

## Today's Topic: Risk Aversion

COEFFICIENT OF ABSOLUTE RISK AVERSION

$$r_A = -u''(x)/u'(x) \quad \text{also known as the Arrow-Pratt coefficient}$$

CP2a.  $u = \sqrt{x} \rightarrow u'(x) = \frac{1}{2}x^{-1/2} \rightarrow u''(x) = -\frac{1}{4}x^{-3/2} \rightarrow r_A = \frac{1}{2x}$

As  $x$  gets larger, the decision-maker would be less risk-averse  
( $r_A$  gets smaller)

CP2b.  $u = \ln x \rightarrow u'(x) = \frac{1}{x} \rightarrow u''(x) = -\frac{1}{x^2} \rightarrow r_A = \frac{1}{x}$

Similar to the previous part!

COEFFICIENT OF RELATIVE RISK AVERSION

$$r_R = -x \cdot u''(x)/u'(x) \quad \text{this measures based on proportion of wealth, as opposed to raw cash value}$$

A nonincreasing  $r_R$  means that an individual becomes less averse to proportional gambles as wealth increases.

CONSTANT ABSOLUTE RISK AVERSION

The CARA utility function is  $u = -e^{-\alpha x}$ , with  $r_A = \alpha$ .

EXPECTED UTILITY FORM

$$U(L) = u_1 p_1 + \dots + u_N p_N$$

von Neumann-Morgenstern EUF

This is cardinal! The magnitude of  $U$  has real meaning.

Allais Paradox: regret theory

Ellsberg Paradox: ambiguity aversion