History and Basics of Expected Value

Christian Huygens (1629-95)

Dutch mathematician, inventor, physicist, astronomer

Among numerous important contributions, Huygens is credited with developing the concept of**:**
 EXPECTED VALUE

Attended U. of Leiden with Jan Hudde and Jan de Witt, billeting with Frans van Schooten

Huygens credited with first treatise on probability theory: *Van Rekeningh in Spelen van Gluck*. (1657). Frans van Schooten translated the work as *De ratiociniis in ludo aleae* ("On Reasoning in Games of Chance"). Deals with games of chance and solves the important "problem of points".

Example:

Probability (Prob) of Return increase by 20% = .4
Probability (Prob.) of 0% Return = .2
Probability (Prob) of -10% Return = .4
$$E[R] = (.4*.2) + (.2*0) + (.4*-.1) = .04$$

General Case:

$$E[X] = \sum_{s=1}^{S} Prob_s\, X_s \qquad where: \quad \sum_{s=1}^{S} Prob_s = 1$$

where: X_s is the outcome for X in state s; S is the total number of states and s is the counting parameter associated with an individual state