Chapter 2
Cost Benefit Analysis and the Value of a Life

Experiment: Description

Handout: Student Instructions

Experiment: Discussion Points

Experiment: Administrator's Guide

End-of-Chapter Solutions

Experiment: The Dictator Game

Description: Students are given a sum of money and asked to offer some of it to an anonymous classmate, who has no power to reject the offer. The student making the offer gets to keep the remainder. This game is juxtaposed against Chapter 1's Ultimatum game in which classmates could reject offers.

Learning Objective and section the activity most strongly supports:

Learning Objective 2.1: Apply cost-benefit analysis to choose among alternative courses of action.

Section 2.1: Cost-Benefit Analysis

Learning goal: Students use cost-benefit analysis to choose how much money to offer a classmate when that classmate has no choice but to accept the offer.

HANDOUT

Student Instructions:

In this game, your instructor will pair you with a classmate. The pairings will be anonymous; no player will know who his or her partner is.

One person in each pair will be designated the "allocator." The other will be designated the "receiver." You will get the chance to play both roles during today's game.

At the beginning of game, the allocator receives $1,000. However, there is a condition: The allocator must offer some of those dollars to the receiver. The allocator may offer as little as 0 or as much as $1,000.

The receiver has no choice but to accept the offer of the allocator. The receiver will earn the amount offered, and the allocator will earn whatever is left over ($1,000 minus the amount offered).

Your instructor will outline the procedures for submitting offers.

Discussion Points

The Dictator Game highlights important concepts from this chapter.

- Playing the Dictator and Ultimatum Games in conjunction shows the importance of good cost–benefit analysis. In the Ultimatum Game, the cost of making a low offer was potentially very high: Receivers could refuse the offer, and nobody would receive anything. As a result, offers were likely to be fairly generous. In the Dictator Game, the cost of making a low offer was much lower: Receivers could not reject low offers. That reduction in cost generally encourages students to make lower offers in the Dictator Game than in the Ultimatum Game. In highly controlled experimental settings, the average offer drops from just under half of the initial amount in the Ultimatum Game down to about 30% in the Dictator Game.
- Oddly, the Dictator Game is one experiment in which the theoretical predictions are at great odds with practical experience. Standard economic theory suggests that there is no compelling reason for allocators to offer the receivers anything. But under carefully controlled conditions, average offers are in the neighborhood of 30 cents on the dollar. Economists have had a hard time explaining this: Why give money to someone you don't know? Especially when the receiver has no idea who it is that is giving him or her money, a fact that virtually precludes any potential for returning the favor? One possible explanation is pure altruism. A second is social pressure: Students may want to appear generous to the only person who knows both who made offers and for how much—the experimentor/teacher.
- The Dictator Game has a lot to do with the issues of precaution we discussed in the chapter. Just as receivers are forced to accept as little or as much money as the dictator was willing to offer, so are people often forced to accept as little or as much precaution as the people around them are willing to take. A person's neighbor may choose to clear the ice from his sidewalk or leave it for others to slip on. If the neighbor doesn't plan on using the walk himself, it may be only his sense of charity that compels him to make his walk safe for others.
- People tend to be, at least in experimental settings, more generous than theory predicts. There is one possible exception: In numerous laboratory replications of the Dictator Game that used college students as experimental subjects, the single best predictor of whether an allocator would make a zero offer to his receiver was if that allocator happened to be an undergraduate economics major.

Administrator's Guide

This experiment is designed to:

- Show students that people respond to incentives in predictable ways.
- Reinforce one of the lessons of the Ultimatum Game: Different people define *fair* in different ways.
- Preview another experiment that you might want your students to play: Altruism or Opportunism: A Variation on the Dictator Game. That experiment appears in Chapter 12.

Administering the Game: There are many different ways to administer this game.

- You can separate the class into two groups, allocators and receivers, and have the allocators write down their offers while the receivers wait in the next room for you to distribute those offers.
- You can coordinate offers after hours by email.

A quicker and easier method is to keep everyone in the classroom and use 3x5 index cards. This method generally yields results similar to those obtained in controlled settings.

To use the index card method, have each student place himself or herself in the role of allocator. On a 3×5 index card that you provide, ask all the allocators to write the following, filling in blanks where appropriate:

"My name is _____, and I offer the receiver _____."

Collect the cards, shuffle them, and place them in a stack.

Next, ask your students to place themselves in the role of receiver. Because the receiver has no choice but to accept the offer of the dictator, on a second 3×5 index card, simply ask all receivers to write their name:

"My name is _____."

Collect these cards, shuffle them, and place them in a stack.

In the first stack, you have offers. In the second, you have the receivers. Draw pairs of cards, one from each stack. Read the name of the allocator and her offer and then read the name of the receiver. Staple the cards together, set them aside, and repeat the process with the next cards in each stack.

If you are teaching a large section, you may wish to skip the in-class announcement of results. In that case, the allocators already know what they will end up with, and you can simply write on the receivers' cards what was offered to them. You can return the cards to the students during a subsequent class period.

When all the pairings have been completed, you may find it useful to calculate the average offer and the most frequently appearing offer.

Based on D. Kahneman, J. Knetsch, and R. Thaler. "Fairness And The Assumptions Of Economics." *The Journal of Business* 59.S4 (1986): S285.

End-of-Chapter Solutions

1.1 marginal

1.2 cost-benefit analysis

1.3 b

1.4 d

1.5 c

1.6 a

1.7 Jessie is basing a decision on sunk costs—her history with Taylor. Instead, Jessie should only look at the costs and benefits going forward: Because Jessie is putting more into the relationship than Taylor is giving back, Jessie should end the relationship.

1.8 The wheat, if harvested, is worth $1,200 (10 acres × 40 bushels per acre × $3 per bushel). It will cost Cecil $1,500 to harvest it. So weighing marginal costs and benefits, Cecil should leave the crop unharvested. Put another way, if Cecil leaves the crop standing, he will lose $5,000 (what it cost to plant the crop only). If he harvests, he will lose $5,300 ($1,200 that the wheat brings in – the $5,000 it cost to plant – the $1,500 it cost to harvest). So Cecil should not harvest.

1.9 It is likely that Nebraska will only consider Nebraskans (such as farmers who would use the water for irrigation, as well as the costs incurred to pump the water) in its cost-benefit analysis, and will ignore any costs it imposes on Kansas. On the other hand, the federal government, which has no preference for Nebraskans over Kansans, will likely weigh both states' interests equally in performing cost-benefit analysis.

2.1 d

2.2 d

2.3 This statement may be true. In each case the party exposing others to risk is doing so for their own gain—you for convenience, Ford for profit. However, this depends on the costs and benefits. If your benefits exceed your costs, while Ford's costs exceed their benefits (or vice versa), then there IS a difference: Your lack of precaution is justified; Ford's is not.

3.1 cost-justified

3.2 c

3.3 d

3.4 a

3.5 d

3.6 d

3.7 c

3.8 Some safety measures work, but save so few lives that requiring everybody to install them is simply not cost-justified. On the other hand, some safety measures are highly effective—they save lots of lives at relatively low cost. Those are the safety measures that should be required.

3.9 Good economics requires a cost-benefit analysis. First, determine how many lives the new standard will save, and assign a monetary value to those lives. Then, determine how much it would cost to bring every water-treatment facility into compliance with the new standard. If the benefits outweigh the costs, then adopt the stricter standard. If they do not, then leave the standard as it is.

3.10 Suppose a family believes (correctly) that it's throwing money away by buying a $60 car seat. If they decide to fight against the law alone, they will likely not be successful (if for no other reason than most other people incorrectly believe that car seats are cost-effective safety measures), and it will cost them far more than $60 to fight car seat legislation. They could, of course, educate and organize their neighbors to fight with them: More voices in the fight make winning more likely. But organizing and educating neighbors is costly—probably more costly than $60. So those costs may prevent anyone from fighting the law.

3.11 School buses are heavy and sit high—when they do get in accidents, the occupants are still relatively safe even without seat belts. Further, they generally drive slowly, and other cars are required to stop when the school bus is dropping off or picking up kids: That reduces the chance of an accident. Third, even if buses did have seat belts, ensuring that children actually use the belts is likely to be time-consuming and difficult. So the benefits of seat belts are small, and may well be outweighed by the costs of installing belts in every bus—including the buses that will never be in an accident.

3.12 Activity with no particular solution.

4.1 b

4.2 b

4.3 b

4.4 Manufacturer's estimated death cost per mower: (1/10,000) × $1 million = $100

Cost of changing design: $80 per mower

Manufacturer's cost-benefit recommendation: Redesign the mower.

True death cost per mower: (1/15,000) x $1 million = $66.67

Cost of changing design: $80 per mower

BSP's cost-benefit recommendation: Do not redesign the mower.

4.5 Manufacturer's estimated death cost per tire: (1/90,000) x $3 million = $33.33

Cost of changing design: $40 per tire

Manufacturer's cost-benefit recommendation: Do not redesign the tire.

If the true value of life is $5 million, then the estimated death cost per tire is (1/90,000) x $5 million = $55.55. Because the cost of changing the design is less than the true death cost per tire, the redesign is cost-justified. The BSP will not approve of the manufacturer's decision not to redesign the tire.

4.6 Activity with no particular solution.

5.1 compensating differential

5.2 lost income

5.3 compensating differential

5.4 a

5.5 Implicit value of life = ($40,000 - $30,000)/(.0005 - .00005) = $22,222,222

5.6 The life of the insurance salesperson will likely be worth more than the life of the nun. First, even though the salesperson isn't very good at her job, she probably still makes more than a nun. Second, she has an extra 20 years of earnings ahead of her. Thus, if both the salesperson and the nun lived, the salesperson would accumulate more earnings over the remainder of her life than the nun. Because the courts use the lost-income method, both of those factors point to the salesperson's life being worth more in the eyes of the court.