

EE431/438 Economics of Financial Markets and Institutions

Topic 4: Mean-Variance Analysis and the Pricing of Risk

Insurance

- $W_g, W_b = W_g - A$
- $\text{Max } V(W_g, W_b) = \pi U(W_g) + (1 - \pi)U(W_b)$
- Assuming that the price for pure securities are fair. Then, the price of pure security for the good state is equal to π and the price for pure security for the bad is equal to $1 - \pi$.
- The budget constraint: $W = \pi W_g + (1 - \pi)W_b$
- $MRS_{W_b, W_g} = \frac{MU_{W_b}}{MU_{W_g}} = \frac{(1 - \pi)U'(W_b)}{\pi U'(W_g)}$
- The relative price between W_b and W_g is $\frac{\pi}{1 - \pi}$
- At equilibrium, $MRS_{W_b, W_g} = \frac{MU_{W_b}}{MU_{W_g}} = \frac{(1 - \pi)U'(W_b)}{\pi U'(W_g)} = \frac{1 - \pi}{\pi}$. Thus, $\frac{U'(W_b)}{U'(W_g)} = 1$, which implies $W_b = W_g$.
- If the price of the insurance is fair, individuals will choose to insure the same level of wealth regardless of circumstances. In other words, individuals do a full insurance to cover the loss.