Buy	\$145.14	17	\$2,508.01	4.10%	\$18,084	\$952.52
Nov 28, 2022	TSLA	Buy	\$179.96	15	\$2,582.44	5.90%	\$15,565	\$1327.87
Nov 28, 2022	NVDA	Buy	\$160.26	16	\$2,447.94	8.05%	\$13,161	\$1794.25
Nov 28, 2022	MSFT	Buy	\$246.08	10	\$2,426.05	7.60%	\$10,700	\$1,662.27
Dec 2, 2022							\$10,700	\$107,935

MSFT felt the effects of the stock market sell-off, with shares falling 28% year to date. However, the dip has only made the company's stock more attractive, with several promising developments planned for next year. With low consumer spending this year, 2023 is looking bright for MSFT and the entire tech sector. The sector moved together this week seen in Figure 5.1.9.2.

Company Performances Over Week Nine

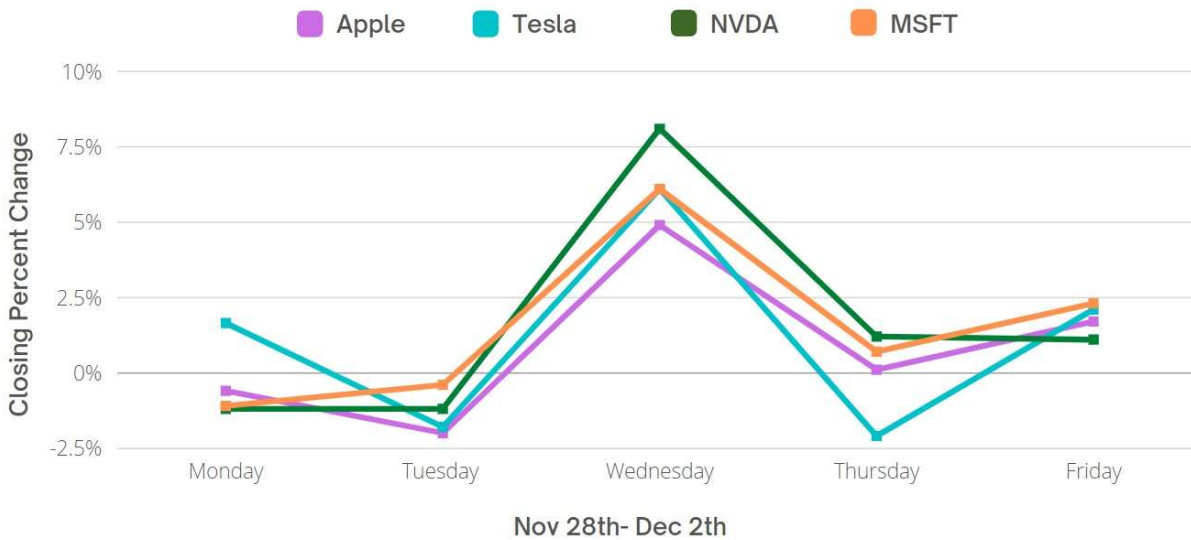


Figure 5.1.9.2 Dollar-cost averaging profit/ loss chart of week 9

5.1.10 Week Ten: December 5th – December 9th, 2022

Microsoft is reportedly planning to raise prices on premium first-party gaming titles. That news put investors' focus on its video game division, which is going through a minor recession. While its Xbox gaming systems are in high demand, players are less engaged than in the early phases of the pandemic. This has the chance to blow the companies Table 5.1.10.1; however, knowing Microsoft, they are very diverse. The cloud services segment stood out in the company's last report and helped overall sales expand at a brisk 16% pace after accounting for currency exchange rate shifts. See Table 5.1.10.1 below for more details.

Table 5.1.10.1 Dollar-cost averaging week 10

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
Dec 5, 2022							\$10,701	
Dec 5, 2022	AAPL	Buy	\$147.53	17	\$2,508.01	5.51%	\$8,192.63	1341.58
Dec 5, 2022	TSLA	Buy	\$184.46	14	\$2,582.44	2.81%	\$5,610.19	718.65
Dec 5, 2022	NVDA	Buy	\$167.82	17	\$2,852.94	3.21%	\$2,757.25	822.76
Dec 5, 2022	MSFT	Buy	\$250.55	11	\$2,756.05	2.10%	\$1.20	578.22
Dec 9, 2022							\$1.20	104,406

Nvidia gained momentum, up 32% in the past 3 and half months, due to the broader recovery in the stock market Figure 5.1.10.2. Triggered by favorable inflation data and the Federal Reserve's inclination toward slowing the pace of interest rate hikes. Yet Nvidia will need to cool down. This rapid gain is great until a slow or steep decline follows. See Figure 5.1.10.2. below for more details.

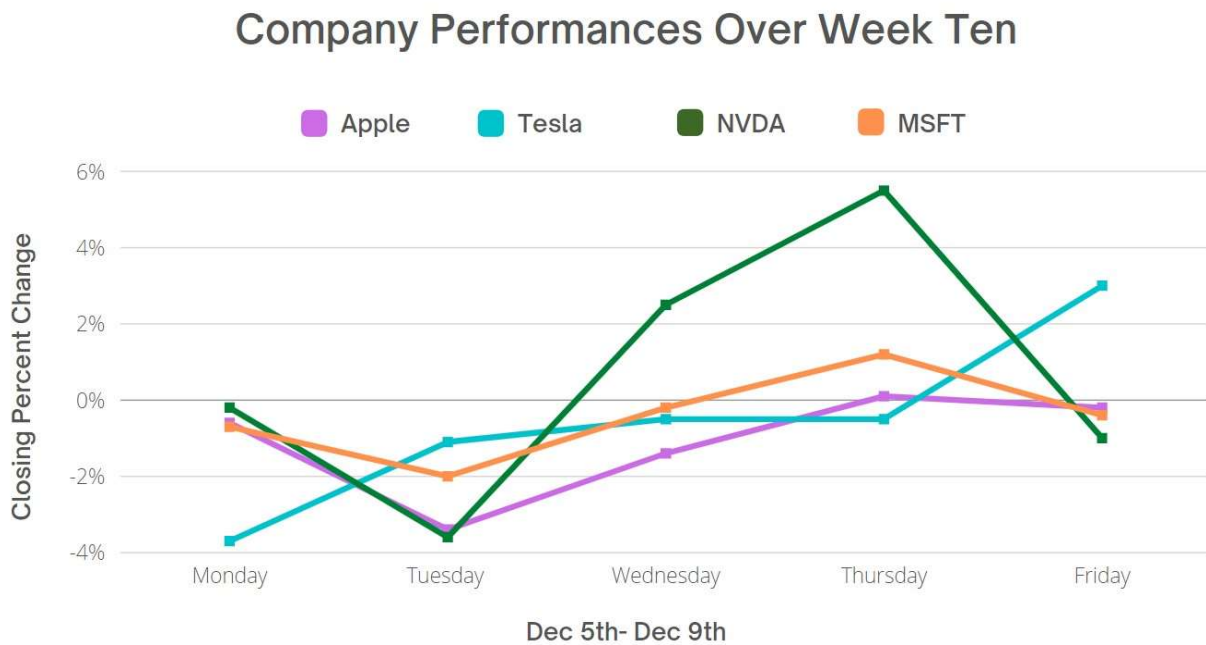


Figure 5.1.10.2 Dollar-cost averaging profit/ loss chart of week 10

5.2 Results and Analysis

This simulation tested Dollar-Cost-Averaging as a trading strategy over a ten-week market. Dollar-Cost-Averaging similarly reflected the general stock market performance over the last quarter of the year. While the year 2022 was a down year in nearly all sectors, that final quarter showed some positive signs going into the near year. Dollar-Cost Averaging from October 3, 2022, to December 11, 2022, produced a 4.41%. In other words, an increase of \$4,406. Figure 5.2.1 shows that the S&P 500 followed a similar trend to the simulated strategy.

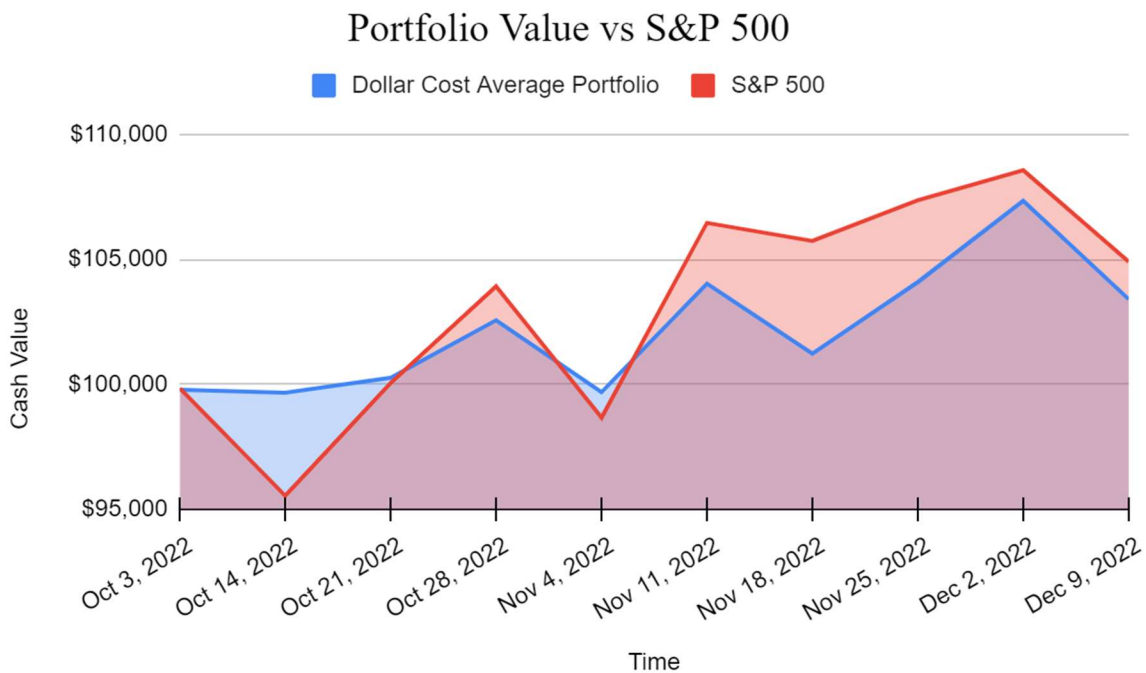


Figure 5.2.1. 10-Week comparison between S&P 500 and collar-cost averaging

However, with a deeper look, the S&P 500 looks more volatile over the same span. Dollar-Cost-Averaging allows one to avoid the worst of a down market; however, at the same time can prevent one from the highest returns in a bull market. The strategy is very conservatives and low risk.

Because there are no lump sum payments, the potential of high gains is limited, yet it provides more security in the long run.

Chapter 6. Position Trading

6.1 Simulation

In this chapter, position trading will be utilized as the trading strategy. The initial available assets are \$200,000, and they will be equally divided into four parts, meaning that each company (Apple, Tesla, NVidia, and Microsoft) would receive roughly \$50,000 as a starting investment. We would then adjust the holding based on the general economic situation and the performance of these given stocks. By definition, position trading requires traders to buy stocks when stock prices are low and sell them when they are high. Unlike day trading, where traders buy and sell stocks within the same day, position traders hold the positions for a period of time before adjusting them. Since this is a 10-week simulation, stocks will be traded at a higher frequency than they normally are when adopting position trading as the trading strategy.

6.1.1 Week One Oct 3rd – 7th, 2022

At the beginning of Week 1, I started by distributing the total available assets (\$200,000) into four equal parts, meaning that each company would receive \$50,000. The detailed transactions for this week are shown in Table 6.1.1.1. Since I have little experience with stock trading, I would adjust my holding based on various factors, including the general economic situation, the performance of the given stocks, and the experience that I would garner from the initial experimental weeks.

Table 6.1.1.1 Transaction sheet for week 1 (Oct. 3 – Oct. 7)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit /Loss	Total Cash	Total Profit
10/3/2022							200,000	
10/3/2022	AAPL	Buy	139.03	179	24,886.37		175,113.63	0
10/3/2022	MSFT	Buy	236.06	105	24,786.30		150,327.33	0
10/3/2022	NVDA	Buy	123.16	202	24,878.32		125,449.01	0
10/3/2022	TSLA	Buy	246.69	99	24,422.31		101,026.70	0

During the first week of simulation, I invested roughly \$25,000 into each company with the expectation that stock prices would go up by the end of the week. Most companies' stock prices were on the rise during Monday, Tuesday, Wednesday, and Thursday as shown in Table 6.1.1.2 and Table 6.1.1.3. However, positive job reports for the month of September forced companies' stock prices to fall sharply on Friday, as can be seen from Table 6.1.1.3. The Labor Department reported early on Friday that American employers added 263,000 jobs in September, down from 315,000 in August [11]. Although the slight slowdown in hiring provided yet another indication that the Fed's efforts to cool the economy and reduce inflation were having an impact, the fact that the unemployment rate decreased to 3.5% from 3.7% reinforces the perception that the labor market is still strong [11]. Even though that is normally a good thing, a robust labor market at the current time is terrible news for investors because it indicates that the Fed will need to raise interest rates even further than it already has [11]. Companies will face higher costs as a result, which will diminish stock prices [11].

Table 6.1.1.2 Daily closing price for week 1 (Oct. 3 – Oct. 7)

Date	Apple	Microsoft	Nvidia	Tesla
10/3/2022	142.45	240.74	125.12	242.4
10/4/2022	146.1	248.88	131.67	249.44
10/5/2022	146.4	249.2	132.09	240.81
10/6/2022	145.43	246.79	131.3	238.13
10/7/2022	140.09	234.24	120.76	223.07
Purchase Price	139.03	236.06	123.16	246.69

Table 6.1.1.3 Daily percent change for week 1 (Oct. 3 – Oct. 7)

Date	Apple	Microsoft	Nvidia	Tesla
10/3/2022	0.00%	0.00%	0.00%	0.00%
10/4/2022	2.56%	3.38%	5.23%	2.90%
10/5/2022	0.21%	0.13%	0.32%	-3.46%
10/6/2022	-0.66%	-0.97%	-0.60%	-1.11%
10/7/2022	-3.67%	-5.09%	-8.03%	-6.32%

As a result, at the end of this week, the unrealized capital losses are \$2,824.54 as shown in Table 6.1.1.4. The unrealized capital gains or losses can be computed by calculating the difference between the current total value of a stock and the original purchase price of that stock. Gains or losses become realized when the stock is liquidated.

Table 6.1.1.4-Week 1 detailed performance (Oct. 3 – Oct. 7)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
AAPL	139.03	140.09	1.06	0.76%	179	25,076.11	189.74	0.76%
MSFT	236.06	234.24	-1.82	-0.77%	105	24,595.20	-191.1	-0.77%
NVDA	123.16	120.76	-2.4	-1.95%	202	24,393.52	-484.8	-1.95%
TSLA	246.69	223.07	-23.62	-9.57%	99	22,083.93	-2338.38	-9.57%
Total						96,148.76	-2824.54	-2.85%

Below is the Apple (Figure 6.1.1.5) and Tesla's (Figure 6.1.1.6) stock performances within this week.



Figure 6.1.1.5 Apple - week 1 stock performance (Oct. 3 – Oct. 7)

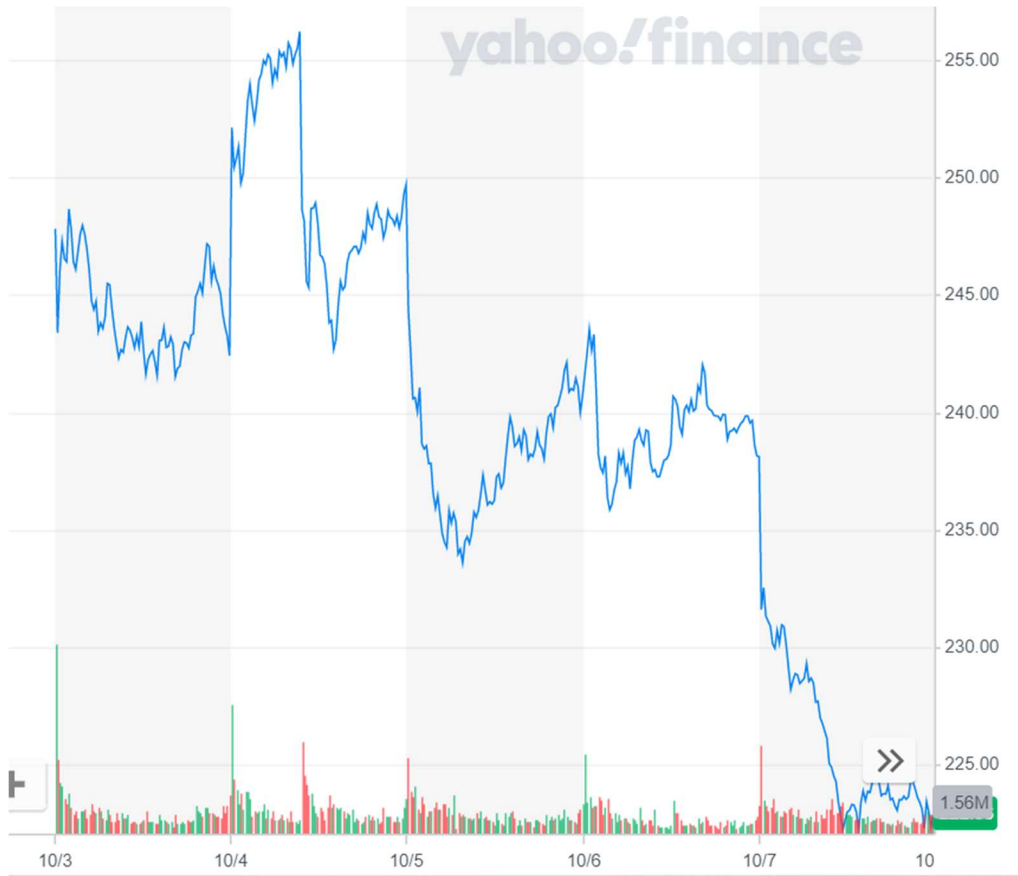


Figure 6.1.1.6 Tesla- week 1 stock performance (Oct. 3 – Oct. 7)

6.1.2 Week Two Oct 10th – 14th, 2022

During the second week of the simulation, all Apple and Tesla stocks were sold. However, those stocks were rebought on Oct 11th and Oct 13th respectively because of their potential to increase in price soon. The detailed transactions for this week are shown in Table 6.1.2.1.

Table 6.1.2.1 Transaction sheet for week 2 (Oct. 10 – Oct. 14)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
10/10/2022	TSLA	Sell	224.55	99	22,230.45	-2,191.86	123,257.15	-2,191.86
10/10/2022	AAPL	Sell	141.78	179	25,378.62	492.25	148,635.77	-1,699.61
10/11/2022	AAPL	Buy	138.60	360	49,896.00		98,739.77	
10/13/2022	TSLA	Buy	207.776	144	29,919.74		68,820.03	

As can be seen from the table, this week resulted in a loss of \$1,699.61. The majority of loss is contributed by Tesla, in which the company was down by 8.1%. Generally, the stock market was down last week because investors were anticipating that the Fed would further raise the interest rates, making it more challenging for companies to make loans and disrupting their plans to expand. Furthermore, the US government recently imposed new restrictions on technology exports to China. These news has negatively impacted the stock market, causing the stock prices to fall. The detailed performance for this week is shown in Table 6.1.2.2.

Table 6.1.2.2 Week 2 detailed performance (Oct. 10 – Oct. 14)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
AAPL	138.60	138.38	-0.22	-0.16%	360	49,816.80	-79.2	-0.16%
MSFT	236.06	228.56	-7.5	-3.18%	105	23,998.80	-787.5	-3.18%
NVDA	123.16	112.27	-10.89	-8.84%	202	22,678.54	-2,199.78	-8.84%
TSLA	207.776	204.99	-2.786	-1.34%	144	29,518.56	-401.18	-1.34%
Total						126,012.70	-3,467.66	-2.68%

As can be seen from Table 6.1.2.2, this week’s unrealized capital losses are \$3,467.66. By definition, unrealized capital losses can be computed by calculating the difference between the current total value of a stock and its original purchase price. Looking at Table 6.1.2.2, Apple and NVDA stock have the best and the worst performance respectively. Below is the Apple (Figure 6.1.2.3) and NVIDA’s (Figure 6.1.2.4) stock performances within this week.



Figure 6.1.2.3 Tesla- week 2 stock performance (Oct. 10 – Oct. 14)



Figure 6.1.2.4 NVIDIA- week 2 stock performance (Oct. 10 – Oct. 14)

6.1.3 Week Three Oct 17th – 21st, 2022

For Week 3 simulation, numerous trading activities were conducted. The detailed transactions for this week are shown in Table 6.1.3.1. As can be seen from the table, this week resulted in a profit of \$4,694.44.

Table 6.1.3.1 Transaction sheet for week 3 (Oct. 17 – Oct. 21)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/18/2022	AAPL	Sell	145.685	360	52,446.60	2,550.60	121,266.63	850.99
10/18/2022	MSFT	Sell	241.43	105	25,350.15	563.85	146,616.78	1,414.84
10/18/2022	TSLA	Sell	225.01	144	32,401.44	2,481.70	179,018.22	3,896.54
10/19/2022	AAPL	Buy	142.805	455	64,976.28		114,041.94	
10/19/2022	MSFT	Buy	234.84	212	49,786.08		64,255.86	
10/20/2022	NVDA	Sell	127.11	202	25,676.22	797.90	89,932.08	4,694.44
10/21/2022	NVDA	Buy	119.1	419	49,902.90		40,029.18	

The majority of profit is contributed by Apple and Tesla stocks. By selling stocks from these companies, I made a profit of \$2,550.60 and \$2,481.70 respectively. Generally, the stock market performed reasonably well this week. Apple, Microsoft, NVDA, and Tesla all went up this week, and thanks to that I was able to make a huge profit. Below is Table 6.1.3.2, which shows the detailed stock performance for Week 3.

Table 6.1.3.2 Week 3 detailed performance (Oct. 17 – Oct. 21)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
AAPL	142.805	147.27	4.465	3.13%	455	67,007.85	2,031.58	3.13%
MSFT	234.84	242.12	7.28	3.10%	212	51,329.44	1,543.36	3.10%
NVDA	119.1	124.66	5.56	4.67%	419	52,232.54	2,329.64	4.67%
Total						170,569.83	5,904.58	3.59%

6.1.4 Week Four Oct 24th – 28th, 2022

The detailed transactions for Week 4 are shown in Table 6.1.4.1. As can be seen from the table, this week resulted in a profit of \$13,367.70.

Table 6.1.4.1 Transaction sheet for week 4 (Oct. 24 – Oct. 28)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
10/25/2022	NVDA	Sell	128.11	419	53,678.09	3,775.19	93,707.27	8,469.63
10/26/2022	NVDA	Buy	129.89	384	49,877.76		43,829.51	
10/28/2022	AAPL	Sell	153.57	455	69,874.35	4,898.07	113,703.86	13,367.70

The majority of profit is contributed by Apple and NVIDIA stocks. By selling stocks from these companies, I made a profit of \$4,898.07 and \$3,775.19 respectively. Below is Table 6.1.4.2, which shows the detailed stock performance for Week 4.

Table 6.1.4.2 Week 4 detailed performance (Oct. 24 – Oct. 28)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
MSFT	234.84	235.87	1.03	0.44%	212	50,004.44	218.36	0.44%
NVDA	129.89	138.34	8.45	6.51%	384	53,122.56	3,244.80	6.51%
Total						103,127.00	3,463.16	3.47%

Below is the Apple (Figure 6.1.4.3) and NVIDIA's (Figure 6.1.4.4) stock performances within this week.



Figure 6.1.4.3 Apple - week 4 stock performance (Oct. 24 – Oct. 28)



Figure 6.1.4.4 NVIDIA- week 4 stock performance (Oct. 24 – Oct. 28)

6.1.5 Week Five Oct 31st – 4th, 2022

The detailed transactions for Week 5 are shown in Table 6.1.5.1. As can be seen from the table, this week resulted in a profit of \$11,458.35.

Table 6.1.5.1 Transaction sheet for week 5 (Oct. 31– Nov. 4)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
10/31/2022	AAPL	Buy	152.52	327	49,874.04		63,829.82	
11/2/2022	MSFT	Sell	223.08	212	47,292.96	-2,493.12	111,122.78	10,874.58
11/2/2022	NVDA	Sell	139.73	384	53,656.32	3,778.56	164,779.10	14,653.14
11/3/2022	NVDA	Buy	134.29	372	49,955.88		114,823.22	
11/3/2022	AAPL	Sell	142.75	327	46,679.25	-3,194.79	161,502.47	11,458.35

Below is Table 6.1.5.2, which shows the detailed stock performance for Week 5.

Table 6.1.5.2 Week 5 detailed performance (Oct. 31 – Nov. 4)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
NVDA	134.29	141.56	7.27	5.41%	372	52,660.32	2,704.44	5.41%
Total						52,660.32	2,704.44	5.41%

6.1.6 Week Six Nov 7th – 11th, 2022

The detailed transactions for Week 6 are shown in Table 6.1.6.1. As can be seen from the table, this week resulted in a profit of \$20,329.85.

Table 6.1.6.1 Transaction sheet for week 6 (Nov. 7– Nov. 11)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
11/8/2022	NVDA	Sell	148.01	372	55,059.72	5,103.84	216,562.19	16,562.19
11/10/2022	NVDA	Buy	148.25	337	49,960.25		166,601.94	
11/10/2022	MSFT	Buy	235.47	212	49,919.64		116,682.30	
11/11/2022	AAPL	Buy	144.76	345	49,942.20		66,740.10	
11/11/2022	NVDA	Sell	159.43	337	53,727.91	3,767.66	120,468.01	20,329.85

Below is Table 6.1.6.2, which shows the detailed stock performance for Week 6.

Table 6.1.6.2 Week 6 detailed performance (Nov. 7– Nov. 11)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
AAPL	144.76	149.7	4.94	3.41%	345	51,646.50	1,704.30	3.41%
MSFT	235.47	247.11	11.64	4.94%	212	52,387.32	2,467.68	4.94%
Total						104,033.82	4,171.98	4.18%

6.1.7 Week Seven Nov 14th – 18th, 2022

The detailed transactions for Week 7 are shown in Table 6.1.7.1. As can be seen from the table, this week resulted in a profit of \$17,815.13.

Table 6.1.7.1 Transaction sheet for Week 7 (Nov. 14– Nov. 18)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
11/14/2022	NVDA	Buy	160.12	312	49,957.44		70,510.57	
11/18/2022	NVDA	Sell	152.06	312	47,442.72	-2,514.72	117,953.29	17,815.13

Below is Table 6.1.7.2, which shows the detailed stock performance for Week 7.

Table 6.1.7.2 Week 7 detailed performance (Nov. 14– Nov. 18)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
AAPL	144.76	151.29	6.53	4.51%	345	52,195.05	2,252.85	4.51%
MSFT	235.47	241.22	5.75	2.44%	212	51,138.64	1,219.00	2.44%
Total						103,333.69	3,471.85	3.48%

6.1.8 Week Eight Nov 21st – 25th, 2022

The detailed transactions for Week 8 are shown in Table 6.1.8.1.

Table 6.1.8.1 Week 8 detailed performance (Nov. 21– Nov. 25)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/Loss	Total Cash	Total Profit
11/22/2022	NVDA	Buy	155.96	320	49,907.20		68,046.09	

Below is Table 6.1.8.2, which shows the detailed stock performance for Week 8.

Table 6.1.8.2 Week 8 detailed performance (Nov. 21– Nov. 25)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
AAPL	144.76	148.11	3.35	2.31%	345	51,097.95	1,155.75	2.31%
MSFT	235.47	247.49	12.02	5.10%	212	52,467.88	2,548.24	5.10%
NVDA	155.96	162.7	6.74	4.32%	320	52,064.00	2,156.80	4.32%
Total						155,629.83	5,860.79	3.91%

6.1.9 Week Nine Nov 28th – Dec 2nd, 2022

The detailed transactions for Week 9 are shown in Table 6.1.9.1. As can be seen from the table, this week resulted in a profit of \$29,067.01.

Table 6.1.9.1 Transaction sheet for Week 9 (Nov. 28– Dec. 2)

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
11/28/2022	TSLA	Buy	180.73	276	49,881.48		18,164.61	
12/1/2022	MSFT	Sell	253.17	212	53,672.04	3,752.40	71,836.65	21,567.53
12/1/2022	NVDA	Sell	167.64	320	53,644.80	3,737.60	125,481.45	25,305.13
12/1/2022	TSLA	Sell	194.36	276	53,643.36	3,761.88	179,124.81	29,067.01

Below is Table 6.1.9.2, which shows the detailed stock performance for Week 9.

Table 6.1.9.2 Week 9 detailed performance (Nov. 28– Dec. 2)

SYMBOL	PURCHASE PRICE	CURRENT PRICE	CHG & % CHG		SHARES	MKT VALUE	GAIN & % GAIN	
AAPL	144.76	147.81	3.05	2.11%	345	50,994.45	1,052.25	2.11%
Total						50,994.45	1,052.25	2.11%

6.1.10 Week Ten Dec 5th – 9th, 2022

During the final week, all Apple shares were sold to finalize the overall trading results of the 10-week position trading simulation. Overall, the simulation is a great success as it has gained \$28,170.01 or 14.9% in total profit. Even though the current stock market is experiencing a difficult time, this simulation still produces great results thanks to the EMA crossover. With the assistance of EMA crossover, I was well informed about the market and was able to make good trading decisions. The detailed transactions for Week 10 are shown in Table 6.1.10.1.

Table 6.1.10.1 Transaction sheet for week 10 (Dec. 5– Dec. 9)

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
12/9/2022	AAPL	Sell	142.16	345	49,045.20	-897.00	228,170.01	28,170.01

6.2 Results

This simulation tested the position trading strategy in a ten-week simulation. The position trading gained a total of \$28,170.01 or 14.09%. This strategy is considered a brilliant success as it outperforms the S&P 500. Below is figure 6.2.1 and figure 6.2.2 which show the change in the portfolio value throughout the ten-week simulation for the position trading and the profit and loss of each company over the entire simulation.

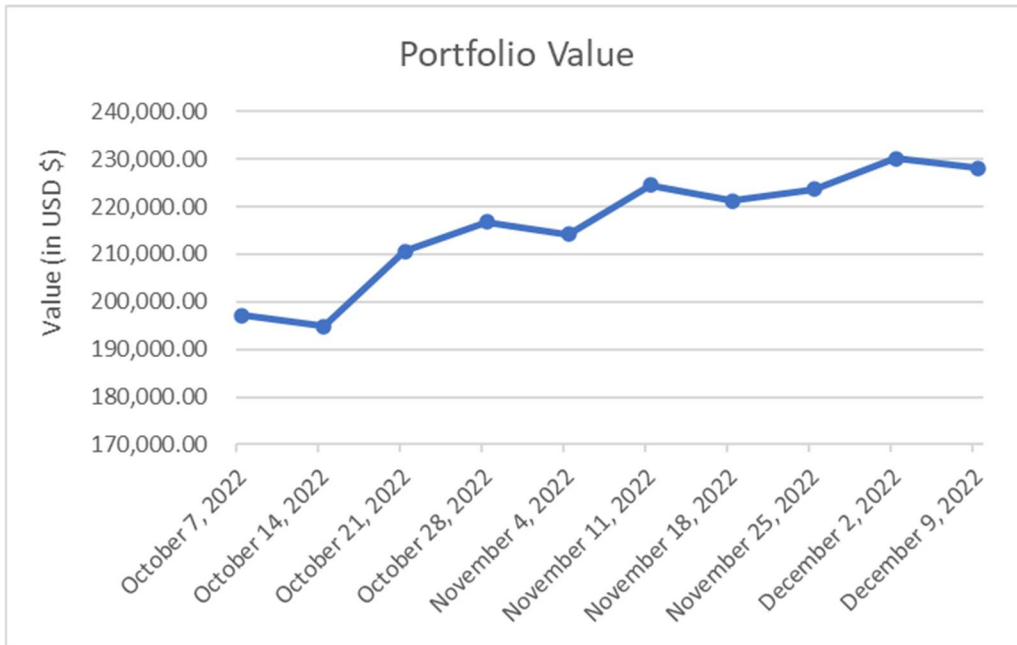


Figure 6.2.1 Position trading portfolio value throughout the simulation

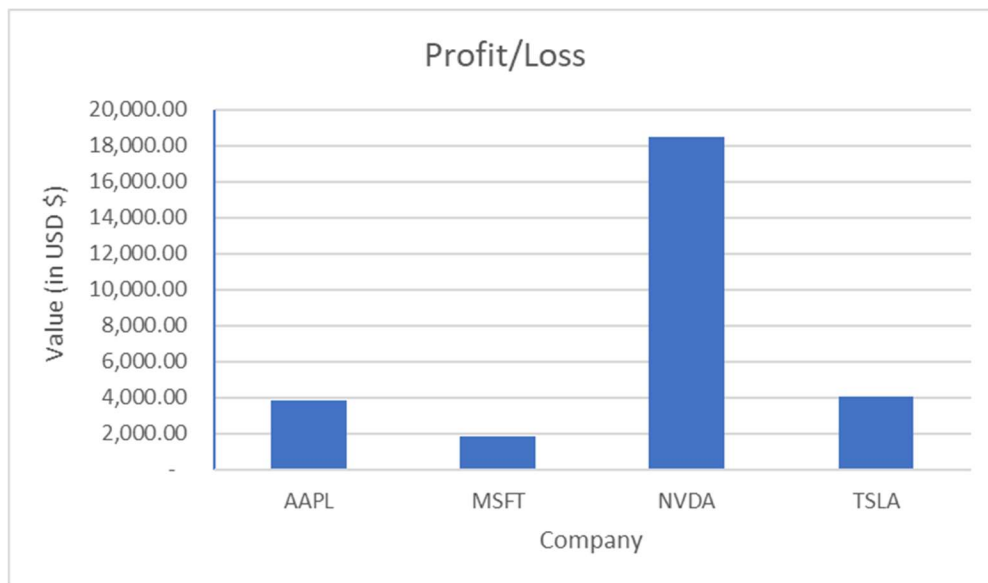


Figure 6.2.2 Position trading profit and loss

Chapter 7. Analysis

This simulation tested three trading strategies within a 10-week period: Scalp Trading (ST), Dollar-Cost Averaging (DCA) and Position Trading (PT). Their end balances were \$101,759.29, \$104,406, and \$228,170.01 respectively. Resulting in profits of 1.76% for Scalp Trading, 4.41% for Dollar-Cost Averaging, and 14.09 % for Position Trading. Below seen in (Figure 7.1.1) are the profit comparisons of all three trading methods and their respective total gains.

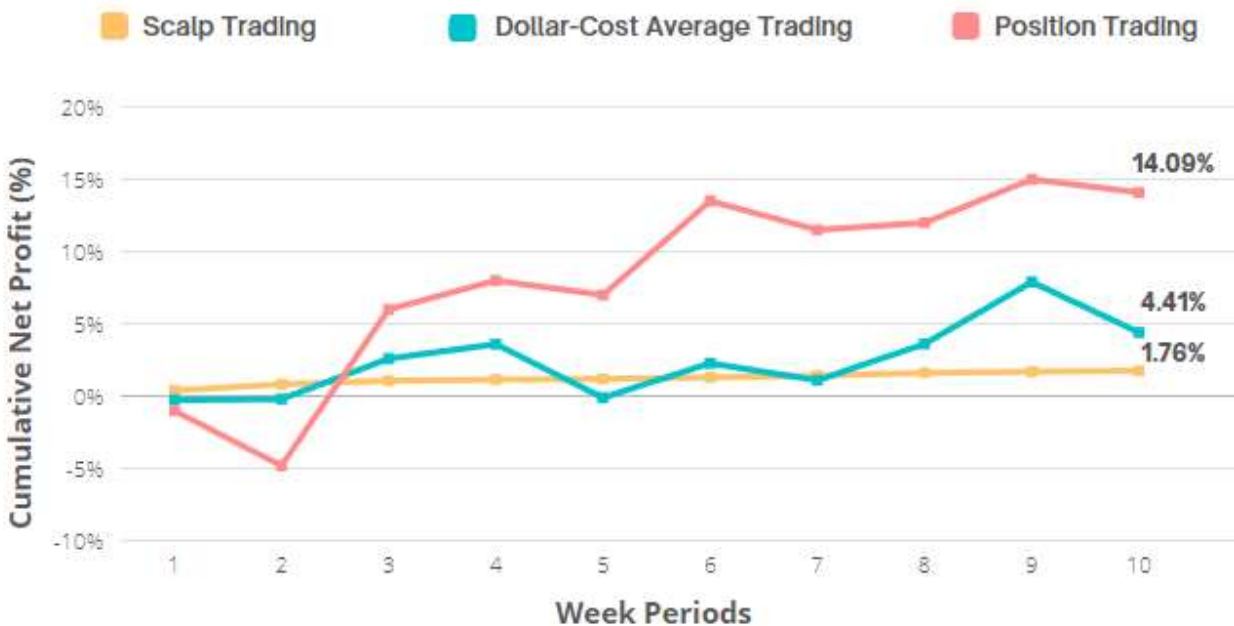


Figure 7.1.1 Profit comparison of scalp trading, dollar-cost average trading, and position trading over 10 weeks

Scalp Trading in terms of S&P 500 was very far from the trend. This method was also the least successful one in the project. Scalping is a method in which multiple trades are being done in a single day, and we conclude that twelve trades per week were not enough to show the full effect of this trading method and the benefits that it can bring to a portfolio. In addition, when this method

was being performed in the months of October to December, the market was mainly down, and it was very hard to earn big profit jumps with this method. On the other side, this method did not have a negative week.

Compared to the S&P 500, DCA followed the closet trend. The S&P 500 over the same 10-week period rose roughly 4.83%. Comparing both graphs' similarities at the support level and resistance level occurred generally at the moments. DCA had stronger support, however at the same time stronger resistance. In other words, it was more difficult for DCA to lose its profits while also having the same resistance in growing profits. This allows for less fluctuation and stronger dollar cost value for x company, yet a weaker chance of taking opportunities during bull markets.

Position Trading, on the other hand, did not closely follow the trend as shown in S&P 500. By applying the EMA crossover on position trading, we were able to identify upward and downward trends in the market. This technical analysis acts as an indicator that signifies traders whether or not to enter the trade. With the help of EMA crossover, we were well informed about the market and were able to make good trading decisions. This can be the reason why Position Trading performed extremely well even though the stock market is experiencing a difficult time.

Chapter 8. Conclusion

After successfully completing three 10-week simulations, observations and analyses could be made to justify and explain various patterns and outcomes. Additionally, students now have more experience and would feel even more comfortable tackling the stock market and potentially performing well. Each student executed ten weeks of trading using one single trading method. Before beginning the simulation, the students had to educate themselves on such methods and standard analysis practices. Pre-simulation, students looked at the history of the stock market over the last century, and in doing so found patterns within larger sector and their respective bear and bull runs. Interestingly found that the technology sector besides the last years as constantly grown in value since the 80s. This could be better reflected when comparing the NASDAQ and the S&P 500. Where the NASDAQ is composed of more technology-based companies while the S&P 500 is better representation of the entire market. The NASDAQ has consistently outperformed the S&P 500 year to year, due to its volume of tech companies performing significantly well. This pattern of strong growth excited the students enough to solely invest and simulate their trading methods within the technology sector. The next step was to learn how to trade and how to trade each method effectively. After students have grasped a good understanding, they start executing and documenting every action with all their summed-up knowledge. At the simulation's totality, students could study, research, and execute real-life trading methods facing common obstacles. The students gained valuable experience with technical and data analysis and the general nature of buying and selling assets.

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