

## OPTIONAL READING

Example 4A Table

	$s$	$x$	$t$	$y$	Liability	X's benefit Net of Damages	Y's benefit Net of Damages	$E(D) = stD/(1 + x + y)$	Net Social Benefit
1	0.058547	0.355473	0.058547	0.355473	All Y	0.22115	0.12098	0.1001705	0.34213
2	<b>1.978454</b>	<b>0.355473</b>	0.058547	0.355473	All Y	0.70329	-3.16388	3.3850318	-2.46059
3	1.978454	0.355473	<b>0.000728</b>	<b>8.590517</b>	All Y	0.70329	0.01349	0.0072366	0.71677
4	<b>17374.63</b>	<b>0.000000</b>	0.000728	8.590517	All X	65.9064	0.0207	65.906433	65.92716
5	17374.63	0.000000	<b>1000000</b>	<b>0.000000</b>	All X	-8.69E+11	1000.000	8.69E+11	-8.69E+11
6	<b>1.978454</b>	<b>0.355473</b>	1000000	0.000000	All Y	0.70329	-72979204	72980204	-7.30E+07
7	1.978454	0.355473	<b>0.000728</b>	<b>8.590517</b>	All Y	0.70329	0.013487	0.0072366	0.71677
8	1000000	0.000000	0.000000	0.000000	All X	1000.000	0.00000	0.0000000	1000.000
9	0.000000	0.000000	1000000	0.000000	All X	0.00000	1000.000	0.0000000	1000.000

Notes:

X is liable if and only if  $x < x^*$ .

Constraint:  $s, t \leq 1,000,000$ .

Line 1 solves first order conditions to get  $(s^*, x^*, t^*, y^*)$ .

Line 2: X chooses  $s$  and  $x$ . He chooses to keep  $x$  at  $x^*$ , and increase  $s$  to 1.978.

Line 3: Y chooses  $t$  and  $y$ . FOC's give interior solution:  $t = .000728$  and  $y = 8.5905$ .

Line 4: X chooses  $s$  and  $x$ . FOC implies negative  $x$ , so  $x = 0$  is used. FOC implies  $s = 17374.6$ .

Line 5: Y chooses  $t$  and  $y$ . Since  $x = 0$ , X pays damages; therefore Y sets  $y = 0$ , and wants  $t$  large.

Line 6: X chooses  $s$  and  $x$ . He must choose  $x = 0.355473$  to escape huge damages. FOC gives  $s = 1.978$ .

Line 7: Y chooses  $t$  and  $y$ . Back to line 3! Cycle!

Lines 8 and 9: Two ways to get very high NSB's.