

# Risky Business – Dealing with Uncertainty

**SUBMITTED BY:** Michael Ryan Moore, University of Pennsylvania, GSE

**SUBJECT(S):** Economics, Personal Finance

**GRADE LEVEL(S):** 9, 10, 11, 12

## ≡ OVERVIEW:

This lesson introduces students to the concept of uncertainty and risk. Using the article “What can Risk Management Do for You, Me and Argentina?” students will think about managing uncertainty in the decision-making process. In particular, students will think about their own risk-taking behavior as it applies to a simple game of chance.

## ≡ NBEA STANDARD(S):

- Economics, I. Allocation of Resources
- Personal Finance, I. Personal Decision Making

## ≡ RELATED ARTICLES:

- [“Wharton Insights on the Impact and Implications of Coronavirus”](#)
- [“Raising Llamas: Gustavo Maluéndez’s Path from Pretend Cattleman to Real-life Rancher”](#)

## Common Core Standard(s):

Mathematics (N-Q), “Reason quantitatively and use units to solve problems.”

**Objectives/Purposes:** The purpose of this lesson is to introduce students to *risk* and *uncertainty*.

- Students will be able to define *risk*.
- Students will be able to evaluate multiple mutually exclusive economic choices.
- Students will be able to recognize how *risk* affects individual-level decisions.

**Knowledge@Wharton Article:** [“What can Risk Management Do for You, Me and Argentina?”](#)

### Other Resources/Materials:

For Teachers:

- Internet Access (Outside of the Classroom)
- Printer/Copier
- Access to Chalkboard/Whiteboard
- Chart Paper
- Markers

### Activity:

The lesson is divided into five parts: (1) Introduction, (2) Guided Reading, (3) Class Discussion, (4) Exploration Activity, and finally (5) Closing

#### 1. Introduction (5-10 mins)

Introduce this lesson by referring back to the previous lesson on *opportunity costs*. In particular, ask students to think about where they are right now. Every student in this classroom made a choice today. Each student chose to be in the classroom instead of being somewhere else. Ask students to think about the opportunity cost of being in class today. What was their next best alternative?

Next, broaden the discussion from today’s class to education in general. By a show of hands, ask the students whether they plan to attend college. Ask students to list all of the costs of attending college. (Feel free to write them on the board, e.g. tuition, fees, housing, food, etc.) Afterwards, ask students to think of the opportunity cost of their decision. What is the next best alternative to a college degree?

Have students break into small groups. Give each group a piece of chart paper and some markers. Ask the students to make a list of the costs and benefits of each decision: college + the

next best alternative.

After about 5 minutes, have the students reconvene and share out. Make sure to distinguish between actual costs and opportunity costs. Finally, ask students how confident they are in their lists. How *likely* are the costs? How likely are the benefits? Introduce students to the idea of certainty and risk.

### 3. Guided Reading (5-10 mins)

After this short class discussion, students should read through the first two sections of the article [“What can Risk Management Do for You, Me and Argentina?”](#) As they read, students should think about the relationship between uncertainty and risk.

### 4. Class Discussion (5-10 mins)

Once students have finished, ask them to briefly summarize the article.

After a short class discussion, introduce students to the idea of *risk aversion* and *risk taking*. Ask the students a series of hypothetical questions about a coin-toss game:

Game 1: If the coin lands heads, you win \$1. If the coin lands tails, you lose \$1.

Game 2: If the coin lands heads, you win \$2. If the coin lands tails, you lose \$1.

Game 3: If the coin lands heads, you win \$1. If the coin lands tails, you lose nothing.

Game 4: If the coin lands heads, you win \$100. If the coin lands tails, you lose \$100.

After describing each game, ask students (by show of hands) if they would be willing to play that game. Keep a tally on the board of students' responses.

Compare the total number of players who agreed to play each hypothetical game. Are there differences? Why? Focus in particular on the difference between game 1 and 2, between game 2 and 3, and between game 1 and 4. (More people should be willing to play game two than are willing to play game 1, because there is a higher expected return in game 2. More people will likely choose game 3 over game 2, even though the expected return is the same. This is an example of *loss aversion*. People do not like the idea of losing money, *even if the risk involved is*

*the same.* More people will pick game 1 than game 4, even though the expected return is the same; again this is a loss aversion problem.)

#### 4. Exploration Activity (5-10 mins)

Have the students return to their small groups. With the remaining time, ask students to come up with their own coin flip games to demonstrate the ideas of risk aversion and risk taking behaviors.

#### 5. Closing (1-5 mins)

Remind students of key takeaways: although we often make choices that we think will maximize our utility, we aren't always sure what the outcome will be. Uncertainty leads to risk. Businesses face a variety of risks, and managing risk is complex.

#### ***Tying It All Together:***

##### *Assessment & Extension*

This lesson can easily be extended by incorporating probability and statistics. The coin toss game can be expanded to include dice, or other chance-based outcomes with more complicated solutions.

#### **What Worked and What I Would Do Differently:**

The coin-toss examples in this lesson can be somewhat divisive. This lesson is better suited to students who have some background in probability and calculating expected value. If students do not have this background, it helps to paint broader strokes. In other words, instead of looking at subtle differences in risk, look at extremely large differences. Even without the math background, students have an intuitive understanding of the difference in risk.