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4 Advertisement

- Few pts.

1. P>MC & product differentiatⁿ ⇒ Ad
2. PD ⇒ Ad or Ad ⇒ Pd ≈ not clear
3. Ads are both good & bad for society.

- informative	- ads are socially wasteful
- gives rise to comp.	- manipulative
- good for the society.	- ↑ higher PD, which hinders comp.

- $\Delta Q (P - MC) > 1$, Ad ↑

  < 1 , Ad ↓

  $= 1$, optimal lvl.

  $\therefore \quad P \Delta Q > |\varepsilon|$, Ad ↑

  $= |\varepsilon|$, optimal

- Ads acts as a signalling device, to try the good atleast once.

12 Decisions under Risk & Uncertainity

- uncertainity is pervasive
- similarity → 1,2,3,4,5,6; H,T
- differences → able to enumerate all the possible outcomes, able to assign P to all possible outcomes $\sum_{i=1}^{n} P_i = 1$

- Probab. → measures risk
⇒ chance that an event will occur —
1. Frequentis / Obj. measure → $n\uparrow$, $P(H)\uparrow$
2. Subj. measure → stock prices
⇒ probab. distribuⁿ → discrete or conti.
⇒ exp. value ($E[x]$ or μ)
⇒ variance ($E[x - E[x]]^2$)

Eg. 1, 2, 3, 4, 5, 6 $\quad E[x] = \sum_{i=1} p_i x_i = \frac{1}{6}(1+2+3+4+5+6)$
$\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$ $\frac{1}{6}$

$= 3.5$

→ higher variance means high risk
⇒ $E(x-\mu)^2 \Rightarrow \frac{1}{6}(1-3.5)^2 + \cdots + \frac{1}{6}(6-3.5)^2$

$= 17.5/6$

Std deviaⁿ ⇒ $\sqrt{var(x)}$

- Coeff. of variaⁿ $= \frac{\sigma}{\mu}$
measure of relative risk

- Decision under risk (3 rules) —
1. max. of expected value
2. mean-variance analysis
(i) $E(A) > E(B)$ & $Var(A) < Var(B) \to A$
(ii) " $= E(B)$ & $Var(A) > Var(B) \to B$
(iii) $Var(A) = Var(B)$ & $E(A) > E(B) \Rightarrow A$
3. coeff. of variant analysis

Eg. A $\rightarrow$ $E(X) = 3500$, $\sigma = 1025$, $v_c = 0.29$
B $\rightarrow$ $\mu = 3750$, $\sigma = 1545$, $v_c = 0.41$
C $\rightarrow$ $\mu = 3500$, $\sigma = 2062$, $v_c = 0.59$

rule 1 $\rightarrow$ B
rule 2 $\rightarrow$ A or B
rule 3 $\rightarrow$ A

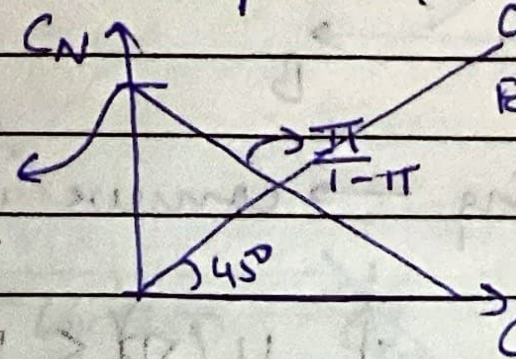
L3 Dec. under risk & uncertainity - 2
- no single rule. Rules do not eliminate risk. We need a framework to include risk in the decision making process.
- State of Nature
- Contingencies :- A contract implemented only when a particular state of Nature occurs is state contingent. Eg. Insurer pay iff. a crop failure.
- Consumer th. $\rightarrow$ U max.
- $(U(C_{i_1}, C_{i_2}, \pi_1, \pi_2)) = \pi_1 C_{i_1} + \pi_2 C_{i_2}$
or $\pi_1 \ln C_{i_1} + \pi_2 \ln C_{i_2}$
$\hookrightarrow$ they are additive as well as separable. State of nature $\rightarrow$ independence assump^n

$$MRS = \frac{dc_2}{dc_1} = -\frac{MU_1}{M_2} = -\frac{\pi_1 U'(c_{i_1})}{\pi_2 U'(c_{i_2})}$$

- A constant expected consump^n line

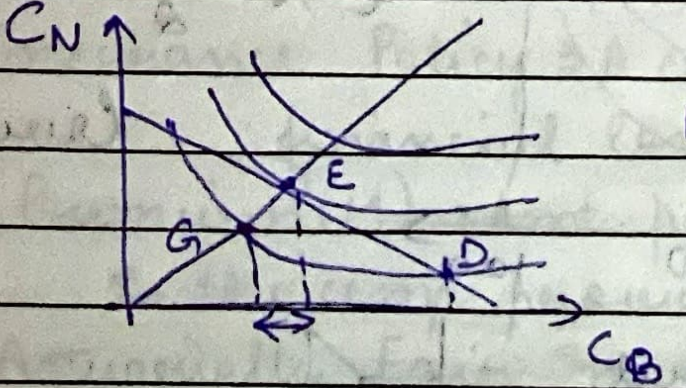
$1 \to N$

$2 \to B$



$$EC_0 = \pi C_B + (1-\pi) C_N$$

$$C_N = \frac{EC_0}{1-\pi} - \frac{\pi C_B}{(1-\pi)}$$



$E \succ G$

$E \succ D$

G is certainity equivalent of D.

$E - G \Rightarrow$ risk peremium

L4 Risk Aversion, Loving, Neutrality

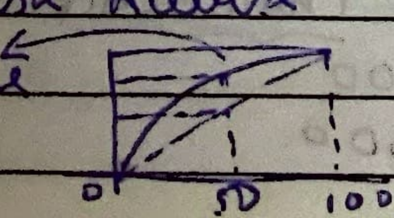
$U[E(a)] > E[U(a)] \to$ risk averse

$U[E(a)] < E[U(a)] \to$ risk loving

otherwise, neutral

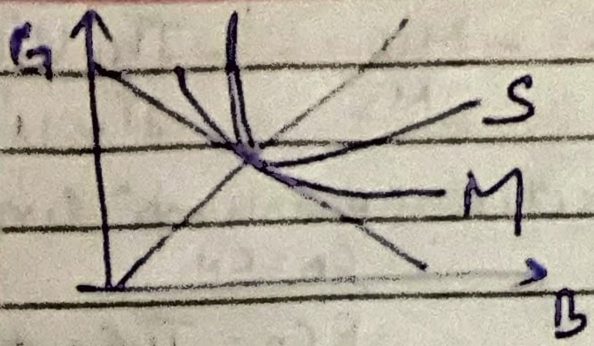
- Risk Averse $\to U' > 0,\ U'' < 0$

concave



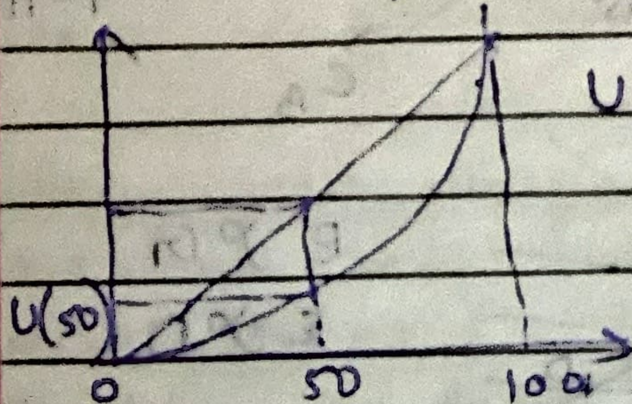
$$U(50) > \frac{1}{2}U(0) + \frac{1}{2}U(100)$$

$MU > 0$, diminishing



S is more risk-averse than M.

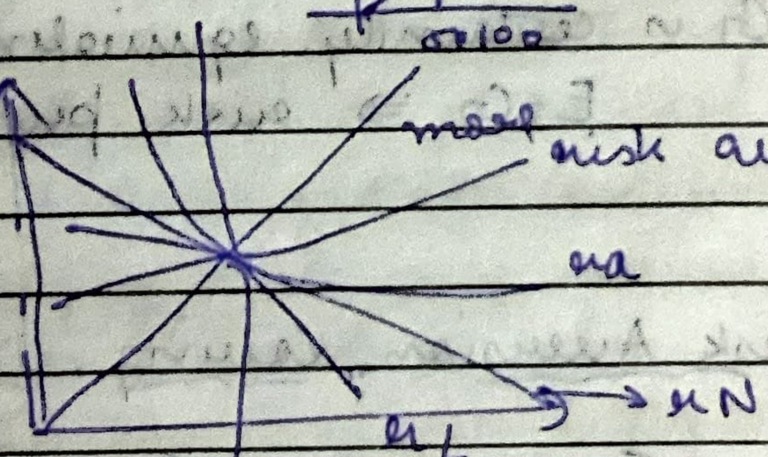
- Risk loving → convex utility func^n



$U(50) < \frac{1}{2}U(0) + \frac{1}{2}U(100)$

Loving

- Risk Neutral



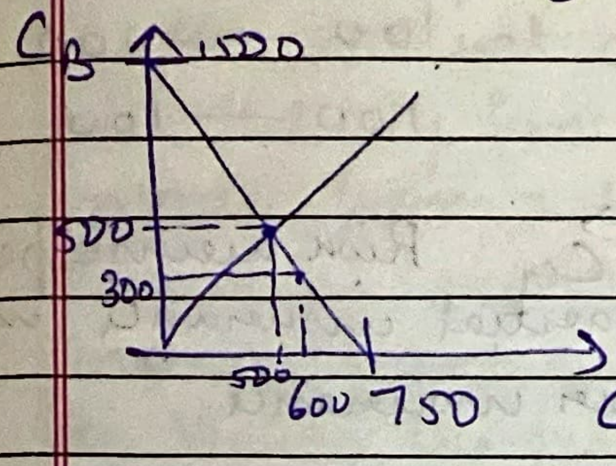
L5 Risk Aversion & Insurance

G — 2/3 (P) — 600

B → 1/3 (P) — 300

$EV = P \times C_G + (1-P) C_B$

$\rightarrow C_B = \frac{EV}{(1-P)} - \frac{P}{(1-P)} C_G$



slope = −2

VI = 1500

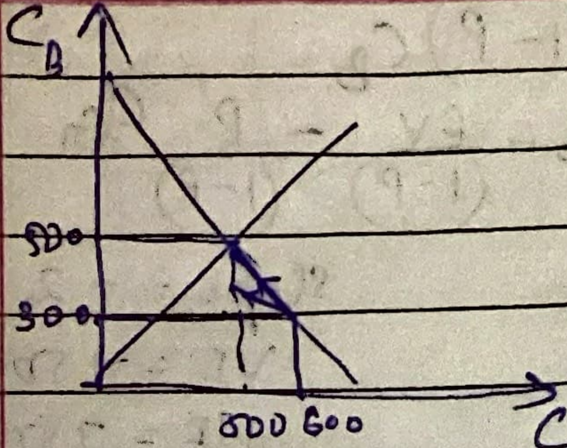
HI = 750

- Insurance Policy ⇒ A construct to reduce financial loss in case of bad.
- Premium (M) → Amt. paid by policy holder to the comp. providing the insurance
- Actuarially Fair Insurance

  $\boxed{M = B(1-P)}$ B → Benefit
- Full insurance - payment from company is equal to the loss.
- Partial Insurance - payment is < loss.
- Demand - Fair Insurance

  Premium = 100 ⇒ L = B

  A risk averse person in case of fair insurance should always go for full insurance & not partial insurance.
- Demand - < Fair Insurance

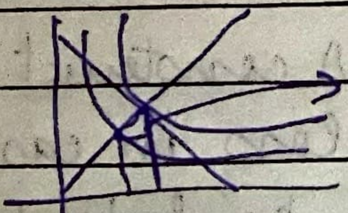


Fair Insurance

100 —— 200

100 —— 100

Risk averse person should go for partial insurance in case of ~~less than~~ fair insurance.



value of insurance

L6: The Market for Insurance

- Risk Pooling → law of large no.

$p = \frac{1}{2}$ | $V(1) = 0.25M$

$V(2) = 0.125$

$V(100) \Rightarrow 0.0025$

₹ 2.5×10^5 ← $\frac{1}{250} = 0.004$ (stolen)

G → 0.996 → 2.5L

B → 0.004 → 0

1,00,000 → 100 million

↓

1000 (M)

$1,00,000 \times 0.004 = 400$ (may get stolen)

$400 \times 2.5L = 100$ million

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- Risk Spreading – There are/have to be some people who are not affected by the natural calamity. Concavity of risk/utility funcⁿ. Taking a little bit of money from a large no. of people incurs less social loss than taking a lot of money from a small no. of people.
Eg. Victim Compensaⁿ fund
- Risk Transfer –

$P \rightarrow \frac{1}{2} \times 100 \rightarrow \frac{1}{2} 36 \quad EU = 9$
$\hookrightarrow 81$
upto 19 certain

$R \rightarrow 100 \times 0'' \quad EU = 9.9982 \rightarrow$ certain
upto 18 $\Rightarrow$ 18.5

L7 Decisions Under Uncertainity
- Maximax, Maximin, Minimax regret, Equal P. criterion

	Nature		
Payoff ~~Decn~~	Normal	Dry	Flood
Usual	5 Cr	−1 Cr	−3 Cr
More F	3 Cr	2 Cr	0.5 Cr
More I	2 Cr	1 Cr	0.75 Cr

- maximax – ⇒ too optimistic
  1. select best outcome of each decision
  2. choose decision that has max. payoff
     → 5 ⟶ 5 cr. (usual)
     → 3 Cons. → too optimistic
     → 2

- maximin – ⇒ too pessimistic (cons)
  1. select worst outcome for each desc.
  2. choose decision that has max. payoff
     → −3
     → 0.5 ⟶ 0.75 cr. (more I)
     → 0.75

minimax regret → potential regret leads to potential improvement if the most appropriate decision was tak
1. fig. out worst regret (pot.) asso. with each decision
2. choose that which mini. the worst pot. regret

	R		R	B	R	
5	0	−1	3	−3	3.75	3.75
3	+2	2	0	0.5	0.25	2
2	+3	1	1	0.75	0	3

more F.

- equal probab.

$\frac{1}{3}$ $\frac{1}{3}$ $\frac{1}{3}$

$\frac{1}{3} \times 5 \quad \frac{1}{3} \times -1 \quad \frac{1}{3} \times -3 = \frac{1}{3} G$

$= 5.5/3\, G$

$= \frac{3.75}{3} G$

more F.