Justified ?

- Safe minimum standard (SMS)

Uncertainty → Benefit = ∞

Precautionary Principle

Uncertainty
↳ not quantified

Risk ? quantify

Prob (outcome) = x

Prob (not) = 1 - x

Risk neutral

max Expected Value (EV)

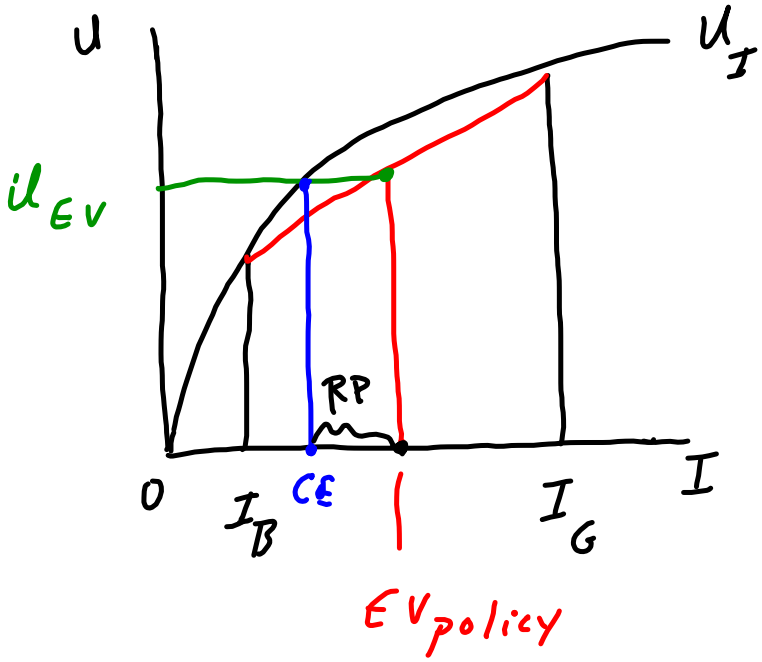
$EV = P_g(\#G) + (1-P_g)(\#B)$

relative size #G vs #B

} Firms Large enough pool.

Risk averse → Loss aversion

diminishing marginal utility of income



$P_g + P_b = 1$

$EV_I = P_g (I_G) + (1 - P_g) \cdot I_B$

EV - red.

$P_g = 0.5$

CE certainty equivalent

RP - risk premium

max WTP to avoid risk

Loss averse

$$EU = p_g(I_G) + (1-p_g)\cdot(I_B \cdot \alpha)$$

$\alpha > 1$

Kahneman
+ Tversky

Rank dependent EU

$$EU = p_g(I_G) + (1-\alpha p_g) I_B$$

$p_g \downarrow \quad p_b \uparrow$

$I_G > I_B$

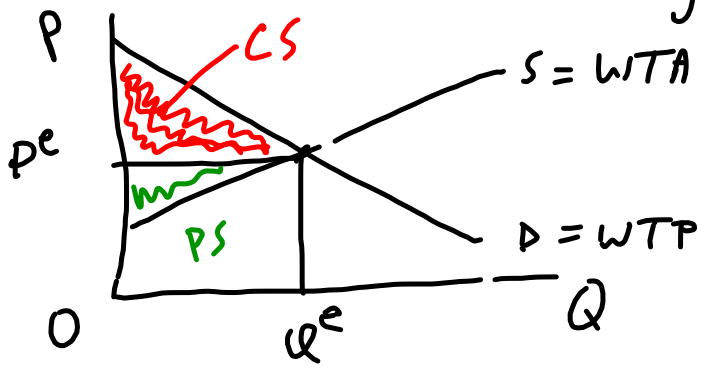
Benefit-Cost Analysis Ch 6

not decision making - informing decision maker

positive analysis - no normative component

value judgement

value of market for a good



↳ CS+PS

- externalities assumed away

Surpluses → utility

aggregate utility → Social welfare

$W = \sum_{i=1}^{N} u_i$ Bentham

if $u_i \uparrow$ & $u_j \downarrow$ so long as $(u_i + u_j) \uparrow$

$W \uparrow$

Bentham { at least one better off &
no one worse off - justified

Hicks H-K compensation criterion
Kaldor if $|\Delta u_i| > |\Delta u_j|$
gainer > loser

transferable utility

Distributional weights

$$W = \sum_{i=1}^{N} \alpha_i u_i$$

α and u negatively correlated

Rawls

$$W = \min_i \{u_i\}$$ - implies $u_i = u_j, \forall i,j$

if W ↑ (subject to H-K)

project → up for consideration

rank competing projects - largest W ↑

(B - C) max difference

- first issue → timing - convert to present value

$$\max NPV = \sum_{t=0}^{T} \frac{(B_t - C_t)}{(1+r)^t}$$

Present value of net benefits

r - discount rate

$\beta_t = 1/(1+r) = (1+r)^{-1}$

value of r ? p119-122 eqn 6.3

r ↑ NPV ↓ Benefits down the road
Costs upfront

r ↓ NPV ↑

correct value of r ?

- components -
  - opportunity cost of spending $1 today ?

rate of growth of economy g
  - value of time δ

η - diminishing utility of money

~~r = n~~

$r = \eta g + \delta \qquad \eta = 1$ no inflation.

r = growth + time discounting

$.02 < r < 0.10 \qquad r \approx 0.05$

g historically ≈ 0.03

$\delta \approx 0.02$