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Stock Market Simulation

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Abstract

This project was a six-week stock market simulation. The goal for this project is to gain knowledge of the stock market (history and how it works) and apply that knowledge to make successful profit over the course of the simulation. Two trading methods were utilized, these being the Buy and Hold strategy and the Swing Trading strategy. The trading platform used was Investopedia. Each method had a corresponding portfolio which each contained stocks from five companies. At the end the simulation, buy and hold strategy lost 4.4% while the Swing Trading strategy lost only 1.7%. This project provided the participants with trading experience which will be helpful for future investments.

Acknowledgements

The progress made throughout this IQP would not have been possible without the help of certain individuals. First off, we would like to thank Professor Tang for his commitment to continuously guiding us throughout the course of the project. In addition, we would like to thank each other as partners for working together each week and persisting through hardships to complete this project. We would also like to thank our parents for funding this project so that we can complete this project in just two terms. Lastly, we want to thank our school Worcester Polytechnic Institute (WPI) for logistical support.

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Chapter 1: Introduction

1.1 Goals, Scope, and General Plan

The overarching goal of this project is to perform stock market simulations using real-time stock prices to gain knowledge about the stock market and find a strategy to make better profit in the market. The portfolio we will use will consist of companies selected based on our criteria. This same portfolio will be used to simulate two different trading strategies: The buy and Hold strategy and the Swing trade strategy. The simulations will be run for 6 weeks due to the time available for this project. We will take a more conceptual approach to longer-term trading and see what results we can achieve. The trading platform that will be used is Investopedia. The plan to reach our ultimate goal which is to make a profit in the simulation is to use two different strategies. One strategy is called buy and hold, and the other is swing trade. Each strategy will have its own portfolio with different stocks and be traded at the same time.

1.2 History of the Stock Market

The idea of trading goods can be traced back to early civilization. Merchants would have to travel overseas to get to other countries to make transactions possible. These transactions would typically take place in the middle of town called Antwerp (or modern-day Belgium) where merchants from across the globe would gather and trade goods. But these exchanges would not have any stocks involved. Instead, merchants would use bonds and IOUs. Merchants would also have to account for the differences in currencies via money exchange to make trading fair. By the late 1400s, Antwerp would soon become the center for international trade [1].

Fast forward to a couple hundred years later, Amsterdam would soon become home to the first modern day stock market. Here, the Dutch East India Company would become the first publicly traded community. To raise capital, the company would sell stock and pay dividends on

the shares to investors. Soon in 1611, the Amsterdam stock exchange would be created, and for the coming years, the Dutch East India Company would be the only company with trading activity on the exchange. But soon enough, other countries would try to mimic and create similar companies. This sparked anticipation in many investors, but this excitement would cause them to mindlessly invest in companies without investigating the organization. Overall, this would lead to financial instability, caused by investors pressured to sell all their shares. The absence of buying shares would give rise to the eventual market crash [1].

The stock market would soon reach the U.S. in the late 1700s as a group of merchants would come together to make the Buttonwood Tree Agreement, which would be the founding document of the New York Stock Exchange (NYSE). Even though the NYSE would be considered the largest stock exchange in the U.S., it was not the first. In 1790, the Philadelphia stock exchange would have a significant impact on global economy, aiding in the development of the U.S.'s financial sectors and its westward expansion. In 1971, the National Association of Securities Dealers Automated Quotations (NASDAQ) would be formed as another stock exchange. As opposed to the NYSE, the NASDAQ allowed investors to buy and sell stocks through computers, which can be seen as a notable upgrade [1].

1.3 Factors That Influence the Stock Market

Patterns in the stock market are often unpredictable and can seem divorced from economic factors. Generally, stock prices seem consistent and unvarying from day to day, but every now and then there are stark increases and decreases in stock prices caused by certain factors. These factors can range from global crisis to natural disasters, or even to poor decision making.

Elements like low interest rates and economic growth can contribute to a more favorable stock market. Higher economic growth leads to more demand for goods and services, making firms

more profitable. This will boost company dividends, and consequently, also share prices. Lower interest rates can make shares more appealing by boosting economic growth and making firms more profitable. Also, if bond yield falls, it may motivate investors who hold bonds to invest in shares, making it less risky for them [2].

If investors think overpriced government bonds or commodities are going to fall, they are more likely to invest in them benefiting the stock market [2].

Lastly, mood plays a crucial role in how the stock market fluctuates. If there is optimistic news about economic stability, then investors will be more likely to buy shares, therefore increasing the price of stock. If they receive unfavorable news (such as natural disasters, political instability, or terrorist attacks), investors will be more likely to sell, decreasing the price of stock. There is also this notion known as the bandwagon effect, which refers to the overreaction to certain events. If a stock falls, people may sell before the market has time to recover lost ground. Even though no economic problem is present, the stock market can still drastically fall, and this issue is caused by people following the mood [2].

1.4 Stock Market Indices

A stock market index is a hypothetical portfolio investment holding that represents some portion of the financial market. Generally, stock market indexes measure the performance of the stock market. Investors use indexes to compare current stock price levels to past price levels to gauge how well the market is doing, allowing investors to see a simplified snapshot of the market sector without having to study every asset in that index. The movement of the top three indexes is what is reported on media platforms. There are many different indexes in the stock market, some of the ones that are going to be useful to us in this simulation include the Standard & Poor's 500

Index, Dow Jones Industrial Average Index, NASDAQ Composite Index, and the Russell 2000 Index [3].

1.4.1 Standard & Poor's 500 Index

The Standard & Poor's 500 (or simply the S&P 500) is a market index in which tracks the performance of the 500 largest companies listed on stock exchanges in the U.S. Many investors and analysts consider the S&P 500 to be the best stock market index. Unlike some of the other indexes, the S&P 500 is market cap-weighted, meaning that it computes a weighted average of the stocks constituting that index. This method gives a higher percentage allocation to companies with bigger market capitalizations. Problems with the weighted average rise when a heavily weighted and overvalued stock inflate the overall value of the index [4].

The current market value of the S&P 500 is \$4,288.05, and its market summary from 1983 to 2023 is given below in Figure 1.1.



Figure 1.1 S&P 500 Market Summary from 1983 to 2023

1.4.2 Dow Jones Industrial Average Index

The Dow Jones Industrial Average (or simply DJIA) is a stock market index that tracks 30 large, publicly owned blue-chip companies (recognized nationally for positive reputation) trading on the NYSE and NASDAQ. Many investors today correlate a strong economy with a well-performing DJIA. The index is price weighted, meaning stocks with higher share prices are given more weight. Unfortunately, many believe that having a price-weighted index comes with some restrictions. Factoring only the price of a stock, and not also the company's market cap, does not accurately reflect a company. So, a company with a higher stock price but a lower market cap would have more weight than a company with a lower stock price and a higher market cap, which is a bad representation of a company's size. Another flaw with the DJIA is that it only considers 30 companies, as opposed to the S&P 500 index which considers 500 companies. One can argue that involving more companies will paint a better image of how well the economy is doing [5].

The current market value of the DJIA is \$33,507.50, and its market summary from 1983 to 2023 is given below in Figure 1.2.



Figure 1.2 DJIA Market Summary from 1983 to 2023

1.4.3 NASDAQ Composite Index

The NASDAQ Composite is a market cap-weighted index of all the equity securities listed on the NASDAQ. This includes common stocks, ordinary shares, American Depositary Receipts, units of real estate investments trusts, and publicly traded partnerships. In contrast to the S&P 500 and DJIA indexes, the NASDAQ Composite Index includes the stocks of U.S international companies. As mentioned before, the NASDAQ Composite Index uses a market cap-weighted index, which is calculated by summing the market capitalization of its components based on the current price of the constituents, this total is then adjusted by a constant index divisor. This index is heavily weighted in the technology sector, followed by healthcare companies and consumer discretionary [6].

The current market value of the NASDAQ Composite is \$13,219.32, and its market summary from 1983 to 2023 is given below in Figure 1.3.



Figure 1.3 NASDAQ Composite Market Summary from 1983 to 2023

1.4.4 Russell 2000 Index

The Russell 2000 is an index which measures the performance of 2000 small-cap companies of the 3000 companies included in the Russell 3000 index. It is managed by FTSE Russell, a subsidiary of the London Stock Exchange. Since it is made up of the bottom two-thirds in terms of company size of the Russell 3000 index, it is more susceptible to changes in the economy. As opposed to other major indices discussed before, this index measures the performance of small-cap to mid-cap stocks. But like the S&P 500 and NASDAQ Composite indices, the Russell 200 index uses a market cap-weighted index [7].

The current market value of the Russell 2000 is \$1,785.10, and its market summary from 2004 to 2023 is given below in Figure 1.4.



Figure 1.4 Russell 2000 Market Summary from 2004 to 2023

1.5 Stock Market Indicators

One way that investors attempt to make profits in the market is by using indicators. Indicators are based on mathematical formulas and historical stock market data. Each indicator is different and each one is designed by an individual or group as a way of better understanding price

action in the stock market. Indicators will analyze the past performance of a stock to help the investor make more educated decisions about their investments. There are several types of indicators such as technical and fundamental [8].

1.5.1 Relative Strength Index

An example of a technical indicator is the RSI (Relative Strength Index). The RSI is a mathematical equation that takes the price of a stock over an adjustable period (usually 14 data points) and determines whether the stock is overbought or oversold. An RSI that returns a value of 70 or greater has determined that the underlying security is overbought. On the other hand, if the RSI value is 30 or under, the security is considered oversold. The trick that investors use is to buy when the stock is oversold and sell when it is overbought. However, this is not recommended because popular indicators like these are often priced into the market and are unreliable [9].

1.5.2 Simple Moving Average

Another technical indicator is the SMA (Simple Moving Average). This is another indicator based on a mathematical formula. This indicator takes in the number of periods that the average of a security is to be calculated over and the price action data points. A popular choice among investors is to use an SMA of 20 and 50 using a 1-day aggregation. The trick is to use these two indicators together, and when they cross it may indicate a good buy or sell signal. If the 50-day SMA crosses over the 200-day SMA (about 6 and a half months), it is considered a buy signal. If it does the opposite and crosses under the 200-day SMA, it is considered a favorable time to sell. A picture demonstrating a bullish crossover of the 20- and 50-day SMA is listed below as Figure 1.5 [10].

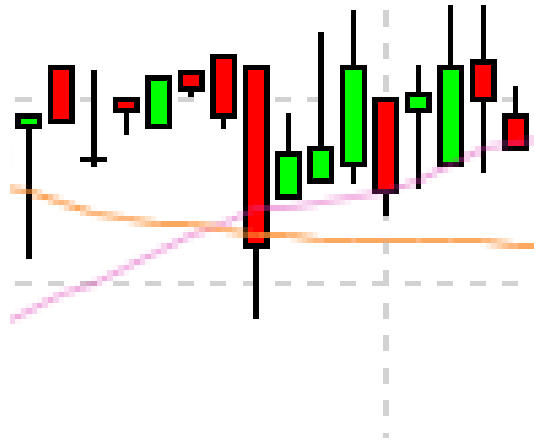


Figure 1.5 20-day SMA (purple line) does a Bullish Cross over 50-day SMA (orange line)

Figure 1.5 shown above demonstrates a bullish crossover where an investor may consider buying.

1.5.3 Price to Earnings Ratio

The Price to Earnings (P/E Ratio). It is a fundamental indicator used by investors to determine the value of a stock. It is said that the lower the P/E ratio the better of an investment it is in terms of value. A P/E ratio of 15 or lower is considered the best value by most investors. The higher the P/E ratio the less value you are getting out of your investment. The P/E ratio is calculated by taking the share price of a stock and the Earnings per Share (EPS). The EPS (Earnings Per Share) measures the amount of annual earnings(profit) a company makes per outstanding share. You then divide the share price of the stock by the EPS to get the P/E ratio [11].

1.6 Recent History of the Stock Market

The recent history of the stock market will be focused on the past 3 years. Beginning in March 2020, the stock market fell 30% over the course of a week, which was due to the COVID pandemic. In the following 6 months, the stock market grew 100% since the bottom of the 2020 crash in March. The beginning of 2022 marked a weak and volatile start to the year and continued

to fall 15% until 2023. The past 3 years have been extremely volatile and unpredictable due to uncertainty and unexpected market conditions throughout. Comparing today (9/17/2023) to 3 years ago, the stock market has grown 34% which is a little more than average considering the stock market returns an average of 7-10% a year. These market measurements were derived from the past 3-year history of the S&P 500, as well as major events(news) that have affected the stock market.

Chapter 2: Methodology

2.1 Stock Market Simulation Platform

Given the constant volatility and unpredictability of the market, it is essential that an investor understands the stock market before investing. Unfortunately, new investors who have no experience are bound to make mistakes and lose money should they trade real stocks. A safe alternative for new investors to learn about the stock market without taking any risks is using a stock simulation platform. These platforms simulate a real brokerage account. All of these simulations are online, and anybody can register for free. These simulators allow you to buy fake stocks with fake money, other words known as “paper money”. This makes it much easier for new investors to learn how to trade live stocks without trading stocks because the barrier of entry in terms of risk is zero.

A stock market simulator that allows us as new investors to trade paper money stocks for free is Investopedia. Investopedia offers real-time stock market data like a real stock brokerage account would. It also offers fast execution speeds for buying and selling so that positions can be acquired and sold at high speeds. The investor can buy and sell any stock that a US-based brokerage firm allows. Finally, each Investopedia portfolio created starts with \$100,000 in paper money for the investor to trade with. Figure 2.1 shows what the Investopedia portfolio tab looks like. This is where the total portfolio value(equity) is displayed as well as today's change and annual change in percentage.

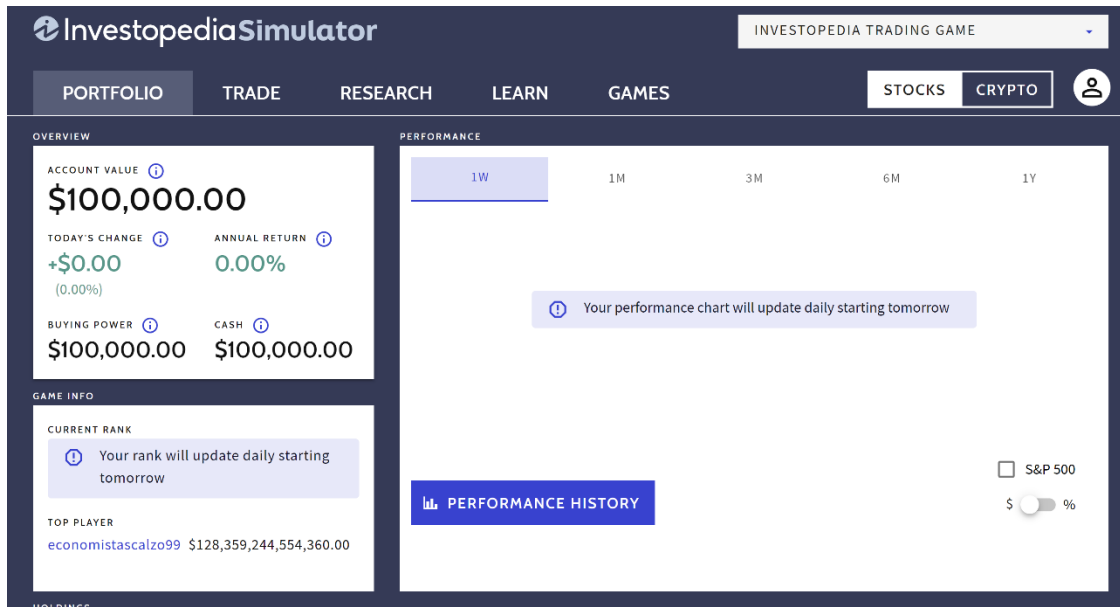


Figure 2.1 Investopedia Simulator Portfolio Tab

The portfolio tab shown in Figure 2.1 is just one of the 3 tabs that we will be using to track progress, make investments, and investment decisions. The next tab that we will use is the Trade tab. This tab allows us to buy and sell stocks using the paper money offered by Investopedia. The trade tab allows us to customize our buy and sell orders such as what stock we would like to buy and how much of it we would like to buy. Figure 2.2 below gives a screenshot of what the Investopedia trade tab looks like.

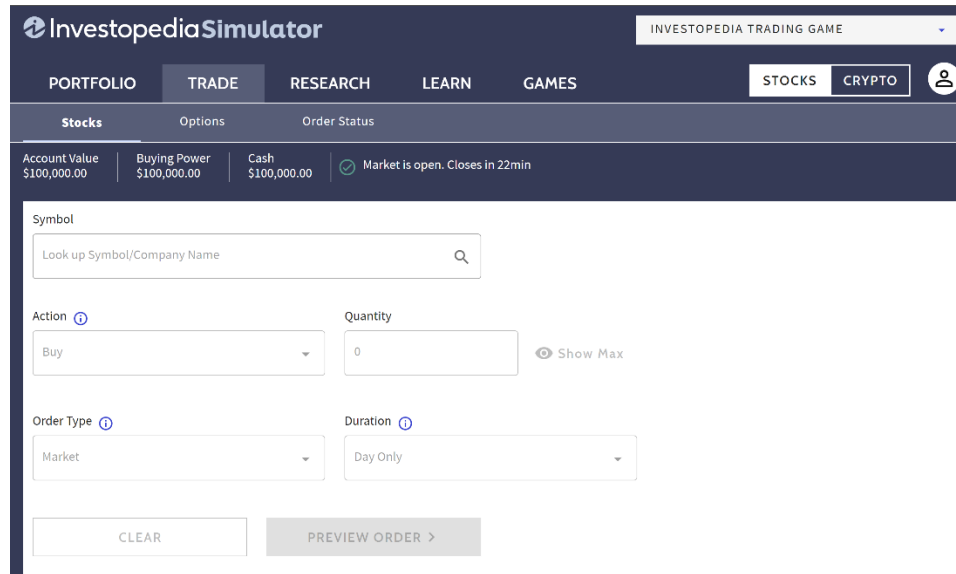


Figure 2.2 Investopedia Simulator Trade Tab

Under where it says symbol in Figure 2.2 is where you enter the ticker(symbol) of a specific stock. Quantity is where it allows you to buy or sell a specific amount of a stock. For example, if an investor wanted to buy 6 shares of Apple, they would enter “AAPL” under Symbol, select “Buy” under Action and then type in 6 under Quantity. This would set the order up to be executed. To execute orders the investor must press the button “Preview Order”. Once executed from the trade tab, the investor will be able to view the status of their positions under the portfolio tab. The last tab we will use on the Investopedia website is the “Research” tab. Figure 2.3 below gives a screenshot of what the Investopedia research tab looks like.

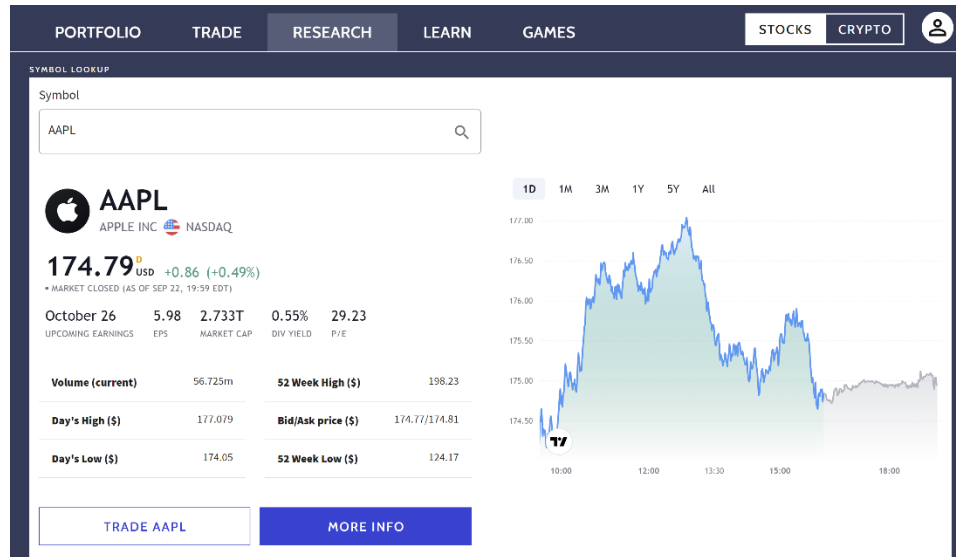


Figure 2.3 Investopedia Simulator Research Tab

To make more educated decisions about our investments we will use the research tab which provides us with much of the information necessary. To use the research tab, you need to enter the symbol for the stock you would like to learn more about. The research tab will give us a price chart and many other information such as the PE ratio and EPS.

The final choice for the simulation platform we will use is Investopedia because it is realistic, free, and provides us with everything we need for our investment plans.

2.2 Buy and Hold Strategy

There are many different strategies for investors to invest in the stock market and attempt to make a profit. One of the strategies is called the “Buy and hold strategy”. With the buy-and-hold strategy, an investor will buy a specific stock based on specific criteria, buy it, and keep it in their portfolio for a long time. The stock will perform passively without any interaction from the investor. Typically, an investor should expect to hold a stock with the “buy and hold” strategy for at least a year or more. This is a more long-term strategy and as a result, an investor will have no care for short-term indicators or results. An investor who chooses to use the buy-and-hold approach

will also become an active shareholder in the company that they invested in. The investor has voting power proportional to the number of shares that they own which means that they can vote on what goes on in the company. The type of shares that the investor will own in this scenario is known as “Common stock” [12].

2.3 Swing Trading

Swing trading is a trading technique that traders use to make profit by entering a position in a stock and then exiting that position within a brief period, being anywhere from days to weeks. Swing traders primarily use technical analysis, a method which examines statistical trends from trading activity, to predict where the market is headed so that they can benefit and make profit. When an investor swing trades, they will take technical indicators more deeply into consideration than the buy and hold strategy. Since technical indicators are best used in the short term, they will be used a lot for the swing trading strategy [13].

Chapter 3: Selected Companies

3.1 General Overview

The stocks that we will invest in will be strategically planned to make as much profit as possible. To achieve this, we have selected a handful of industries to invest in. Each industry contains many different companies, each with its own unique sizes, strengths, and weaknesses. To select the best companies, we need to select the best industries first. Each industry that we select will have good factors that influence growth in that industry. Some of the factors that we will look for are demographic trends, technological advancements, inelastic demand, expanding markets, diversity, and average expenditure. After selecting the industries, we must then select which companies in that industry we will invest in. Some of the factors that make a good stock investment that we will take into consideration are valuation, future growth, financial health, market trends, and competitive advantages.

3.2 Healthcare

Healthcare companies are more important than ever, especially after the COVID-19 outbreak. Pfizer is an American biotechnology and pharmaceutical company located at the Spiral in Manhattan, New York City. Pfizer (PFE) develops vaccines and medicines for oncology, immunology, cardiology, endocrinology, and neurology. Earlier this year, COVID was announced to no longer be a global pandemic and not a public health emergency of international concern. As new COVID strains emerge along with the fact that most people are now taking less precautions, it is safe to assume that COVID cases will rise to some degree. As a result, a higher demand for Pfizer vaccines is possible, especially when most people have already gotten their first vaccine shot from Pfizer. Figure 3.1 shows Pfizer's stock price over the past year, which is clearly on a

declining trend. But as established before, we expect the stock prices to increase within the next couple of months [14].



Figure 3.1 Pfizer Stock Price Over the Past Year

Vertex Pharmaceuticals (VRTX) is the next company we plan on investing in. Vertex Pharmaceuticals is a biopharmaceutical company based in Boston, Massachusetts that produces medicines through a unique strategy of rational drug design as opposed to combinatorial chemistry. The company discovered, invented, and produced the first drugs to combat against the underlying cause of cystic fibrosis. They also are advancing in research to find potential transformative treatments to diseases such as sickle cell disease, beta thalassemia, alpha-1 antitrypsin deficiency, APOL1-mediated kidney disease, Duchenne muscular dystrophy, type 1 diabetes and more. Figure 3.2 shows Vertex Pharmaceuticals stock price over the past year, which is on an upward trend since the year started [15].



Figure 3.2 Vertex Pharmaceuticals Stock Price Over the Past Year

3.3 Consumable Essentials

Companies in the Consumable Essentials industry experience consistent demand for their products and services. This is because companies in this industry make products and services that are essential to people's daily lives. As a result, these products and services are always being repurchased which provides a stable income for the company. Cleaning products will always be needed in people's daily lives, and as a result people will always need to buy them. The stock that we chose in this industry is Clorox (CLX). Clorox, which was founded in 1913, is known for its household cleaning products. Its products range from cleaning wipes to trash bags and many more. They are a name brand across the US as well as Internationally. Many people know what Clorox sells without needing advertising or explanation. This provides a stable reputation for the company. Clorox is also commonly found across many retail stores, making it a very easy product to buy which maximizes their sales. Along with these fundamentals, we can also see that the RSI (a technical indicator) of the stock is around 7. An RSI with a value of under 30 indicates that the

stock is oversold which makes it a good time to buy. Figure 3.3 shows the most recent price chart of Clorox [16].

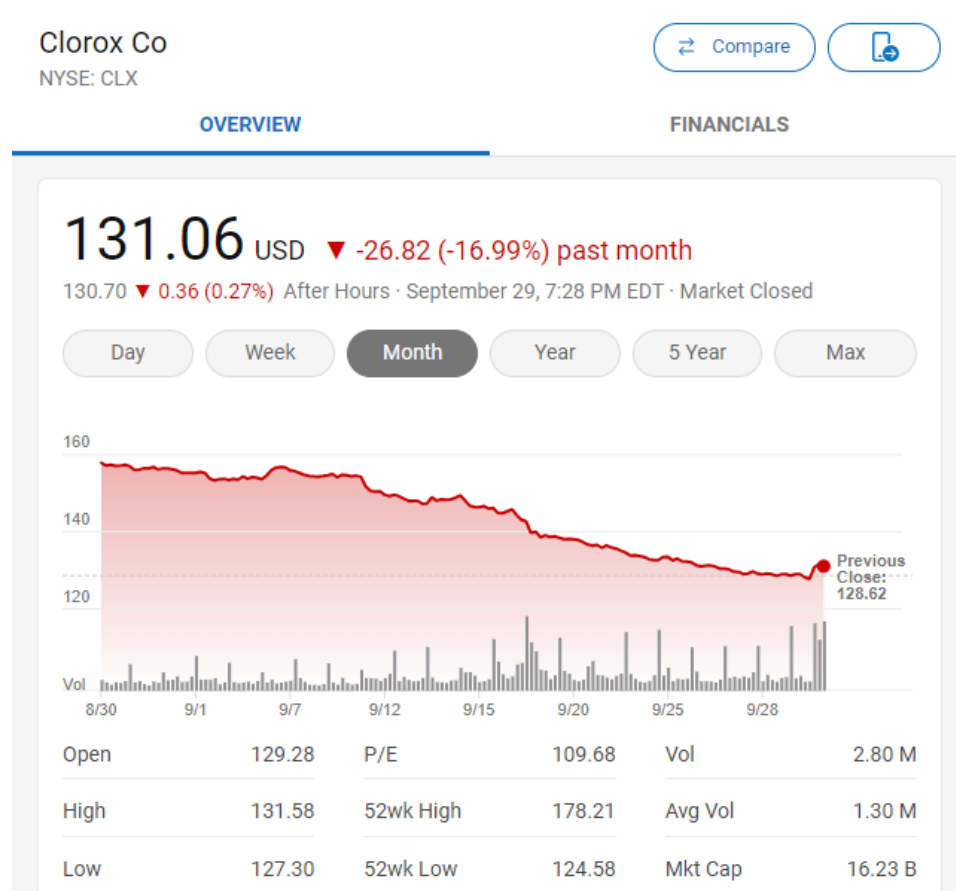


Figure 3.3 Clorox price chart over past month

For some people, soda is a product which is consumed and repurchased throughout the majority of their lives. Coke is arguably one of the most popular soda drinks and is widely consumed by many throughout the world. And for this reason, we are choosing Coca-Cola's (KO) stock for our portfolio. Coca-Cola is a multinational corporation founded in 1892 which is the producer of coke. The company's stock is listed on the NYSE and is a part of the DJIA and the S&P 500 indexes. Since 1889, the company has operated a franchised distribution system. The company mainly produces syrup concentrate which is then sold to various bottlers throughout the

world who hold executive territories. The soft drink was originally developed by pharmacist John Stith Pemberton in 1886. Later in 1889, the formula and brand were sold for \$2300 (which equates to roughly \$71,000 in 2022) to Asa Griggs Candler, who went on to incorporate the company in Atlanta. Figure 3.4, as shown below, shows Coca-Cola's stock price over the past year [17].

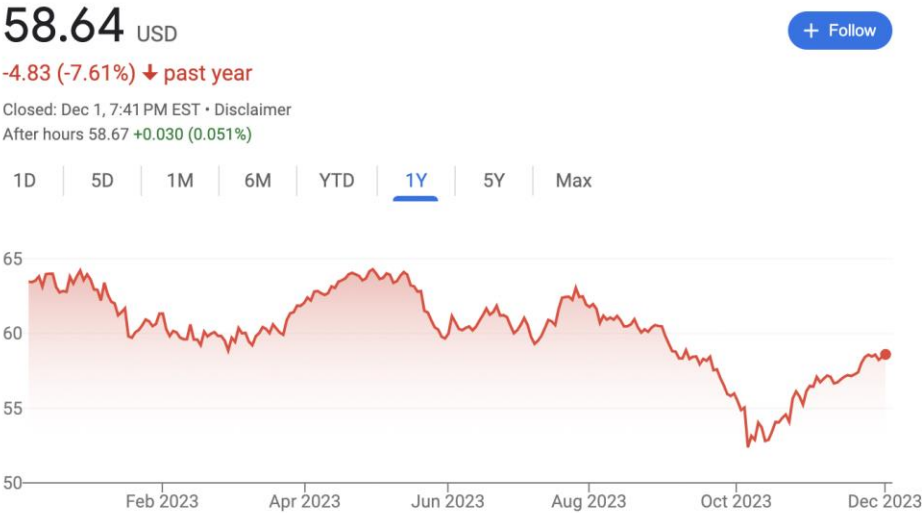


Figure 3.4 Coca-Cola Stock Price Over the Past Year

3.4 Utilities

Demand for utilities such as water, gas, and electricity will always be in demand despite how the economy is behaving. We live in times where resources such as these are vital to make a good living. For this reason, we are choosing Eversource Energy (ES) to utilize in our portfolio. Eversource Energy is a publicly traded energy company in Hartford, Connecticut and Boston, Massachusetts. They offer retail water service, electricity, and natural gas service to millions of customers located in a select number of states in New England. Eversource remains the largest electric utility for Connecticut and New Hampshire and a main distributor of energy for Massachusetts. As a result, we believe Eversource Energy is a good stock to invest in, especially

as we approach the colder winter months. Figure 3.5 shown below shows Eversource's stock price over the past year [18].



Figure 3.5 Eversource Energy Stock Price Over the Past Year

NextEra Energy (NEE) will also be used for similar reasons. NextEra Energy is the largest electric utility holding company by market capitalization and was ranked at one point one of the largest corporations by revenue on the Fortune 500. Its subsidiaries include Florida Power & Light, NextEra Energy Resources, NextEra Energy Partners, NextEra Energy Services, and the Gulf Power Company. NextEra Energy Resources is the world's largest generator of renewable energy from the wind and sun. In addition to this, they own generating plants powered by oil, natural gas, and nuclear energy. A substantial portion of NextEra Energy's generating capacity comes from fossil fuels. Figure 3.6 shown below shows NextEra Energy's stock price over the past year [19].



Figure 3.6 NextEra Energy Stock Price Over the Past Year

3.5 Cost-Conscious Retail

This industry is another one that will always be needed by consumers. This industry is one that targets customers who are sensitive to prices and are looking for value purchases. As a result of this, companies that operate in this industry are likely to make growth whenever there is a recession. Cheaper prices that provide value products will always attract customers on a budget. Another huge benefit for companies in this industry is the fact that they can purchase inventory in bulk which is cheap and provides comfortable margins on their products. The company that we will choose in this industry is Walmart. Walmart was founded in 1962 by Sam Walton in Rogers, Arkansas. They have 2 million employees worldwide and operate over 11,000 stores. It is fair to say that Walmart is a huge company that operates in this industry and is enjoying all the benefits of it. Such a huge company operating in a huge industry makes it a good investment to buy. Figure 3.7 shown below shows Walmart's stock price over the past year [20].



Figure 3.7 Walmart Stock Price Over the Past Year

The stock that we chose for the swing trading strategy in the Cost-Conscious Retail industry is Burlington Stores (BURL). Burlington stores is an American National department store retailer and a division of the Burlington Coat Factory, having over 1000 stores in 40 states (in addition to Puerto Rico), with headquarters located in Burlington Township, New Jersey. After TJX companies and Ross Stores, Burlington Stores comes third in being the one of the largest off-price retailers in America. Figure 3.8 shown below shows Burlington Stores' stock price over the past year [21].

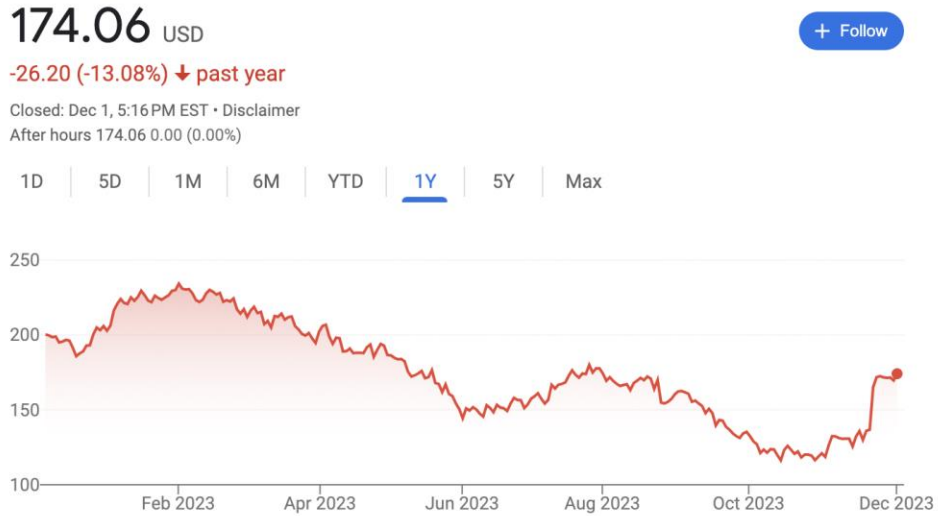


Figure 3.8 Burlington Stores Stock Price Over the Past Year

The main reason we chose this stock for swing trading is because of bullish technical indicators. The stock hit its bottom support line as well as having an RSI value of 22. With both reasons combined it is safe to say that the stock may be oversold, and it is a suitable time to buy. See Figure 3.9 below for a price chart of BURL.



Figure 3.9 Price chart of the stock BURL 10/5/2023

3.6 Travel

The travel industry is one that is essential to anyone who needs to travel long distances. United Airlines (UAL) is a major organization in Chicago, Illinois. Along with domestic travel, United also operates larger international routes spanning from larger cities from all over the globe. In 2010, United Airlines became the third-largest airline in the U.S. based on number of routes and fleet size. [22]

United Airlines has an impressive earnings surprise history, delivering an earnings surprise of 7.77% in the last four quarters on average. They also currently hold a Zacks Rank of #1 and have a VGM score of A. Research has shown that stocks with a solid Zacks Rank and VGM score offer some of the best investment opportunities. For these reasons, we decided to add United Airlines Stock to our buy and hold portfolio. Figure 3.10 shown below shows United Airlines' stock price over the past year [23].



Figure 3.10 United Airlines Stock Price Over the Past Year

Delta Airlines (DAL) is another major U.S. airline headquartered in Atlanta, Georgia. Delta has nine hubs, with Atlanta being the largest in terms of total departures and number of passengers. It is ranked second among the world's largest airlines by fleet size and number of passengers carried. Delta Airlines is ranked 113th of the Fortune 500 and is also ranked first in revenue and brand value [24].

As of recently, Delta Airlines has been reporting strong financial results, surpassing analysts' expectations in multiple quarters. Due to factors such as the ongoing recovery for air travel, the addition of new routes, the implementation of innovative pricing strategies, and investment in new aircraft, Delta's company earning has far exceeded expectations and are on the track for continued growth. Because of this, we decided to add Delta Airlines' stock to our swing trading portfolio. Figure 3.11 shown below shows Delta Airlines' stock price over the past year [25].

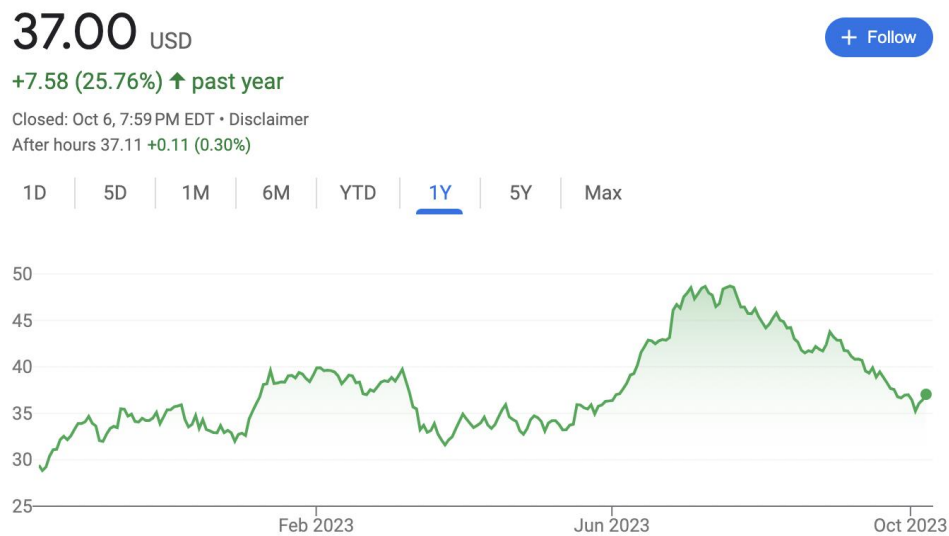


Figure 3.11 Delta Airlines Stock Price Over the Past Year

3.7 Chosen Stocks

The stocks that we chose are each in the different industries that were mentioned above. Each selected stock will utilize 20% of our portfolio. The five selected stocks in total will utilize 100% of our portfolio. Starting Monday (October 2, 2023), \$20,000 worth of shares for each stock will be spent to purchase them. For the next 6 weeks, the performance of each holding (stock) and the portfolio will be monitored. At the end of the 6-week period (November 6, 2023), the entire portfolio will be liquidated (every stock in the portfolio will be sold). We will have two portfolios that each use a different trading strategy. One portfolio will use the buy and hold strategy while the other portfolio will use the swing trading strategy. Each portfolio will have different stocks but all in the same chosen industries. One thing to note is that the swing trading strategy will buy and sell the same stocks in the same amount weekly. The stocks for the buy and hold strategy will not be bought and sold on Investopedia but instead recorded directly in the tables in chapter 5. The goal is to trade around \$100,000 at the start and end of each week. The start of the week being Monday and the end of the week being Friday. Stocks will be bought on Monday and sold on Friday as a weekend gap trading strategy. Holidays when the stock market is closed will also be accounted for.

Below are the five stocks that we selected to be part of our buy and hold portfolio:

PFE – Pfizer (Healthcare) 602 Shares

CLX – Clorox (Consumable Essentials) 152 Shares

ES – Eversource (Utilities) 343 Shares

WMT – Walmart (Cost-Conscious Retail) 125 Shares

UAL – United Airlines (Travel) 472 Shares

Figure 3.12, which is listed below, shows all the stock orders placed for our buy and hold strategy. These orders were placed on the day before the planned 6-week trading period so that they can be executed the second the market opens on Monday.

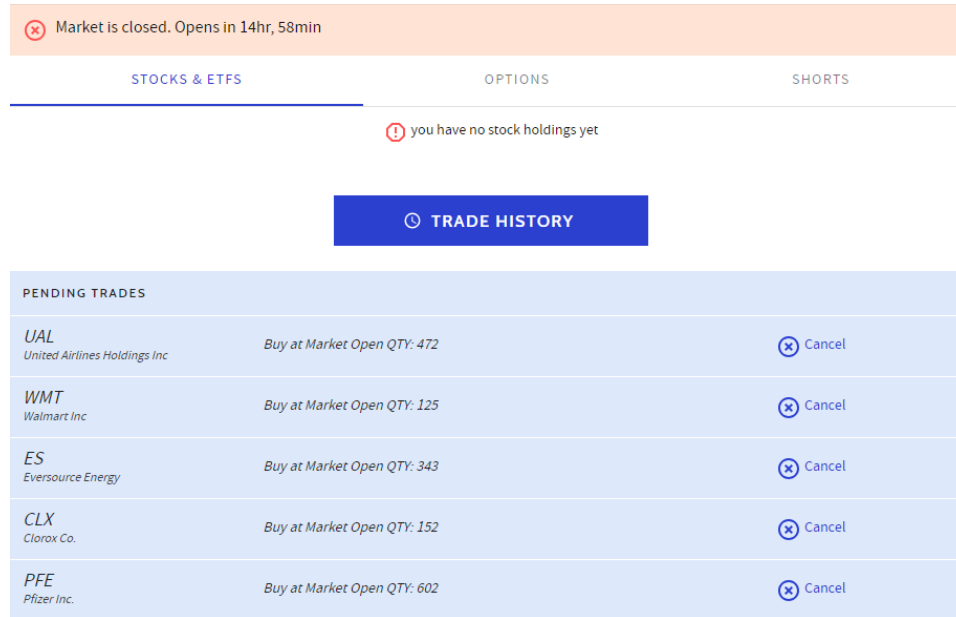


Figure 3.12 Shows the orders placed for buy and hold on 10/1/2023 before market open

Below are the five different stocks with their industries that we selected to be part of our swing trade portfolio:

VRTX - Vertex Pharmaceuticals (Healthcare) 57 Shares

KO – Coca-Cola (Consumer Essentials) 356 Shares

NEE – NextEra Energy (Utilities) 348 Shares

BURL – Burlington Stores (Cost-Conscious Retail) 146 Shares

DAL – Delta Airlines (Travel) 539 Shares

Figure 3.13 shows the orders placed for the swing trade portfolio the day before the 6-week holding period.

Market is closed. Opens in 15hr, 5min

STOCKS & ETFS OPTIONS SHORTS

you have no stock holdings yet

TRADE HISTORY

PENDING TRADES		
VRTX Vertex Pharmaceuticals, Inc.	Buy at Market Open QTY: 57	Cancel
KO Coca-Cola Co	Buy at Market Open QTY: 354	Cancel
NEE NextEra Energy Inc	Buy at Market Open QTY: 348	Cancel
BURL Burlington Stores Inc	Buy at Market Open QTY: 146	Cancel
DAL Delta Air Lines, Inc.	Buy at Market Open QTY: 538	Cancel

Figure 3.13 Shows the orders placed for swing trades day before market open 10/1/2023

Chapter 4: Buy-and-Hold Simulation

4.1 Week 1 (10/2 - 10/8)

The first week of the buy and hold strategy was a slight loss in terms of capital but otherwise successful. This is the result of the stocks bought one week ago on Monday (10/2/2023). No other trades were made in the first week. All the trades that were placed last week were executed at our desired price range for each stock. Below is a table of the profit/loss of each position as well as the status of the overall portfolio. The status of each position currently held in our portfolio is shown below in Table 4.1. Since the information for last Friday (before the trading began) was irrelevant/non-existent, we left some information out. The total gain/loss and the weekly gain/loss are the same because this is the first week.

Table 4.1 A chart displaying the current values of each position in our portfolio for Week 1

Start Date	Symbol	Buy Price	Shares	Net Cost	Price Last Friday	Price This Friday	Asset This Friday	Week Gain/Loss	Total Asset Gain/Loss
10/2/23	CLX	132	152	20064.00	-	125	19000.00	-1064.00	-1064.00
10/2/23	ES	57.81	343	19828.83	-	55.81	19142.83	-686.00	-686.00
10/2/23	PFE	32.95	602	19835.90	-	33.13	19944.26	+108.36	+108.36
10/2/23	UAL	42.32	472	19975.04	-	41.82	19739.04	-236.00	-236.00
10/2/23	WMT	159.49	125	19936.25	-	156.41	19551.25	-385.00	-385.00
				99640.02			97377.38	-2262.64	-2262.64

The portfolio lost around 2.3% (\$-2,262.64) because of the negative performance of the 6 stocks being held. The total current value of the portfolio is \$97,337.38. See Figure 4.1 for the status of each stock in our Investopedia investment portfolio as well as the portfolio itself.

TOTAL VALUE		TODAY'S CHANGE		TOTAL GAIN/LOSS	
\$97,377.38		\$0.00 (0.00%)		-\$2,262.64 (-2.27%) ↓	

Symbol	Description	Current Price	Today's Change	Purchase Price	QTY	Total Value	Total Gain/Loss	Trade Actions
CLX	Clorox Co.	\$125.00	\$10.64 (0.06%) ↑	\$132.00	152	\$19,000.00	-\$1,064.00 (-5.30%) ↓	+ Buy More - Sell
ES	Eversource Energy	\$55.81	\$205.80 (1.09%) ↑	\$57.81	343	\$19,142.83	-\$686.00 (-3.46%) ↓	+ Buy More - Sell
PFE	Pfizer Inc.	\$33.13	-\$204.68 (-1.02%) ↓	\$32.95	602	\$19,944.26	\$108.36 (0.55%) ↑	+ Buy More - Sell
UAL	United Airlines Holdings Inc	\$41.82	\$236.00 (1.21%) ↑	\$42.32	472	\$19,739.04	-\$236.00 (-1.18%) ↓	+ Buy More - Sell
WMT	Walmart Inc	\$156.41	-\$333.75 (-1.68%) ↓	\$159.49	125	\$19,551.25	-\$385.00 (-1.93%) ↓	+ Buy More - Sell

Figure 4.1 Screenshot of our Week 1 Buy and Hold Investopedia portfolio

4.2 Week 2 (10/9 - 10/15)

The second week of the buy-and-hold strategy was also another loss. We started off with \$97,337.38 last week. Since then, the value of the portfolio has declined to \$95,072.50. This decline in our portfolio is consistent with the S&P 500 market index. This means that our portfolio performance most likely declined because of the current market conditions rather than our predictions being wrong. See Table 4.2 for a chart displaying the details of the current positions held.

Table 4.2 A chart displaying the current values of each position in our portfolio for Week 2

Start Date	Symbol	Buy Price	Shares	Net Cost	Price Last Friday	Price This Friday	Asset This Friday	Week Gain/Loss	Total Asset Gain/Loss
10/9/23	CLX	132	152	20064.00	125	122.49	18612.40	-387.60	-1452.60
10/9/23	ES	57.81	343	19828.83	55.81	55.03	18875.29	-267.54	-953.54
10/9/23	PFE	32.95	602	19835.90	33.13	32.13	19330.22	-614.04	-505.68
10/9/23	UAL	42.32	472	19975.04	41.82	38.74	18275.84	-1463.20	-1699.20
10/9/23	WMT	159.49	125	19936.25	156.41	159.85	19978.75	427.50	+42.50
				99640.02			95072.50	-2304.88	-4567.52

The overall value of the portfolio for week 2 was \$95,072.50 which is down -\$2,304.88 from last week's portfolio value, which was \$97,337.38. See Figure 4.2 for a screenshot of our current Investopedia portfolio.

STOCKS & ETFS	OPTIONS	SHORTS
TOTAL VALUE		
\$95,072.50		
TODAY'S CHANGE		
\$0.00 (0.00%)		
TOTAL GAIN/LOSS		
-\$4,567.52 (-4.58%) ↓		
CLX	\$18,612.40	-7.23% ↓
ES	\$18,875.29	-4.81% ↓
PFE	\$19,330.22	-2.55% ↓
UAL	\$18,275.84	-8.51% ↓
WMT	\$19,978.75	0.21% ↑

Figure 4.2 Screenshot of our Week 2 Buy and Hold Investopedia portfolio

4.3 Week 3 (10/16 - 10/22)

Week 3 of our buy-and-hold portfolio was followed by yet another loss. All our buy-and-hold securities are at a loss from their initial value. Since these securities are meant to be held long-term, it is not fair to say that these are bad investments yet despite losing almost 10% of our portfolio. And since the fundamentals of these companies remain mostly the same, we cannot make any educated guesses on where the stock prices will be soon. Below is Table 4.3, which is a chart displaying the values of the current positions held in our portfolio.

Table 4.3 A chart displaying the current values of each position in our portfolio for Week 3

Start Date	Symbol	Buy Price	Shares	Net Cost	Price Last Friday	Price This Friday	Asset This Friday	Week Gain/Loss	Total Asset Gain/Loss
10/16/23	CLX	132	152	20064.00	122.49	122.80	18665.60	53.20	-1398.40
10/16/23	ES	57.81	343	19828.83	55.03	53.50	18350.50	-524.79	-1478.33
10/16/23	PFE	32.95	602	19835.90	32.13	30.65	18451.30	-878.92	-1384.60
10/16/23	UAL	42.32	472	19975.04	38.74	35.09	16562.48	-1713.36	-3412.56
10/16/23	WMT	159.49	125	19936.25	159.85	158.76	19845.00	-133.75	-91.25
				99640.02			91874.88	-3197.62	-7765.14

The current portfolio value for week 3 is \$91874.88 which is down -\$3,197.62 since last week's portfolio value which was \$95,072.50. Below is Figure 4.3 with a screenshot of the current portfolio in Investopedia.

TOTAL VALUE		TODAY'S CHANGE		TOTAL GAIN/LOSS	
\$91,874.88		\$0.00 (0.00%)		-\$7,765.14 (-7.79%) ↓	

Symbol	Description	Current Price	Today's Change	Purchase Price	QTY	Total Value	Total Gain/Loss
CLX	Clorox Co.	\$122.80	\$0.00 (0.00%) —	\$132.00	152	\$18,665.60	-\$1,398.40 (-6.97%) ↓
ES	Eversource Energy	\$53.50	\$0.00 (0.00%) —	\$57.81	343	\$18,350.50	-\$1,478.33 (-7.46%) ↓
PFE	Pfizer Inc.	\$30.65	\$0.00 (0.00%) —	\$32.95	602	\$18,451.30	-\$1,384.60 (-6.98%) ↓
UAL	United Airlines Holdings Inc	\$35.09	\$0.00 (0.00%) —	\$42.32	472	\$16,562.48	-\$3,412.56 (-17.08%) ↓
WMT	Walmart Inc	\$158.76	\$0.00 (0.00%) —	\$159.49	125	\$19,845.00	-\$91.25 (-0.46%) ↓

Figure 4.3 Screenshot of our Week 3 Buy and Hold Investopedia portfolio

4.4 Week 4 (10/23 - 10/29)

The week 4 progress for our buy-and-hold simulation resulted in another loss. This loss followed a loss in the S&P 500 of around 2% this week. The market has been on a downward trend recently. Unfortunately, the stocks in our portfolio have followed this market trend. Because the companies that are in this portfolio are considered blue chip stocks, they are more likely to experience market downturns. The position that has currently lost the most is DAL (Delta Airlines).

We expected Delta to recover from its low price since it was supposed to be relatively underpriced but that did not go as planned. See Table 4.4 for a more detailed chart regarding our positions.

Table 4.4 A chart displaying the current values of each position in our portfolio for Week 4

Start Date	Symbol	Buy Price	Shares	Net Cost	Price Last Friday	Price This Friday	Asset This Friday	Week Gain/Loss	Total Asset Gain/Loss
10/23/23	CLX	132	152	20064.00	122.80	117.93	17925.36	-740.25	-2138.64
10/23/23	ES	57.81	343	19828.83	53.50	53.16	18233.88	-116.62	-1594.95
10/23/23	PFE	32.95	602	19835.90	30.65	30.11	18126.22	-325.08	-1709.68
10/23/23	UAL	42.32	472	19975.04	35.09	33.90	16000.80	-561.68	-3974.24
10/23/23	WMT	159.49	125	19936.25	158.76	161.17	20146.25	301.00	+210.00
				99640.02			90432.51	-1442.63	-9207.51

Our total portfolio balance at the end of week was \$90,432.51 which was a -\$1,442.63 loss since last week's value of \$95,072.50. See Figure 4.4 for a screenshot of our current portfolio balance in Investopedia.

TOTAL VALUE		TODAY'S CHANGE		TOTAL GAIN/LOSS			
\$90,432.51		\$0.00 (0.00%)		-\$9,207.51 (-9.24%) ↓			
Symbol	Description	Current Price	Today's Change	Purchase Price	QTY	Total Value	Total Gain/Loss
CLX	Clorox Co.	\$117.93	-\$498.56 (-2.71%) ↓	\$132.00	152	\$17,925.36	-\$2,138.64 (-10.66%) ↓
ES	Eversource Energy	\$53.16	-\$343.00 (-1.85%) ↓	\$57.81	343	\$18,233.88	-\$1,594.95 (-8.04%) ↓
PFE	Pfizer Inc.	\$30.11	-\$632.10 (-3.37%) ↓	\$32.95	602	\$18,126.22	-\$1,709.68 (-8.62%) ↓
UAL	United Airlines Holdings Inc	\$33.90	-\$481.44 (-2.92%) ↓	\$42.32	472	\$16,000.80	-\$3,974.24 (-19.90%) ↓
WMT	Walmart Inc	\$161.17	-\$75.00 (-0.37%) ↓	\$159.49	125	\$20,146.25	\$210.00 (1.05%) ↑

Figure 4.4 Screenshot of our Week 4 Buy and Hold Investopedia portfolio

4.5 Week 5 (10/30 - 11/05)

Week 5 for the buy-and-hold portfolio was an improvement from last week. The portfolio's value is still less than what it started, but only around \$5k less. These returns were consistent with

the S&P 500 Index which rose by around 5% since last week. This portfolio seems to be consistent with the returns of the S&P 500. Our swing trade portfolio seems to have a more sensitive reaction to price changes in the S&P 500.

Table 4.5 A chart displaying the current values of each position in our portfolio for Week 5

Start Date	Symbol	Buy Price	Shares	Net Cost	Price Last Friday	Price This Friday	Asset This Friday	Week Gain/Loss	Total Asset Gain/Loss
10/30/23	CLX	132	152	20064.00	117.93	125.55	19083.60	+1158.24	-980.40
10/30/23	ES	57.81	343	19828.83	53.16	55.43	19012.49	+778.61	-816.34
10/30/23	PFE	32.95	602	19835.90	30.11	31.26	18818.52	+692.30	-1017.38
10/30/23	UAL	42.32	472	19975.04	33.90	37.51	17704.72	+1703.92	-2270.32
10/30/23	WMT	159.49	125	19936.25	161.17	164.66	20582.50	+436.25	+646.25
				99640.02			95201.83	+4769.32	-4438.19

Our portfolio value for week 5 buy-and-hold strategy \$95,201.83 was a slight improvement from last week's portfolio value of \$90,432.51. See Figure 4.5 for a screenshot of our Investopedia portfolio.

TOTAL VALUE		TODAY'S CHANGE		TOTAL GAIN/LOSS			
\$95,201.83		\$0.00 (0.00%)		-\$4,438.19 (-4.45%) ↓			
Symbol	Description	Current Price	Today's Change	Purchase Price	QTY	Total Value	Total Gain/Loss
CLX	Clorox Co.	\$125.55	\$0.00 (0.00%) —	\$132.00	152	\$19,083.60	-\$980.40 (-4.89%) ↓
ES	Eversource Energy	\$55.43	\$0.00 (0.00%) —	\$57.81	343	\$19,012.49	-\$816.34 (-4.12%) ↓
PFE	Pfizer Inc.	\$31.26	\$0.00 (0.00%) —	\$32.95	602	\$18,818.52	-\$1,017.38 (-5.13%) ↓
UAL	United Airlines Holdings Inc	\$37.51	\$0.00 (0.00%) —	\$42.32	472	\$17,704.72	-\$2,270.32 (-11.37%) ↓
WMT	Walmart Inc	\$164.66	\$0.00 (0.00%) —	\$159.49	125	\$20,582.50	\$646.25 (3.24%) ↑

Figure 4.5 Screenshot of our Week 5 Buy and Hold Investopedia portfolio

4.6 Week 6 (11/06 - 11/12)

Week six of the buy-and-hold portfolio remained relatively the same as last week. There was little to no price action this week in the stock market, and as a result, our portfolio remained the same. It's important to note how every week of the buy-and-hold portfolio remained extremely consistent with the stock market. For example, we observed that when the stock market goes up, so do the stocks in our portfolio. The same thing can be said for the other way around. See Table 4.6 for a detailed description of the stock prices.

Table 4.6 A chart displaying the current values of each position in our portfolio for Week 6

Start Date	Symbol	Buy Price	Shares	Net Cost	Price Last Friday	Asset This Friday	Week Gain/Loss	Total Asset Gain/Loss
10/2/2023	CLX	132	152	20064.00	125.55	20285.92	+1202.32	+221.92
10/2/2023	ES	57.81	343	19828.83	55.43	18453.40	-559.09	-1375.43
10/2/2023	PFE	32.95	602	19835.90	31.26	17746.96	-1071.56	-2088.94
10/2/2023	UAL	42.32	472	19975.04	37.51	17931.28	+226.56	-2043.76
10/2/2023	WMT	159.49	125	19936.25	164.66	20773.75	+191.25	+837.50
				99640.02		95191.31	-10.52	-4448.71

Our total portfolio value at the end of week 6 was \$95,191.31. This had no significant change from last week's portfolio value. See Figure 4.6 for a screenshot of our Investopedia portfolio.

TOTAL VALUE		TODAY'S CHANGE		TOTAL GAIN/LOSS	
\$95,191.31		\$0.00 (0.00%)		-\$4,448.71 (-4.46%) ↓	

Symbol	Description	Current Price	Today's Change	Purchase Price	QTY	Total Value	Total Gain/Loss
CLX	Clorox Co.	\$133.46	\$0.00 (0.00%)	\$132.00	152	\$20,285.92	\$221.92 (1.11%) ↑
ES	Eversource Energy	\$53.80	\$0.00 (0.00%)	\$57.81	343	\$18,453.40	-\$1,375.43 (-6.94%) ↓
PFE	Pfizer Inc.	\$29.48	\$0.00 (0.00%)	\$32.95	602	\$17,746.96	-\$2,088.94 (-10.53%) ↓
UAL	United Airlines Holdings Inc	\$37.99	\$0.00 (0.00%)	\$42.32	472	\$17,931.28	-\$2,043.76 (-10.23%) ↓
WMT	Walmart Inc	\$166.19	\$0.00 (0.00%)	\$159.49	125	\$20,773.75	\$837.50 (4.20%) ↑

Figure 4.6 Screenshot of our Week 6 Buy and Hold Investopedia portfolio

4.7 Buy and Hold Conclusion

Our buy and hold portfolio resulted in a loss of \$4,448.71 which is around 4.4% down from its original starting value of \$100,000. The ending value of this portfolio was \$95,191.31. We did not sell any of our shares in this portfolio, we only tracked their progress.

Chapter 5: Swing Trading Simulation

5.1 Week 1 (10/2 - 10/8)

The first week of the swing trade portfolio was also successful but at a slight loss. All the trades made since last Monday (10/2/2023) were executed at the desired market prices. The stocks being traded in this portfolio are in the same industry as the buy-and-hold portfolio but are riskier. As a result of this risk, the portfolio did feel the recent market downturn more heavily than the buy-and-hold portfolio. See Table 5.1 below for a chart of the most recent purchases for our portfolio. The total profit and profit/loss columns were left blank for the purchases because those are recorded and changed when we sell. These same tables will apply throughout the swing trade portfolio. Each week will include two tables. One is dedicated to selling and the other to buying. Stocks will be sold every Friday before the weekend and bought on the following Monday. Our goal to make a profit is to sell all shares right before the weekend and then buy them back the following Monday. Please note that the starting amount for all purchased securities is \$96127. We were given \$100,000 but we couldn't buy the perfect number of shares with it given the nature of stock prices.

Table 5.1 A chart of our Week 1 progress for our Swing Trading Portfolio

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
							100000	
10/2/2023	BURL	Buy	134.88	146	19692.48	-	80307.52	-
10/2/2023	DAL	Buy	36.97	538	19889.86	-	60417.66	-
10/2/2023	KO	Buy	55.91	354	19792.14	-	40625.52	-
10/2/2023	NEE	Buy	56.08	348	19515.84	-	21109.68	-
10/2/2023	VRTX	Buy	346.76	57	19765.32	-	1344.36	-
10/6/2023	BURL	Sell	123.46	146	18025.16	-1667.32	19369.52	-1667.32
10/6/2023	DAL	Sell	37	538	19906.00	16	39275.52	-1651.18
10/6/2023	KO	Sell	53.14	354	18811.56	-981	58087.08	-2631.76
10/6/2023	NEE	Sell	50.24	348	17483.52	-2,032	75570.60	-4664.08
10/6/2023	VRTX	Sell	360.62	57	20555.34	790	96125.94	-3874.06

The total portfolio value lost around \$4000 since purchasing all 6 stocks last Monday. Both portfolios lost money in the first week because of a market downturn. It is understandable that the swing trade portfolio lost more money than the buy-and-hold portfolio because the strategy itself assumes more risk. Inversely, if the market did well, the swing trading portfolio would have likely performed with higher returns in the short term. Please note the total starting amount for week 1 was \$96127 worth of securities. We had \$1,220 worth of cash left after all purchases.

5.2 Week 2 (10/9 - 10/15)

Week 2 of the swing trade portfolio was followed by another loss. With this loss, it was observed that it has been consistent with the current market downtrend that the S&P 500 has been experiencing. We have observed this with the other buy and hold portfolio. This means that since the stocks were chosen for different reasons yet experienced similar results, we can conclude that the most likely reason for our stocks falling in value is because the market as a whole went down. Below is one table that contains the buying and selling information of the swing trading portfolio. We will buy stocks every Monday at the market open and sell every Friday at market close, this

will be the same for every following week. Please see Table 5.2 for information about each stock sale.

Table 5.2 A chart of our Week 2 progress for our Swing Trading Portfolio

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
							96125.94	
10/2/2023	BURL	Buy	121.09	146	17679.14	-	78446.80	-
10/2/2023	DAL	Buy	35.71	538	19211.98	-	59234.82	-
10/2/2023	KO	Buy	52.96	354	18747.84	-	40486.98	-
10/2/2023	NEE	Buy	49.69	348	17292.12	-	23194.86	-
10/2/2023	VRTX	Buy	361.22	57	20589.54	-	2605.32	-
10/6/2023	BURL	Sell	116.31	146	16981.26	-697.88	19586.58	-4571.94
10/6/2023	DAL	Sell	34.10	538	18345.80	-866	37932.38	-5438.12
10/6/2023	KO	Sell	52.89	354	18723.06	-25	56655.44	-5462.90
10/6/2023	NEE	Sell	54.49	348	18962.52	1,670	75617.96	-3792.50
10/6/2023	VRTX	Sell	371.00	57	21147.00	557	96764.96	-3235.04

The total portfolio value is \$96,764.96 which is down around \$3235.04 since week 1.

5.3 Week 3 (10/16 - 10/22)

Week 3 for the swing trade was followed by a very small gain. However, this gain is the only gain we have seen so far, which may indicate a reversal to a positive trend in our portfolio. The only stock that is yielding a positive unrealized return is VRTX. The rest of the holdings in the swing trade portfolio have lost their initial value. However, KO and NEE seem to be recovering after coming into contact with their support line. The exact reasons for why these stocks went down will never be determined, we can only speculate that they will go up based on a variety of technical factors. See table 5.3 for information about stock purchases and sales.

Table 5.3 A chart of our Week 3 Progress for our Swing Trading Portfolio

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
							96764.96	
10/2/2023	BURL	Buy	118.37	146	17282.02	-	79482.94	-
10/2/2023	DAL	Buy	34.11	538	18351.18	-	61131.76	-
10/2/2023	KO	Buy	53.02	354	18769.08	-	42362.68	-
10/2/2023	NEE	Buy	54.49	348	18962.52	-	23400.16	-
10/2/2023	VRTX	Buy	372.12	57	21210.84	-	2189.32	-
10/6/2023	BURL	Sell	122.1	146	17826.60	544.58	20015.92	-2690.46
10/6/2023	DAL	Sell	32.23	538	17339.74	-1011.44	37355.66	-3701.90
10/6/2023	KO	Sell	54.57	354	19317.78	549.70	56673.44	-3153.20
10/6/2023	NEE	Sell	51.96	348	18082.08	-880.44	74755.52	-4033.64
10/6/2023	VRTX	Sell	361.86	57	20626.02	-584.82	95381.54	-4618.46

Week 3 was followed by another loss of \$1,383.42. This is around 1.38% less than last week's portfolio value of \$96,764.96.

5.4 Week 4 (10/23 - 10/29)

Week 4 was followed by another loss in the swing trade portfolio. We anticipated that since these stocks had hit their support level, that they would go up. This is in accordance with the buy at support level and sell at resistance strategy. It turned out that what is currently happening in the market downturn is having a greater influence on the stocks than the technical factors which we tried to predict. See table 5.4 for information about our stock progress such as purchases and sales.

Table 5.4 A chart of our Week 4 Purchases for our Swing Trading Portfolio

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
							95381.54	
10/2/2023	BURL	Buy	120.34	146	17569.64	-	77811.90	-
10/2/2023	DAL	Buy	32	538	17216	-	60595.90	-
10/2/2023	KO	Buy	54.38	354	19250.52	-	41345.38	-
10/2/2023	NEE	Buy	51.27	348	17841.96	-	23503.42	-
10/2/2023	VRTX	Buy	363.25	57	20705.25	-	2798.17	-
10/6/2023	BURL	Sell	116.43	146	16998.78	-570.86	19796.95	-5189.32
10/6/2023	DAL	Sell	30.65	538	16489.7	-726.3	36286.65	-5915.62
10/6/2023	KO	Sell	55.24	354	19554.96	304.44	55841.61	-5611.18
10/6/2023	NEE	Sell	56.24	348	19571.52	1729.56	75413.13	-3881.62
10/6/2023	VRTX	Sell	355.28	57	20250.96	-454.29	95664.09	-4335.91

The total swing trade portfolio value at the end of week 4 was \$95661, which is around \$300 more than last week's value of \$95380.

5.5 Week 5 (10/30 - 11/05)

Week 5 marks the first week where we have made an unrealized profit. It seems like the stocks reacted late to the reasons why we thought they would go up. Either way, after 4 weeks of losses we can finally say that the portfolio has recovered, at least for now. Although the asset value gain was small compared to where we started, if we compare it to last week it is an almost 10% increase in value. This is a massive jump for only a week timeframe. Please see Table 5.5 for information about each stock sale and each stock purchase.

Table 5.5 A chart of our Week 5 purchases for our Swing Trading Portfolio

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
							95664.09	
10/2/2023	BURL	Buy	118.45	146	17293.70	-	78370.39	-
10/2/2023	DAL	Buy	30.85	538	16597.30	-	61773.09	-
10/2/2023	KO	Buy	55.43	354	19622.22	-	42150.87	-
10/2/2023	NEE	Buy	56.41	348	19630.68	-	22520.19	-
10/2/2023	VRTX	Buy	357.15	57	20357.55	-	2162.64	-
10/6/2023	BURL	Sell	123.46	146	19083.66	1789.96	21246.30	-2545.95
10/6/2023	DAL	Sell	37.00	538	18324.28	1726.98	39570.58	-818.97
10/6/2023	KO	Sell	53.14	354	20078.88	456.66	59649.46	-362.31
10/6/2023	NEE	Sell	50.24	348	19188.72	-441.96	78838.18	-804.27
10/6/2023	VRTX	Sell	373.65	57	21298.05	940.50	100136.23	136.23

The end of week 5 resulted in a total portfolio value of \$100034, which is around \$5000 more than last week's portfolio value of \$95661.

5.6 Week 6 (11/06 - 11/13)

Week 6 (our final week) of the swing trading strategy resulted in a very slight loss. We will consider this loss a break-even because it is a difference of a little more than 1%. The stock market has continued to range, meaning that it has stayed more or less stagnant. As a result, our swing trade portfolio has not changed much. Please see Table 5.6 for information about each stock sale and each stock purchase.

Week 6 was a slight loss of around \$1,700. Our current total portfolio balance is \$98,232 accounting for all assets. Since this is the last week of our swing trading portfolio, we will be no more trades that are submitted. See Figure 5.6 for a screenshot of the status of our Investopedia portfolio.

Table 5.6 A chart of our Week 6 sales for our Swing Trading Portfolio

Date	Symbol	Buy/Sell	Price	Shares	Net Cost/Proceeds	Profit/Loss	Total Cash	Total Profit
							100136.23	
10/2/2023	BURL	Buy	134.88	146	19692.48	-	80443.75	-
10/2/2023	DAL	Buy	36.97	538	19889.86	-	60553.89	-
10/2/2023	KO	Buy	55.91	354	19792.14	-	40761.75	-
10/2/2023	NEE	Buy	56.08	348	19515.84	-	21245.91	-
10/2/2023	VRTX	Buy	373.65	57	21298.05	-	-52.14	-
10/6/2023	BURL	Sell	130.71	146	19083.66	-608.82	19031.52	-472.59
10/6/2023	DAL	Sell	34.06	538	18324.28	-1565.58	37355.8	-2038.17
10/6/2023	KO	Sell	56.72	354	20078.88	286.74	57434.68	-1751.43
10/6/2023	NEE	Sell	55.14	348	19188.72	-327.12	76623.40	-2078.55
10/6/2023	VRTX	Sell	360.62	57	20555.34	-742.71	97178.74	-2821.26

Week 6 was a slight loss of around \$1,700. Our current total portfolio balance is \$98,232 accounting for all assets. Since this is the last week of our swing trading portfolio, we will be no more trades that are submitted. See Figure 5.6 for a screenshot of the status of our Investopedia portfolio.

5.7 Swing Trade Conclusion

The result of the 6-week swing trading strategy is as follows. We started with \$100000 and ended with \$98,232. This was a \$1,768 loss which is 1.7% from the starting value. It seems like the weekend trading strategy that we had hypothesized did not work as intended.

Chapter 6: Results and Analysis

The results of this analysis have been more or less inconsistent with our hypothesis. Our hypothesis was that both of our portfolios, especially our swing trading portfolio, would finish with a profit. However, the reality of the situation was that they both lost around a collective \$6000. What caught us by surprise even more was that our buy-and-hold portfolio lost around four times more money than the swing trading strategy. We expected the opposite to happen in the event of a loss. Since the swing trade portfolio assumed more risk, we expected that the losses for the swing trading strategy would be more severe than our buy-and-hold portfolio.

Since the buy-and-hold strategy assumed less risk, the losses should have been much less. The reason we say this is because the companies chosen in this portfolio had better overall fundamentals than the swing trade portfolio, making it a safer long-term investment. Clearly, that did not turn out to be the case. We believe that the choices we made for buy-and-hold were still good and safe investments if we gave the portfolio more time. Unfortunately, we had only 6 weeks.

We saw a strong consistency between the short-term performance of our stocks and the rest of the stock market. This is not what we expected because we chose each stock for their own unique reasons, so we expected them to have unique results. Our stocks have more or less performed the same overall. There were a few outliers in the portfolios but that is always to be expected. This leads us to believe that predicting stocks in the short term isn't just about choosing a stock that has good fundamentals. It's also about choosing a time in the stock market with bullish sentiments and macroeconomics for shorter term profit goals.

Another thing to note is that our swing trade weekend trades did not turn a profit. These trades (selling right before market close on Friday and buying right after market open on Monday) did not many any improvement in our attempt to make a profit.

What we believe that we could've done to make a higher profit was buy stocks with an even lower PE ratio and RSI. With both indicators combined under more strict conditions, we believe that there would be a higher probability of making a profit. The stocks that we choose from in general had very loose conditions, meaning that we could have done a better job at vetting certain stocks out based on our conditions. This is what we will change going forward.

Chapter 7: Conclusion

This six-week stock simulation took place over the course of A and B terms of the 2023-2024 school year. Overall, this project helped us gain experience with trading and basic knowledge of how the stock market operates. The techniques utilized in this simulation were the buy-and-hold and the swing trading strategies. Using Investopedia, we decided to give each strategy its own portfolio, making it beneficial for comparative analysis. Each portfolio, for both strategies, holds five different chosen stocks from the same corresponding industries. The companies we chose for the stocks were chosen based on extensive research into the company's performance in the past year and how we think their stocks will perform in the current stock market.

After the six-week simulation period, the results were not in line with what we had predicted. We hypothesized that both portfolios would end up with profit, but what ended up happening was that both portfolios lost a collective \$5000, with the buy-and-hold portfolio losing five times more than the swing trading portfolio. Even though our results suggested the swing trading strategy outperformed the buy-and-hold strategy, we conducted the simulation only for six weeks. If given more time, the results could be drastically different.

Overall, this project was a very valuable experience for us. We have gained a lot of knowledge about the stock market and experience with trading. Although the simulation did not go exactly how we wanted, we hope to learn from this experience and use it as a foundation for future financial application.

References

1. Hwang Inyoung. "A Brief History of the Stock Market." SoFi, SoFi, 15 Jun. 2023, www.sofi.com/learn/content/history-of-the-stock-market/.
2. Pettinger, Tejvan, and Sahil Dhawan. "Factors Affecting the Stock Market." Economics Help, 10 Jan. 2018, www.economicshelp.org/blog/2841/economics/factors-affecting-the-stock-market/.
3. Young, Julie. "Market Index: Definition, How Indexing Works, Types, and Examples." Investopedia, Investopedia, 23 July 2023, www.investopedia.com/terms/m/marketindex.asp.
4. Kenton, Will. "S&P 500 Index: What It's for and Why It's Important in Investing." Investopedia, Investopedia, 22 Sept. 2023, www.investopedia.com/terms/s/sp500.asp.
5. Ganti, Akhilesh. "What Is the Dow Jones Industrial Average (DJIA)?" Investopedia, Investopedia, 13 July 17AD, www.investopedia.com/terms/d/djia.asp.
6. Chen, James. "What Does the Nasdaq Composite Index Measure?" Investopedia, Investopedia, 2 Aug. 2023, www.investopedia.com/terms/n/nasdaqcompositeindex.asp#toc-what-is-the-nasdaq-composite-index.
7. Siew, Walden. "Russell 2000 Index Definition and Key Metrics." Investopedia, Investopedia, 3 July 2023, www.investopedia.com/terms/r/russell2000.asp.
8. Anderson, Somer. "What Is an Indicator? How It's Used, Types, and Examples." Investopedia, Investopedia, 21 Apr. 2022, www.investopedia.com/terms/i/indicator.asp.
9. Fernando, Jason. "Relative Strength Index (RSI) Indicator Explained With Formula." Investopedia, Investopedia, 23 Mar. 2023, www.investopedia.com/terms/r/rsi.asp.
10. Hayes, Adam. "Simple Moving Average (SMA): What It Is and the Formula." Investopedia, Investopedia, 30 Sept. 2023, www.investopedia.com/terms/s/sma.asp.

11. Fernando, Jason. "P/E Ratio Definition: Price-to-Earnings Ratio Formula and Examples." Investopedia, Investopedia, 25 Mar. 2023, www.investopedia.com/terms/p/price-earningsratio.asp.
12. Beers, Brian. "What Is Buy and Hold? How the Investing Strategy Works." Investopedia, Investopedia, 13 May 2020, www.investopedia.com/terms/b/buyandhold.asp.
13. Mitchell, Cory. "Swing Trading: Definition and the Pros and Cons for Investors." Investopedia, Investopedia, 29 Sept. 2023, www.investopedia.com/terms/s/swingtrading.asp.
14. "Pfizer." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/Pfizer. Accessed Oct. 2023.
15. "Vertex Pharmaceuticals." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/Vertex_Pharmaceuticals. Accessed Oct. 2023.
16. Hayes, Adam. "Consumables: Definition, Types, and Examples." Investopedia, Investopedia, 31 Dec. 2022, www.investopedia.com/terms/c/consumables.asp#:~:text=Consumables%20refer%20to%20products%20used,goods%20must%20constantly%20be%20repurchased.
17. "The Coca-Cola Company." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/The_Coca-Cola_Company. Accessed Oct. 2023.
18. "Eversource Energy." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/Eversource_Energy. Accessed Oct. 2023.
19. "NextEra Energy." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/NextEra_Energy. Accessed Oct. 2023.
20. "Walmart Inc. (WMT) Stock Price, News, Quote & History." Yahoo! Finance, Yahoo!, finance.yahoo.com/quote/WMT/.

21. "Burlington (Department Store)." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/Burlington_(department_store). Accessed Oct. 2023.
22. "United Airlines." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/United_Airlines. Accessed Oct. 2023.
23. Equity, Zacks. "5 Reasons Why You Should Invest in United Airlines (UAL) Stock." Nasdaq, 4 Jan. 2023, www.nasdaq.com/articles/5-reasons-why-you-should-invest-in-united-airlines-ual-stock.
24. "Delta Air Lines." Wikipedia, Wikimedia Foundation, en.wikipedia.org/wiki/Delta_Air_Lines. Accessed Oct. 2023.
25. Johnson, Jeffrey Neal. "Is Delta Air Lines Stock a Buy?" MarketBeat, MarketBeat, 28 Aug. 2023, www.marketbeat.com/originals/is-delta-airlines-stock-a-buy/.