

Handout for Lecture 9

Distribution, Expectation, Variance

ECON 340: Economic Research Methods

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X is a random variable.

- Expectation of X , $\mu_X = E(X) = \sum_x x f(x)$
- Variance of X , $\sigma_X^2 = Var(X) = E[(X - \mu_X)^2] = \sum_x (x - \mu_X)^2 f(x)$
- Standard deviation of X , $\sigma_X = \sqrt{\sigma_X^2}$

If X is a random variable and $Y = a + bX$, then Y is also a random variable with

- $E(Y) = a + bE(X)$
- $Var(Y) = b^2 Var(X)$

You are at a fair and considering playing the following game – flip a coin, if you get heads, you gain \$10, else you lose \$10. Denote X as your winnings/loss from the game.

1. Find the expected value, variance, and standard deviation of X .

