

CHAPTER 3: Stocks

Did You Know?

In the short term, stock prices are volatile. But over time, the total return on stocks has historically exceeded that of any other class of assets. One dollar invested in stocks in 1802 would have grown to \$8.8 million by 2003, in bonds to \$16,064, in treasury bills to \$4,575, and in gold to \$19.75. Across the board, the average compound after-inflation rate of return on stocks during that period was 6.80% per year, a rate of return that has remained remarkably steady over time.³

What Is Stock?

A **share** of stock is a piece of shared ownership in a business, whether it's a small company with a private group of owners, or a **public** corporation, like Facebook or Nike, with millions of shares available for purchase. Suppose that a company has 10,000 **issued shares** and you own 1,000 of them. This would mean you own 10% of the company as a **shareholder**.

Most people consider purchasing some type of **stock** as part of their long-term investment plans. In simple terms, investors make money by buying stock for one price and selling it for a higher price some time down the road. By selling their stock after it has increased in value, investors earn a **capital gain**. Another way to make money in stocks is when companies pay **dividends**, which are periodic payments made to shareholders, based on a portion of the company's profits.



Career Link

Almost all careers in the financial services industry require strong mathematical skills. Brokers and traders, for example, must be able to quickly calculate prices and analyze market trends, and investment bankers who prepare stocks for public issue must be able to analyze market conditions and determine the price and volume of a stock offering.



³ www.econlib.org/library/Enc/StockMarket.html

Stock Values and Returns



Stock investments can increase in value if a company performs well and its stock price rises. Note that this is not the same as earning cash, until you actually sell the stocks. The idea here is to hold onto the stocks while they continue to increase in value, and sell them either when you need the cash or when you think they've grown as much as they can.

Additionally, when a company earns a profit, it may choose to pay a portion of that amount to its shareholders as a dividend. The total amount to be paid is divided up equally among all the shares and distributed accordingly. So, if a company has issued 100 shares of stock and wants to distribute \$2,000 in profits, the dividend would be \$20 per share. If you owned 10 shares, you would receive a dividend of \$200. Keep in mind that in the real world, a company that pays dividends usually only pays out a percentage of its profits and reinvests the rest in research, development, expansion, and other business-building opportunities.

Your **return on investment (ROI)** for a stock has two parts — the **price return** and the **dividend return**.

- The price return tells you how much the stock has increased or decreased in value since you purchased it, as a percentage of the purchase price. The formula to calculate this is simple:

$$(\text{current stock price} - \text{purchase price}) \div \text{purchase price} = \text{price return}$$

If you purchased a stock for \$100 per share and the current price is \$110 per share, your price return would be 10%.

$$\$110 - \$100 = \$10 \div \$100 = 10\%$$

- The dividend return is a measure of your total dividend earnings since you purchased the stock, as a percentage of the original purchase price. It is also simple to calculate: Add up all of your dividends and divide by the purchase price.

$$\text{total dividends} \div \text{purchase price} = \text{dividend return}$$

For example, let's say you had 10 shares of stock that you bought for \$100 per share, and you received a quarterly dividend (four times per year) of \$1 per share. After one year, your dividend return calculation would look like this:

$$10 \times \$1 \times 4 = \$40 \text{ total dividends} \div (\$100 \times 10) = 4\% \text{ dividend return}$$

- The **total annual return** is a more complete measure, as it takes both of these concepts into consideration. For a one-year period, the formula looks like this:

$$\frac{\text{value of stock based on its year-end price} + \text{dividends received over the year}}{\text{value of stock based on its price at beginning of year}} - 1 = \text{total annual return}$$

For your 10 shares of stock that rose in value from \$100 to \$110 per share and paid \$40 in dividends per year, your total annual return calculation would look like this:

$$\$1,100 + \$40 = \$1,140 \div \$1,000 - 1 = 14\% \text{ total annual return}$$

- You can also calculate the **total return** from the time you purchased the stock. For example, let's say you bought your 10 shares for \$100 per share 5 years ago, and the stock is now worth \$250 per share (giving you an **unrealized gain** of \$1,500). You also received dividends during this time of \$200. Here's the calculation of your total return to date:

$$\$2,500 \text{ current value} + \$200 \text{ dividends} = \$2,700 \div \$1,000 \text{ initial value} - 1 = 17\% \text{ total return}$$

Of course, if the stock price does not do well, your stock can lose value. Let's suppose that your \$100 per share stock is now worth only \$50 per share, and over the past 5 years you have received only \$100 in dividends. The calculation for total return would look like this:

$$\$500 \text{ current value} + \$100 \text{ dividends} = \$600 \div \$1,000 \text{ initial value} - 1 = -40\% \text{ total return}$$

Activity 1

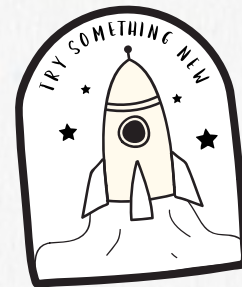
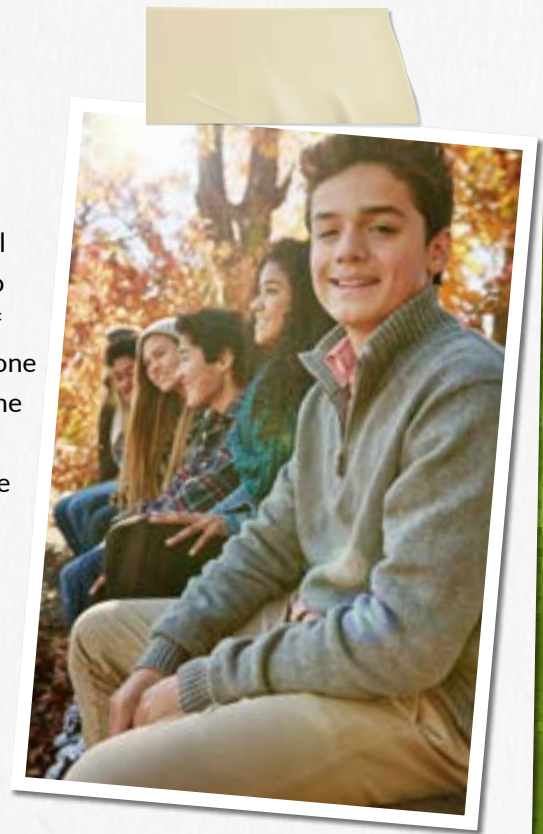
THE BUILDING BLOCKS OF STOCKS

PART 1: SHARED OWNERSHIP

To understand more clearly how stock ownership works, consider the following scenario. You and four friends want to start a lawn and landscape business. You will need to purchase equipment such as mowers, trimmers, and assorted lawn tools to get started. You calculate that it will cost \$1,000 to cover all startup costs. None of you has enough money to start the business on your own, so you agree that everyone will contribute what he or she can by purchasing shares of ownership. You divide the \$1,000 up and decide that there will be 20 shares, each selling for \$50. In order to be part owner of the business, each person will have to purchase a minimum of one share.

This chart shows how many shares each person purchases. Use a calculator to complete the chart, then answer the questions.

Shareholder	Shares Per Person	Percentage of Ownership	Value of Shares
You	5	%	\$
Friend 1	3	%	\$
Friend 2	6	%	\$
Friend 3	4	%	\$
Friend 4	2	%	\$
Total	20	%	\$



1. How did you calculate the percentage of ownership for each shareholder? Describe the mathematical steps for doing this or the formula you used.

2. How did you calculate the value of shares for each shareholder? Describe the mathematical steps for doing this or the formula you used.

3. Which shareholder has the greatest percentage of ownership in the company?

Activity 1

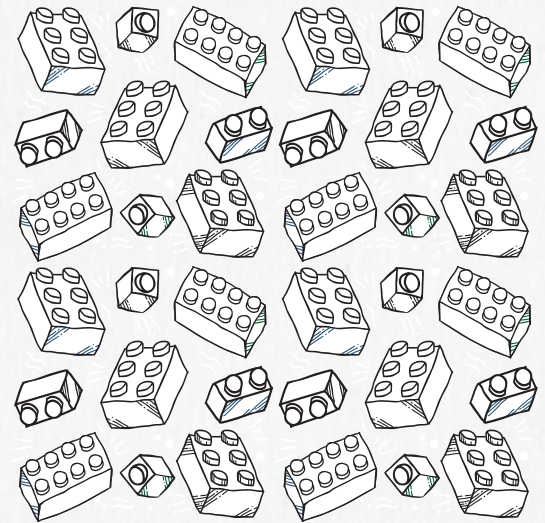
THE BUILDING BLOCKS OF STOCKS

PART 2: EARNINGS AND RETURNS

Your lawn and landscape business is seasonal and operates from April through October. During that time, you had a profit of \$2,000 per month.

1. What are the company's profits for the year? \$_____
2. Would you expect the stock price to go up or down? Why?

Now consider these scenarios:



TRADE 1

At the end of the first year of business, Friend 3 learns that he will be moving out of state and wants to sell his shares. Business is booming and a new person, Friend 5, wants to buy in. She agrees to purchase Friend 3's shares for \$60 each.

1. How much money did Friend 3 lose/gain on his investment? \$_____
2. Based on the year-end stock value of \$60 per share, what is the price return for a share of stock after one year? Use a calculator to find the answer.

Current stock price	- Purchase price	÷ Purchase price	= Price return
\$	- \$	÷ \$	= %

3. What is your stock now worth? \$_____
4. What is your total return after one year? Use a calculator to find the answer.

Current stock value	+ \$0.00 dividends	÷ Initial stock value	- 1	= Total return
\$	+ \$0.00	÷ \$	- 1	= %

TRADE 2

It is now the end of the second year, winter comes early, and some of your clients leave for a competitor. As a result, profits are lower than expected. Friend 2 realizes that he needs some extra cash for an unexpected expense, but no one is willing to pay \$60 per share anymore. You agree to purchase two of Friend 2's shares for \$40 each.

1. How much money did Friend 2 lose/gain on his investment? \$_____
2. Based on the year-end stock value of \$40 per share, what is the price return for the stock from the end of year 1 to the end of year 2? Use a calculator to find the answer.

Current stock price	- Price at end of year 1	÷ Price at end of year 1	= Price return
\$	- \$	÷ \$	= %

3. Who has the greatest percentage of ownership in the company, and how many shares of stock does this person own?

Majority shareholder _____

Activity 1

THE BUILDING BLOCKS OF STOCKS

PART 3: DIVIDENDS

You and your friends have decided that you want to make continuous income on your investment and split the profits. Over time you have developed a list of 15 clients who pay you \$40 per week to mow their lawns. After expenses, the profits equal \$32 per lawn. You decide to reinvest half of the profits back into expanding the business through marketing, purchasing additional equipment, and training staff. The remaining \$16 per lawn you will distribute to the company owners at the end of each week as a stock dividend.

Update this shareholders chart with shares per person and percentages of ownership as they were at the end of Part 2. Then use the chart and a calculator to answer the questions below.



Shareholder	Shares per Person	Percentage of Ownership	Weekly Dividend for 15 lawns at \$16 per lawn	Weekly Dividend for 15 lawns at \$10 per lawn	Weekly Dividend for 20 lawns at \$10 per lawn
You		%	\$	\$	\$
Friend 1		%	\$	\$	\$
Friend 2		%	\$	\$	\$
Friend 4		%	\$	\$	\$
Friend 5		%	\$	\$	\$
Total		%	\$	\$	\$

1. What is the total amount of dividends distributed each week at \$16 per lawn for 15 lawns?
\$ _____
2. Use a calculator to fill in the weekly dividend each shareholder receives in this scenario.
3. Now suppose that profits have decreased to \$25 per lawn and you decide to reinvest 60% of your profits (\$15 per lawn) back into business expansion. What is the total amount of dividends distributed each week in this scenario?
\$ _____
4. Use a calculator to fill in the new weekly dividend each shareholder receives in this scenario.
5. Finally, suppose that the number of clients increases to 20 while profits remain at \$25 per lawn and you still put 60% of your profits back into business expansion. What is the total amount of dividends distributed each week in this scenario?
\$ _____
6. Use a calculator to fill in the new weekly dividend each shareholder receives in this final scenario.

How Are Stocks Bought and Sold?



Most stocks are traded, or bought and sold, through a marketplace called an **exchange**. Some exchanges, like the New York Stock Exchange (NYSE), have a physical trading floor, where **specialists** facilitate the market for specific stocks. The specialist's job is to match up buyers and sellers so that orderly trading takes place and there are no big jumps in the price of the stock from moment to moment.

Other exchanges, like NASDAQ (the National Association of Securities Dealers Automatic Quotation System), complete all of their transactions through a computerized system. Here the market is managed by dealers who have access to buy/sell data on all stocks listed in the exchange, instead of specialists who focus on specific stocks. The process is fairly similar otherwise.

The NYSE and the NASDAQ, both based in New York, are the largest stock exchanges internationally, but there are large and small exchanges all over the world. Companies must meet certain criteria and pay a fee to be listed on each exchange; they typically will choose only one exchange except in special circumstances.

As an individual investor, you do not deal directly with an exchange to buy and sell stocks. Instead, you work through a **stockbroker** at a **securities firm**, or via an **online brokerage**.

Traditionally, a stock purchase proceeds like this:

1. Buyers and sellers call their stockbrokers and ask to make a trade, communicating the amount of money they are willing to spend/accept by indicating a **buy limit order**, **sell limit order**, or **market order**.
2. The stockbroker will issue an order to buy or sell shares of stock to a securities firm's specialist.
3. The specialist sends the order to a **floor broker**, who executes the trade.
4. When the trade is complete, the floor broker sends the final price information to the specialist.
5. The specialist posts the results of the trade in the exchange computer system.
6. The stockbroker phones the investor with details about the final price and number of shares.
7. The investor pays a **transaction cost** or **commission** to the stockbroker for this service.

While many people still use stockbrokers, the popularity of **online trading** has increased dramatically because it is much less expensive and more efficient. Opening an **online brokerage account** is as easy as setting up a bank account: You complete an account application, provide proof of identification, and choose how you want to fund the account. You may fund your account by mailing a check or transferring funds electronically.

For new investors, there are a number of things to consider when choosing an online brokerage:

- **Transaction costs:** This is the fee charged for each purchase/sale, which can range from \$5-\$10 or more. If you trade frequently, or have a limited budget, these costs can add up.
- **Minimum requirement:** The minimum amount of money you have to invest to get started and maintain an account. Many online brokerages have a \$0 minimum requirement to set up a traditional individual retirement account or Roth IRA. For other types of accounts, the minimums can range from \$0 to \$2,000 or more.
- **Other fees:** Some brokerages will charge an inactivity fee if you don't make periodic trades.
- **How much support you want:** Consider the brokerage's offerings of educational tools, investment guidance, stock-trading research, and access to real, live humans via phone, email, online chat, or branch offices.

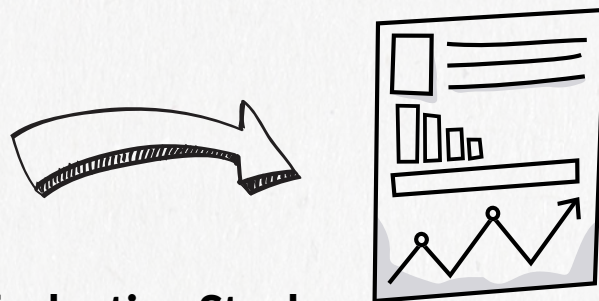


Interpreting Stock Market Data

Major newspapers and many websites contain pages of information about the stock market. To simplify how this information is displayed, each company's stock is assigned a **ticker symbol**. For example, the Ford Motor Company has F as its ticker symbol, while Microsoft is MSFT.

Each day thousands of investors place orders to buy and sell stocks for a particular company, causing almost continual change in the price of the stock. When the exchange opens for trading in the morning, 10,000 shares of a particular company's stock may trade at a price of \$50.00 per share. The next trade in that stock may be for 5,000 shares at a price of \$50.25 per share. The trade after that could be for 25,000 shares at \$49.75 per share. Throughout the trading day, the company's stock will be bought and sold many more times. The low price for the day could be \$48.00 per share and the high price for the day might be \$53.00 per share. You can see that the share price fluctuates, or changes, throughout the day as trades occur. The **last price** for the day could be the low price, high price, or a price somewhere in between the two. Investors often discuss the **market value** of a stock, which is the current price at which investors buy or sell a share of common stock.

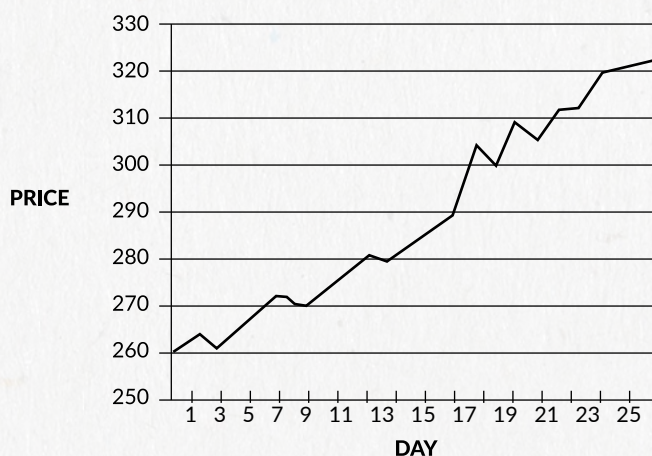
When reviewing daily stock performance in newspapers and online reports, investors can see the last price for the day and compare it to the high and low prices for the day, as well as the last price for the previous day. These prices are shown in increments of one cent. Investors can also see how many shares of the stock were traded, the stock's average price over the past 52 weeks (year), and the stock's **dividend yield**. By studying this information, investors can determine the amount of risk and **volatility** associated with the stock.



Evaluating Stocks

As you learned in the *Did You Know?* section at the start of the chapter, stocks offer a high potential for positive returns. But as with any investment, there are risks involved. The financial outcome for stocks can be uncertain, as market fluctuations are often difficult to predict. This is particularly true in the short-term.

When considering whether to buy a particular stock, one of the first things investors look at is how it has performed over time. Stock prices can fluctuate greatly, but experts try to make predictions based on the **long-term trends** of a company's stock price, in hopes of investing in the ones that will have an **upward trend**.



Stock trends are evaluated by charting the price return of the stock over time. An upward trend means that the stock's price return has a positive average. For example, if you were to study a stock over a three-month period and see an average daily price return of 2.5% during that time, that time period would be referred to as an upward trend.

Examine the stock price trend chart above. Notice that the price changes each day. Some days the price goes up, and some days the price drops. However, if you study its overall change, you will notice that the overall price is higher on Day 23 than it was on Day 1. This is a visual illustration of what an upward trend could look like.

As mentioned in Chapter 1, most investors try to minimize risk by diversifying their portfolio. They will own a number of different stocks in addition to other types of investments. An important thing to look at when considering how to diversify stock investments is the price trends within different industries. It helps to understand the concept of **positive correlation**, which is the tendency of stock prices to move up or down together. For example, if a technology industry expert reports that computer hardware companies are going to make less money than expected, the news is likely to send the prices of all technology stocks down.

On the other hand, there are times when investment performance is **uncorrelated**. For example, if you own stock in a company that produces engines for a specific model of airplane, and its customer decides to discontinue that model, chances are the stock price for the engine-producing company will fall. However, that does not mean the prices for all stocks will fall. In other words, there is no correlation, or connection, between the airplane engine company's stock and other stocks you might own, such as a stock in a pharmaceutical company.

Stock Price Indices

Investors find it very useful to have an overall measure of the stock market's performance. A **stock price index**

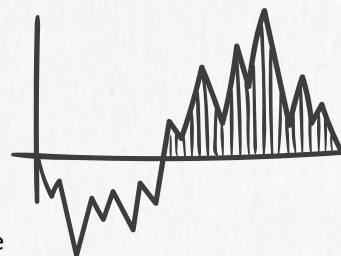
represents the combined price performance of a large number of companies' stocks. There are several different stock market indices commonly used today; you can find them in the business sections of most daily newspapers and on websites that post information about the financial markets.

The oldest and most widely recognized stock price index is the Dow Jones Industrial Average, known as the "Dow" and quoted as DJIA. It is NOT a broad measure of the stock market, as it is based on only 30 "blue chip" stocks. Blue chip stocks are high quality stocks with a reputation for, and solid record of, stable earnings and dividend growth. Most of the Dow stocks are large industrial companies.

The S&P 500 offers a broader measure of stock market performance because it is based on stocks from 500 companies that represent all different economic sectors, not just specific industries. The NASDAQ Composite Index includes over 5,000 companies that are traded on the NASDAQ exchange. Even though this index includes a large number of companies, it is not as broadly representative as one might think, because many of the companies are from the technology sector rather than from a wide range of industries.



Activity 2



TRACKING MARKET TRENDS

Investment analysts and stock experts study market trends and individual stock activity to try and make predictions for how the stocks and the economy as a whole will behave in the future.

Follow the steps below to select stocks from various market sectors and study their performance over a given time period. Use that data to analyze stock trends and answer the questions related to risk and diversification.

1. Select a stock from each of the market sectors listed below, and one from an industry of your choice. Write the name of the stock and its ticker symbol next to the sector. To get started, visit finance.yahoo.com.

SECTOR	COMPANY NAME AND TICKER SYMBOL
Energy	
Finance	
Healthcare	
Technology	
Transportation	
Your Choice	

2. Using data from the past 30 days, create a line graph or chart that illustrates each stock's performance during that 30-day time period. You may do this on a separate sheet of paper, print charts from an internet resource, or create them using spreadsheet software.

3. In the space below, describe the performance of each stock over the 30-day period you tracked. Note things such as price fluctuations and overall gains and losses over the course of the 30 days.

Energy stock: _____

Finance stock: _____

Healthcare stock: _____

Technology stock: _____

Transportation stock: _____

Your choice: _____

4. Choose one of your stocks and compare its performance over the 30-day period to the Dow Jones Industrial Average and the S&P 500.

Stock chosen for comparison: _____

5. Do you see any positive correlation between any of the stocks you selected? If so, explain the positive correlation. If not, explain why the stocks are uncorrelated. _____

6. Of the stocks you analyzed, which appears to be the most risky? Why? _____

7. Which appears to be the least risky? Why? _____

8. Do the six stocks you analyzed seem a good selection for an investor who wants to diversify as a means of reducing risk? Why or why not? _____

Activity 3

PLAYING THE MARKET

Scenario: You have received a \$5,000 inheritance that you must use to purchase stock. You must keep the money in the market for a minimum of one month with the goal of earning as much of a return as you possibly can on your investments.



Using what you have learned about stocks, research and choose a set of one to four stocks to purchase with your \$5,000. You also need to research and choose a method for making your purchases. Over the next 30 days, you will track each stock's activity and hypothetically buy or sell as needed. At the end of the month, study your investment choices and create a chart or graph illustrating the gains and losses on your investments.

Step 1. Determine how you will purchase your stock. Will you use a stockbroker or online brokerage? What firm seems to best fit your needs and budget? Explain why, based on what you learned from researching each option.

Step 2. Using what you have learned about stocks, select one to four stocks to buy. Record your findings about each stock in this chart. Create your own chart based on this template to track your investment decisions over the 30-day period. If you decide to sell a stock, explain why in the "Reason to Sell this Stock" column. If you add new stocks to your portfolio, update your chart accordingly.

Name of Company	Ticker Symbol	Market Sector	Past Performance	Annual Dividend	Reason to Purchase this Stock	Reason to Sell this Stock
				\$		
				\$		
				\$		
				\$		
				\$		

Step 3. How many stocks did you choose? Were they in the same or different industries? Explain whether you chose to diversify and why or why not.

Step 4. Create an investment journal that you can use to track the activity of each stock, and your overall stock portfolio. Keep a daily record of the last price of each stock and its change from day to day. You can use these templates as a guide to get you started. Note that the portfolio template includes space to add new stocks as you sell earlier investments.

STOCK PORTFOLIO						
	Stock 1	Stock 2	Stock 3	Stock 4	Stock 5	Stock 6
Stock Name/Ticker Symbol						
Date of Purchase						
Purchase Price per share						
Number of Shares Purchased						
Transaction Costs						
Date Sold						
Sale Price per share						
Number of Shares Sold						
Transaction Costs						
Profit/Losses						

DAILY STOCK TRACKER										
Company/ Ticker Symbol	Day	1	2	3	4	5	6	7	8	etc.
	Last price									
	Percentage change									
	Last price									
	Percentage change									
	Last price									
	Percentage change									
	Last price									
	Percentage change									
	Last price									
	Percentage change									

Step 5. After 30 days, answer the questions below and be prepared to share your ideas in a class discussion.

1. How many times did you buy/sell during the 30-day period? _____
2. How much did you earn or lose over the course of the month? Be sure to deduct any transaction costs for buying and selling. \$ _____
3. Do you think the stocks you purchased were good investments? Why or why not?

4. Would you choose the same investment strategy if you could re-do the project? Why or why not?

5. What are the advantages of investing in the stock market?

6. What are the disadvantages of investing in the stock market?

7. Do you think you will buy individual stocks in the future based on this experience and what you have learned about investing in the stock market? Why or why not?

