

SOLUTION TO HOMEWORK: EXPECTED VALUE

PROBLEM 1:

What is the expected value of a lottery ticket where there is only two chances in a million of winning the grand prize of \$10 Million?

$$EV = \$10,000,000 \times .000002 = \mathbf{\$20}$$

PROBLEM 2:

You have been offered a chance to purchase a lottery ticket with a 1% chance of making \$1,000; 4% chance of making \$100; and 95% chance of making \$0. The price of the ticket is \$15. Should you buy it? Why?

$EV = \$1000 (.01) + \$100 (.04) + \$0 (.95) = \14 ; No! The expected value is less than the price. However, most people do not behave in a rational manner and often pay more than the expected value. Utility theory is used to explain this kind of irrational behavior (beyond scope of this course).

PROBLEM 3:

You have been offered a business deal. You estimate that there is a 1% chance of making \$100,000; 4% chance of making \$40,000; a 20% chance of making \$10,000; and 75% chance of making \$0. How much should you be willing to pay for this deal? Do you think you would actually pay that much? Why or why not?

$$EV = \$100,000 (.01) + \$40,000 (.04) + \$10,000(.20) + \$0 (.75) = \$4600$$

Some people are afraid of risk and some like risk. Thus, there is no single answer this question for everyone.