

What is Risk?

Suggested Grade & Mastery Level

High School - all levels

Suggested Time

45- 50 minutes

Teacher Background

Before students can become informed investors, they must understand that every investment carries risk. Each investor must determine his/her risk tolerance—is he/she a conservative, moderate or speculative investor? A number of factors including age and financial stability are important elements in determining a person's risk tolerance.

Conversely, all stocks carry some risk and the more information an investor has about a stock's risk level, the better that investor can determine whether it is compatible with his/her personal risk tolerance.

A stock's beta number is one way investors can estimate the level of a stock's risk. However, it should be stressed to students that no measure of risk or volatility is fool-proof or consistently accurate. The beta—a measure of a stock's volatility—shows of how a particular stock's price moves in relation to the market as a whole. There are betas for individual stock and for industries. A beta number greater than 1 is considered high risk.

A beta of 1 indicates that the stock price should move with the overall market. For example, if a stock's beta is 1 and the market goes up 20%, the stock's price can be expected to go up 20%. If the market is down 10%, the stock may be down 10%. The beta reflects the stock's performance over months, not days.

A beta of more than 1 indicates a stock that is more volatile than the market. For example, if the market goes up 10%, the stock may increase 15%.

In short, the higher the beta, the more volatile the stock; the lower the beta the more stable the stock compared with the market.

Vocabulary

Beta Number: A calculation that helps measure the level of risk in investing in a stock.

Price/Earnings Ratio (also P/E Ratio): The ratio of the stock's price per share to its earnings per share.

Risk: The chance of losing all or part of the value of an investment. Risk can be divided into three categories;

Conservative—fixed income and preferred stocks are considered conservative.

Moderate—include growth stocks—particularly young companies with great potential.

Speculative—stocks that are highly unpredictable. For example, many dot/com stocks are highly speculative, with incredible highs and devastating lows.

Risk Tolerance: An investor's ability to accept loss of some or all of the money he or she has invested, based on a number of factors including age, financial stability, amount of time before the invested funds are needed for other purposes, etc.

Volatile/Volatility: The potential unpredictability or instability of a stock. A volatile stock is a risky stock—one that can go very high, or very low.

Performance Objectives

Students will be able to:

Define and illustrate the three major kinds of risk.

Examine companies and determine the risk involved in investing in these companies.

Research two companies and decide the level of risk their Stock Market Game team would take if they invest in these companies.

Write a persuasive letter motivating or discouraging an investor from purchasing stocks in a company they researched.

Solve decimal multiplication problems.

Subject Areas

Economics, Technology/ Research, English Language Arts (Writing), Mathematics, Business, Social Studies

Materials

Chart Paper

Internet/ Newspaper

Activity Sheet 1: Conservative, Moderate or Speculative?

Activity Sheet 2: To Risk or Not to Risk

Activity Sheet 3: Research Guidelines

Activity Sheet 4: Understanding the Beta Number

Springboard Activity

Jamie wanted advice about the best way to make money on money she received for her birthday.

Her brother told her, "Buy a lottery ticket. It may be risky but you could become a millionaire".

Her grandmother said, "Put it under your mattress and save it for a rainy day."

Her best friend advised her, "Buy stock in Sunoco, gas prices are always in the news".

Her aunt said "Put it in a savings account and you can earn 1% interest a year for the next 20 years.

Ask

Which investment seems the best? What do you think? Why?

Discuss, then have students, as a class, define "risk."

Note: according to [Random House College Dictionary](#), Risk is "exposure to the chance of injury or loss."

Procedure

Ask

How do you think risk applies to investing?

What does Jamie need to learn about investing to make the best decision?

Write the following terms:

Low risk = low return

High risk = high return, low return or loss

Ask

What does this mean?

How does it apply to investing?

Elicit from students the correlation that low risk usually means low profit; high risk may mean high profit or big losses.

Tell students:

Conservative Risk (Low): Means taking limited risk on secure stocks and fixed income investments. Fixed Income stocks are generally low stocks that pay higher than average dividends (4% or higher). A dividend is money paid out to the owner of a stock based on the profit of a company. The value or price of the stock does not change quickly.

Moderate Risk: Growth stocks—stocks that grow faster and higher (value and price) than stocks of other companies with similar sales and earnings—are considered to be of moderate risk.

Speculative Risk (High): Stocks that carry major risks on investments with unpredictable results, but the potential to earn very high returns. When investing in speculative stocks, the investor must realize that while there is a chance of great returns, there is also the possibility for great loss.

Novice Level

Divide the class into their Stock Market Game teams. Have each group rate different investments on *Activity Sheet 1: Conservative, Moderate or Speculative?* Have students share their answers with the class and explain the reasons for their ratings.

Apprentice & Master Levels

Explain that risk is very personal and is based on a variety of elements including: income, age, and financial goals. Different investors can tolerate different levels of risk.

Have each SMG team member evaluate risk taken by each individual on *Activity Sheet 2: To Risk or Not to Risk?* After each team member has evaluated the scenarios on the activity sheet, have team members discuss their evaluations, reach agreement and share the team's decisions with the class.

Grand Master Level

Explain that risk is very personal and is based on a variety of elements including: income, age, and financial goals. Different investors can tolerate different levels of risk.

Have each SMG team member evaluate risk taken by each individual on *Activity Sheet 2: To Risk or Not to Risk?* After each team member has evaluated the scenarios on the activity sheet, have team members discuss their evaluations, reach agreement and share the team's decisions with the class.

Then have each team lower the investment risk for one (or two) individuals from the activity sheet who have high-risk investments by writing a new investment plan that has lower risk.

Assessment

Novice & Apprentice Levels

Have each SMG team, or have students on their own, write a paragraph explaining what type of investors (low, moderate or high risk) they will be and why.

Ask

Will they take high risks?
Will they choose growth stocks?
Why or why not?

Master & Grand Master Levels

Have students, alone or in teams, research three stocks; one conservative risk, one moderate risk, and one speculative risk; and calculate the Beta number for each.

Ask

In which stocks would you feel comfortable investing?
Why?

Application

Novice Level

All SMG teams have been given a virtual \$100,000 to invest in the stock market.

Ask

Given what you know about your own risk tolerance level, how will risk influence your stock picks?
Given what you now know about your teammates' views of risk, might there be conflict in your group over selection of investments? Explain.
How do you think your tolerance for risk might influence your investment strategy if you had a real \$5000 to invest as opposed to a hypothetical \$100,000?

Master & Grand Master Levels

It is important that students understand they should research many different aspects of a company to determine if investing in it is worth the risk.

Ask

If you are going to invest in a company, how can you evaluate the risk level for that investment?

List ideas.

Answers should include:

Growth over past months, years
The overall economy's effect on the company's products or services
The company's new products, mergers, plans for the future
Beta Numbers

Working in SMG teams, have students research two companies in the same industry. *Activity Sheet 3: Research Guidelines* will direct their research.

The students can find all the answers to the activity sheet questions on www.nyse.com or the company's website. If students use www.nyse.com, they should click on search and type in corporation's name.

If students use the company's website (there is a link from the NYSE website) it has information for investors and media. For example, at the bottom of www.mattel.com, click "investors and media" for all information about the stock and products.

Enrichment Activities

Novice Level

Have students write a business letter to a potential investor encouraging her to purchase shares in a particular company. This company can be is high risk, with great potential for success or low risk, providing a more modest, but a steady income.

Apprentice & Master Levels

Student teams plan a comparative presentation based on the two companies they have researched. In this presentation they should note the positive and negative aspects of both companies and explain which company may be the most beneficial to invest in and why. They should discuss risk factors of investing in each company.

Grand Master Level

Have SMG teams complete Activity Sheet 4: Understanding the Beta Number.

Have teams develop a sales pitch to convince an investor to buy stock in one company and not another, based on the companies' risks.

*Work Cited

Mladjenovic, Paul. (2002) *Stock Investing for Dummies*. Indiana: Wiley Publishing, Inc.

Activity Sheet 1 Answer Key: Conservative, Moderate or Speculative?

Decide if the following investments are conservative, moderate or speculative risks.

Investment 1: Company Clockwork makes clocks. Compared with other clock making companies, Company Clock has the highest revenue and earnings, but low profits. Company Clock's earnings have grown 15 percent over the past 5 years. The average earnings of other clock companies, in the past five years, have been at 10 percent. Based on this scenario, if you invested in Company Clock, what type of risk are you taking? Explain.

This is a moderate risk stock because it is growing at a faster rate than other clock

Investment 2: Jax Company provides gas and electric to your area. The stock pays an annual dividend of \$4 per share per year. You own 200 shares, so the company pays you a yearly dividend of \$800. This is a fixed income stock. What type of risk are you taking by investing in Jax Company? Explain

This is a conservative stock because it pays a regular dividend as a fixed income stock.

Investment 3: Watching the news, you learn about a new drug that supposedly makes children smarter. You've never heard of the drug manufacturer, but you decide to invest in this company. Why wouldn't we want our children smarter? If you have no other information and plan to invest in this drug company, what kind of risk are you taking? Explain.

This is a speculative stock because there are not guarantees that the drug will work but it has the potential for high returns.

Investment 4: Interior Electric announces it is creating an all-electric car, but it hasn't come out yet. Based on the news, its stock price has increased 20% in one month. If you buy the stock now, what type of risk are you taking? Explain.

This is still a speculative stock because the car hasn't been built yet but has the potential if it does work and can compete with gasoline fueled automobiles.

Investment 5: ALLON oil company's profits have almost doubled this year. The price of the stock has gone up from \$48 to \$56 over the same period. If you were to invest in this stock, what degree of risk would this investment present? Explain.

This is a growth stock because its price is going up very fast. It is a known commodity for which there is demand now.

Activity Sheet 2: Answer Key

As we've learned, risk tolerance is personal. Based on factors such as age, salary, financial obligations, and family situation, people's risk tolerances vary greatly.

Below are descriptions of individuals who are thinking about investing in the Stock Market. What do you think is the risk tolerance of each one? L=low; M=moderate; H=high

1. Teddy is 26 and has just gotten a new job at a much higher salary. He is single, has no loans and will get a raise within six months. He wants to invest some of his new-found wealth. His risk tolerance is H .
2. Juanita is a single mother with two children, ages 10 and 12. She wants them to go to college and is putting aside money to help pay for their educations. It will be six years before she needs money to help her first child with college. Her risk tolerance is M .
3. Bill is 62. His health is good. His wife has a low paying job, but their children are grown and off on their own. Bill and his wife will retire in three years. Bill's risk tolerance is L .
4. Tasha is 8. Her mother and dad want to start a small investment portfolio for her to use for college or to help buy a home someday. Tasha's risk tolerance is H .
5. Monique and Harrison are in their forties and have three children. They have a mortgage and some credit card bills, but they have put aside a small amount of money to invest for retirement. They hope to retire when they are 65. Their risk tolerance is M .
6. Devon is also in his forties. He has paid for his home, makes a good salary and has no children. He has a good job and wants to invest money so he can buy a condo at the beach in 10 years. His risk tolerance is H .
7. Blair is 20. She is almost finished college. Her parents have paid all of her college costs and have promised to buy a small house for her when she graduates and starts her first job. Blair works on the weekends and during the summer; she has saved several hundred dollars, which she wants to invest. Blair's risk tolerance is M .
8. Sam works in a fast-food restaurant as a cook. He barely makes enough money to pay the rent and buy groceries for his wife and baby. Sam is 35. His grandmother died and left him \$2,000, which Sam wants to invest. Sam's risk tolerance is L .
9. Lisa is 27 and has a good job and few bills. She wants to invest so that in five years she can take a year off to travel in Europe. She has \$5,000 to invest and will need \$25,000 to take the trip of her dreams. Her risk tolerance is H .
10. *Henry is 68 and retired. The company he retired from recently dissolved its pension fund and sent him a check for \$20,000. Henry is very healthy and expects to live at least another 20 years. He gets Social Security and has a small amount of savings. Henry's risk tolerance is L .*

Activity Sheet 3: Answer Key

Answers may vary

Individual Completing Research:

Companies Researched: Toyota & Target

Each member of your Stock Market Game team must research two public companies for in preparation for your team making its stock selections.

TIPS: You will find answers to the questions below on www.nyse.com or the companies' websites. On www.nyse.com, click search and type the company's name. If you go to the company website (follow the link from the NYSE website) to find information for investors and media. For example, at the bottom of www.mattel.com, click on "investors and media" for information about the stock and products.

1. What is the 52-week hi and low?

Company 1: \$1.24/74.79

Company 2: \$59.77/44.70

2. What is the P/E Ratio?

Company 1: This is not available at the NYSE site

Company 2: 16.32

3. What is the current price of the stock?

Company 1: \$101.76

Company 2: \$46.15

4. Explain what the company is and does?

Company 1 Toyota Motor Corporation primarily conducts business in the automotive industry. Toyota also conducts business in the finance and other industries. Its business segments are automotive operations, financial services operations and all other operations. Its automotive operations include the design, manufacture, assembly and sale of passenger cars, recreational and sport utility vehicles, minivans and trucks and related parts and accessories. Toyota's financial services business consists primarily of providing financing to dealers and their customers for the purchase or lease of Toyota vehicles. Its financial services also provide retail leasing through the purchase of lease contracts originated by Toyota dealers Toyota's other operations business segment includes the design and manufacture of prefabricated housing and information technology-related businesses, including certain intelligent transport systems and an e-commerce marketplace called Gazoo.com.

Company 2: Target Corporation (Target) operates large-format general merchandise discount stores in the United States, which include Target and SuperTarget stores. As of January 28, 2006, the Company owned 1,166 stores, leased 77 stores, and operated 154 combined stores for a total of 1,397 locations. As of January 28, 2006, Target's total retail area was 178,260,000 square feet, with 150,318,000 square feet under Target general merchandise stores and 27,942,000 under SuperTarget stores. Target offers an assortment of general merchandise and a more limited assortment of food items in its stores. SuperTarget stores offer a line of food items along with general merchandise. The Company's credit card operation represents an integral component of its core retail business. It offers credit to qualified guests through its REDcard products, including the Target Visa and Target Card. The Company also operates Target.com, an online business.

5. Are there any new products the company plans to make public soon?

Company 1: newer and better alternative fueled vehicles.

Company 2: opening many 29 new stores around the country.

6. What impact does the condition of the economy have on the products and services of this company?

Company 1: The higher the price of gas, the more popular the alternative fuel vehicles will be.

Company2: The higher the price of gas, the more people will want to shop at stores with great values.

7. What type of risk do you think you are taking when you invest in these companies? Why?

Company 1: Moderate because this company is a growth stock because it is investing in many areas and developing new products, but there is the risk of competition form other companies.

Company 2: Moderate because this company is a growth stock because it is opening up many new stores but there is competition with others like Wal-Mart.

8. Based on your research, will you recommend this company to your team for potential investment? Why?

Company 1: Yes I would invest here, because of the potential for suture growth. They are investing in new types of cars as well as new products.

Company 2: This company is a bit more risky because they are opening so many new stores and have a lot of competition. Still they have good advertising.

Activity Sheet 4: Answer Key

The following problems explain how the Beta number reflects the movement of a company's stock compared to the overall market. The S&P 500 Index is composed of 500 major companies; it measures the average increase or decrease over a specific period of time. A Beta of one indicates that the stock's price moves exactly with the overall market. For example, if the market goes up 20%, the stock price goes up 20%. Market goes down 10% stock goes down 10%.

A stock with a Beta of more than one is more volatile than the market. If the market goes up, it tends to go up at a greater magnitude (i.e. market goes up 10%, stock goes up 15%). The higher the Beta number, the more volatile the stock. A Beta of less than one indicates that the stock's price is more stable than the market.

For example, Company A has a beta of .5, the price per share is \$50.00 and the S&P moved -4%. **To calculate how much the stock may change use the following formula**

(S&P X Beta Number) X Cost of Share = Assumed increase/ decrease per share

$(-.04 \times .5) 50.00 = -1.00$

Whereas a company that has a beta of 2.3, price per share \$50.00 and the S&P moved -4%

$(-.04 \times 2.3) 50.00 = -4.60$

Notice the loss is much greater in the second company. If the S&P moved up 4%, the gain would be much greater.

NOTE: This does NOT mean the stock value moved this much on that day. It assumes the stock moved, based on its history and movement within the stock market.

Part 1: For the following problems, calculate the assumed increase or decrease per share.

Company	Beta Number	S&P 500 YTD% Change	Cost per Share	Increase/ Decrease
Computer Week	1.06	-5%	83.00	-4.40
Inter Finder	2.8	+5%	342.00	47.88
Tea Company	.32	-4%	35.00	-.45
Coffee Company	1.1	+4%	37.00	1.63

Part 2: Research 3 companies in which you are interested in investing. Find the beta number, and decide if the risk is worth taking, based on what you know about company. Fill in the following chart.

To find the S&P 500 Index use the following website

<http://money.cnn.com/data/markets/sandp/>

To find the beta number of a stock use the <http://www.NYSE.com> and look up the stock value by finding symbol and typing in symbol where it says 'get quote.'

Company	Beta Number	S&P 500 YTD % Change	Cost per Share	Increase/ Decrease
TGT	.69	3.33	46.15	1.06
ZP	1.64	3.33	.84	.05
DE	1.68	3.33	72.71	4.07

1. Which company is the least volatile? Most volatile?

2. Would you invest in the company that is the most volatile? Why or why not? I would not because it is more expensive than Target...I would invest in Target because you are investing less in a company that is equally as volatile.

Answers may vary on Part 2.