Answers 381

Ans 1(a) ~~False~~. True. There is more scope for bargaining under temporary damages, which also yield an incentive for technological innovation

(b) Uncertain / False. Parties decide to leave efficient gaps if the probability of an adverse event occurring is low <u>or</u> transactions costs are high.

(c) False / Uncertain, promisee then overrelies => please see paradox of compensation

(d) False. No consideration was exchanged

(e) False / Uncertain. The buyer would then have no incentive to undertake the efficient amount of precaution

2 (a) note: wrt = with respect to

2

First, assume that $R_p(b)$ is only realized with probabilities $p(a)$ ~~or~~ and $P(b)$. If either parties default with probabilities $(1-p(a))$ or $(1-p(b))$ Then only ~~$R_p(b)$~~ $R_{np}(b)$ is realized.

Further z is a monetary transfer and thus ignored in a social welfare function.

With these assumptions the social welfare function can be written as

$$W = p(a)\,p(b)\,R_p(b) + (1-p(a))\,(p(b))\,R_{np}(b) + (1-p(b))\,(p(a))\,R_{np}(b) + (1-p(a))(1-p(b))R_{np}(b) - a - b$$

simplifying

$$W = p(a)\,p(b)\,R_p(b) + R_{np}(b)\,(1 - p(a)p(b)) - a - b$$

FOC wrt a $\Rightarrow$ $\underbrace{1}_{\text{marginal expediture}} = \underbrace{p(b)\dfrac{\partial p(a)}{\partial a}\left[R_p(b) - R_{np}(b)\right]}_{\text{marginal expected revenues.}}$

This FOC defines socially optimal $a = a^*$

FOC wrt b

$$1 = p(a)\,p(b)\frac{\partial R_p(b)}{\partial b} + (1-p(a))\,p(b)\frac{\partial R_{np}(b)}{\partial b}$$

marginal reliance expenditure

expected Δ in revenues

possible Δ in revenues

$$+ \frac{\partial p(b)}{\partial b}\,p(a)\underbrace{\Big[R_p(b) - R_{np}(b)\Big]}_{?}$$

This FOC defines socially optimal $b = b^*$

? = what do you think?

b, c, d Here I will only set up privately optimal functions and it is upto you to see if you can back out optimal damages

From the perspective of A, A receives A if she performs and B performs. If only A performs, she incurs costs "a". If B performs and A does not, then

A receives "Z" but pays damages D.
Finally if neither A nor B perform
assume strict liability and A incurs
damages "D"
Therefore A's expected utility function is

$$p(a)p(b)(Z-a) + p(a)(1-p(b))(-a) +$$

$$(1-p(a))p(b)[Z-D) + (1-p(a))(1-p(b))(-D)$$

simplifying we obtain

$$Z\,p(b) - a\,p(a) - D[1-p(a)]$$

FOC wrt a => $$-p(a) - a\frac{\partial p(a)}{\partial a} + \frac{\partial p(a)}{\partial a}D = 0$$

$$\Rightarrow \cancel{p(a)}\; p(a) = \frac{d\,p(a)}{\partial a}(D-a)$$

Can you find a value of D that
equates the socially optimal FOC
with the above one?

(5)

for privately optimal b assume that b only enjoys $R_p(b)$ if both a and b perform. So if both a and b perform then b enjoys R_p at cost b and paying Z to a. If only b performs she obtains R_{np} at cost b and Z. If a performs and b does not then b does not pay A Z and does not expend "b". Finally if neither a nor b perform then b only achieves $R_{np}(b)$. Therefore b's utility function is

$$U(b) = (R_p(b) - Z - b)\,p(a)\,p(b) + (R_{np}(b) - Z - b) \times (p(b))(1-p(a))$$

$$+ R_p(b)(1-p(b))(p(a)) + R_{np}(b)(1-p(a))(1-p(b))$$

Solve with respect to b and compare to socially optimal FOC wrt b.

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Q3 (a) In a competitive market $P = MC \Rightarrow \$70$

$\therefore$ At $P = 100 - Q \Rightarrow Q = 100 - P = 100 - 70 = \underline{\underline{30}}$

(b) π to innovator who sells 30 units at unit cost of $\$70 - x$ at $P = \$70$

$\Rightarrow \pi = 30\,[70 - (70 - x)] = \$\,30x$

$\therefore$ (NV) net value to innovator after deducting innovation costs is

$$NV^m(x, T) = 30x\left[\frac{(1 - .9091^{25})}{(1 - 0.9091)}\right] - 15x^2$$

$\therefore$ maximizing this with respect to x

$$\Rightarrow \frac{\partial NV^m}{\partial x} = 30\left[\frac{(1 - 0.9091^{25})}{(1 - 0.9091)}\right] - 30x = 0$$

$\therefore \Rightarrow \boxed{x \cong 10}$

(c) & (d) solve yourself