

Expected Value analysis can apply to any situation where there is a potential monetary gain or loss. Business is a common field where this kind of analysis is regularly performed.

Example 4

It costs \$1000 for Sheri's construction company to bid on a construction project, due to the time involved in preparing the bid. If Sheri submits a bid on a project, there is a one in four chance that she will be awarded (win) the contract. If she is awarded the contract, she will be paid \$3000 for the work.

$$P(\text{win}) = \frac{1}{4}$$

- a) Calculate the expected value of this situation.

$$EV = P(\text{win}) \times \$\text{won} - \text{cost to play}$$

$$EV = P(\text{win}) \times \$\text{(gain)} - P(\text{lose}) \times \$\text{(loss)}$$

$$P(\text{win}) = \frac{1}{4}$$

$$\$(\text{gain}) = 3000 - 1000 = 2000$$

$$EV = \left(\frac{1}{4} \times 2000\right) - \left(\frac{3}{4} \times 1000\right)$$

$$EV = 500 - 750 \Rightarrow -250$$

$$P(\text{lose}) = \frac{3}{4}$$

$$\$(\text{loss}) = 1000$$

There is a net loss of \$250 per bid.

- b) Justify whether she should continue to bid on the contracts of this type, based on the expected value.

Since there is a net loss of \$250 per bid, Sheri should not continue with this bid.

Example 5

Aiko is a travelling salesperson. She drives all around the city every week selling high-end home theatre equipment. Her car costs her \$260 each week for gas, insurance, and lease payment. Each week, there is an 8% chance of her making a sale – her commission on the sale is worth \$3250.

Should Aiko continue selling high-end home theatre equipment in this way? Justify your answer making reference to the expected value of this situation.

$$EV = P(\text{win}) \times \$\text{(gain)} - \text{cost to play}$$

$$EV = (0.08 \times 3250) - 260$$

$$EV = 260 - 260 \Rightarrow 0$$

$$EV = \$0$$

Aiko will not earn any money so she should not continue selling high-end home theatre equipment.

NOTE: Convert 8% to decimal

$$8\% = \frac{8}{100} = 0.08$$

$$P(\text{win}) = 8\% \Rightarrow 0.08$$

$$\$ \text{gain} = 3250$$