Lecture II:

Contingent commodities / state space

- alternative approach to choice under uncertainty

- "possible worlds" perspective

- consider n mutually exclusive, exhaustive "states of the world" - one outcome/state

- diagrams: n=2

- gain/loss example: states are

    1. loss occurs - have consumption
    $$C_1 \leq w_1 = w_0 - x_1$$

    2. 2. gain - consumption is $C_2 \leq w_2 = w_0 - x_2$

In state space,

- ordered set $(\bar{C}_1, \bar{C}_2)$ represents pair of possible outcomes

  -once uncertainty resolved, possible states collapse into one realized state

- in diagram: realized consumption on one axis, not interior

Indifference curves in state space?

- all (C_1, C_2) pairs with same EU

- slope? Depends on attitudes towards risk

- as before, p_1 is probability state one occurs

  - given $EU = p_1 U(c_1) + (1 - p_2) U(C_2)$

  - totally differentiate

Along IC,

$$dEU = p_1 U'(c_1) dC_1 + (1 - p_2) U'(C_2) dC_2 = 0$$

Then slope of IC is

$$\frac{dC_2}{dC_1} = -\frac{p_1}{p_2}\frac{U'(C_1)}{U'(C_2)}$$

- interpretation?

Value of slope?

1. where $C_1 = C_2$, (along 45° line) $\frac{dC_2}{dC_1} = -\frac{p_1}{p_2}$

2. otherwise, depends on risk aversion

   a) RN: $U'(C) = k \forall C$ so IC linear

   b) RA: $U''(C) < 0 \forall C$ so IC convex