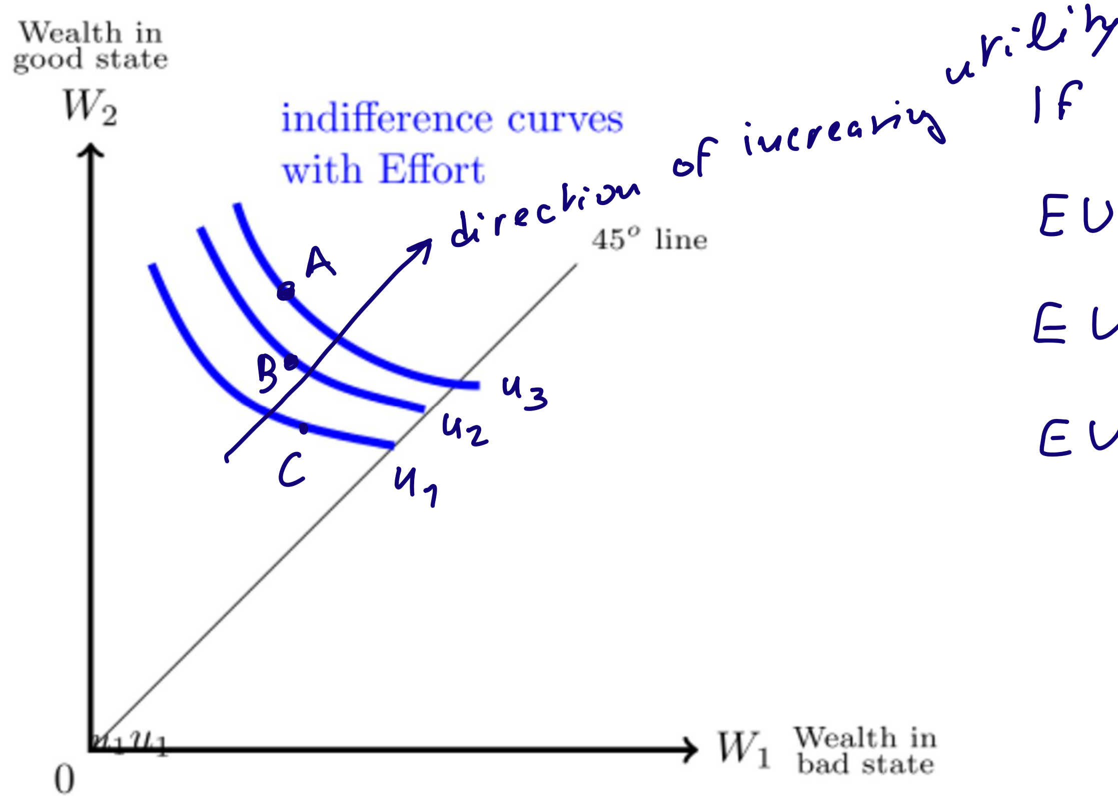
Through any point in the wealth space go **two** indifference curves: a less steep one corresponding to effort and a steeper one corresponding to no effort.

No-effort indifference curves:



$u_3 > u_2 > u_1$

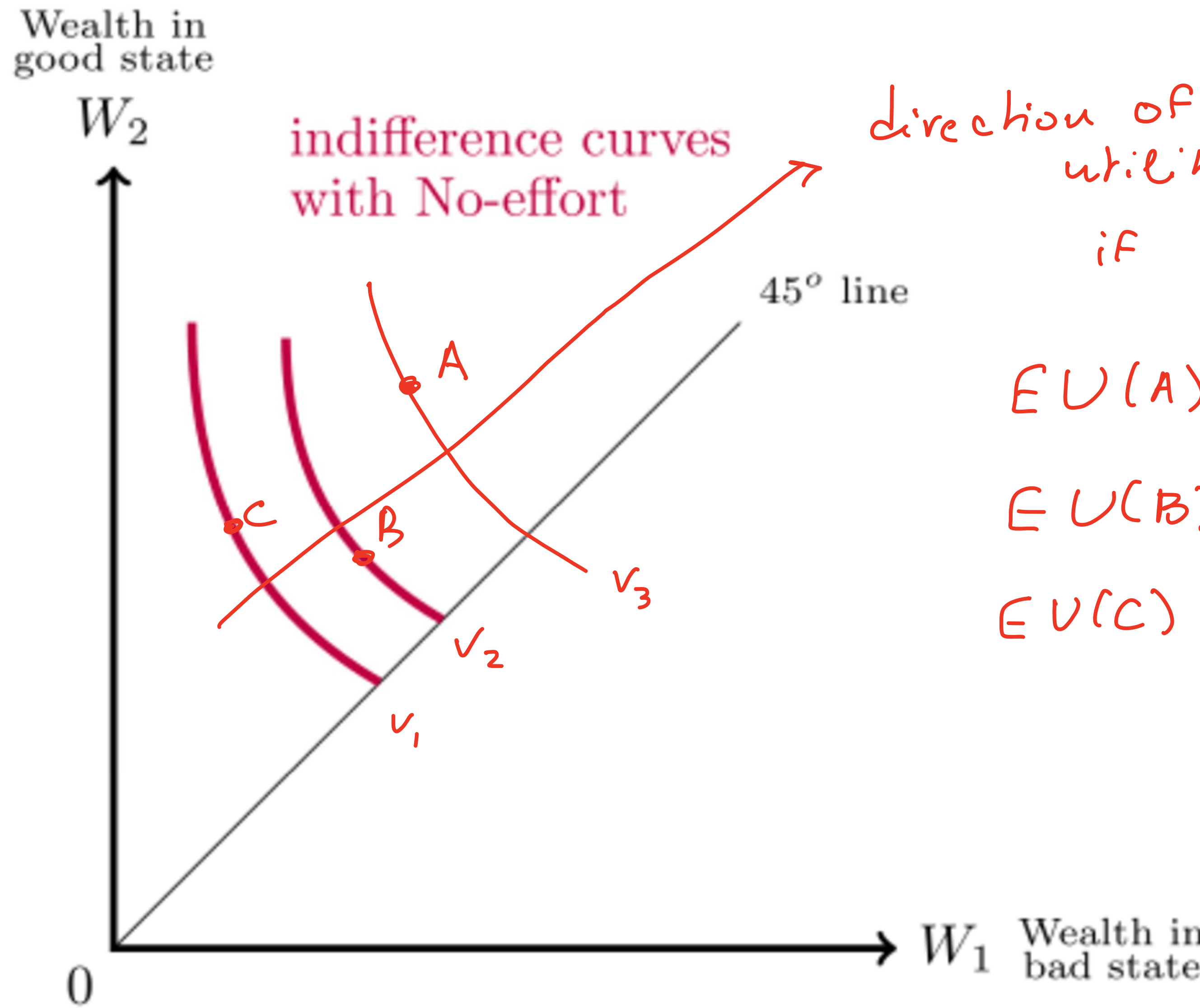
If exert effort

$EU(A) = u_3$

$EU(B) = u_2$

$EU(C) = u_1$

Next the no-effort indifference curves:



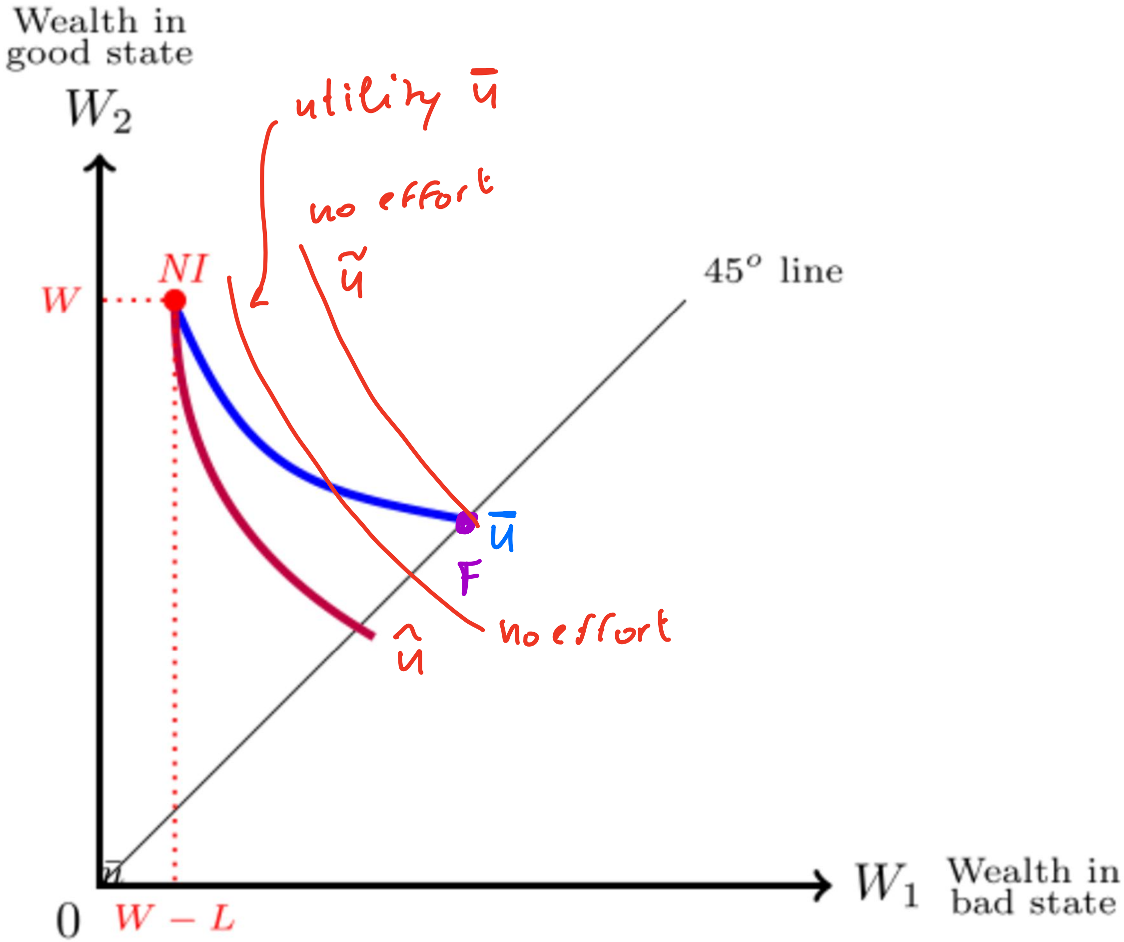
direction of increasing utility $V_3 > V_2 > V_1$ if no effort

$EU(A) = V_3$

$EU(B) = V_2$

$EU(C) = V_1$

Indifference curves that go through the NI point:

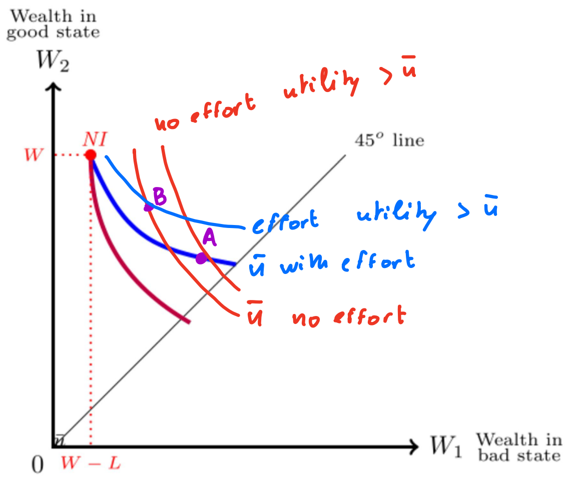


Assume that $\boxed{\bar{u} > \hat{u}}$

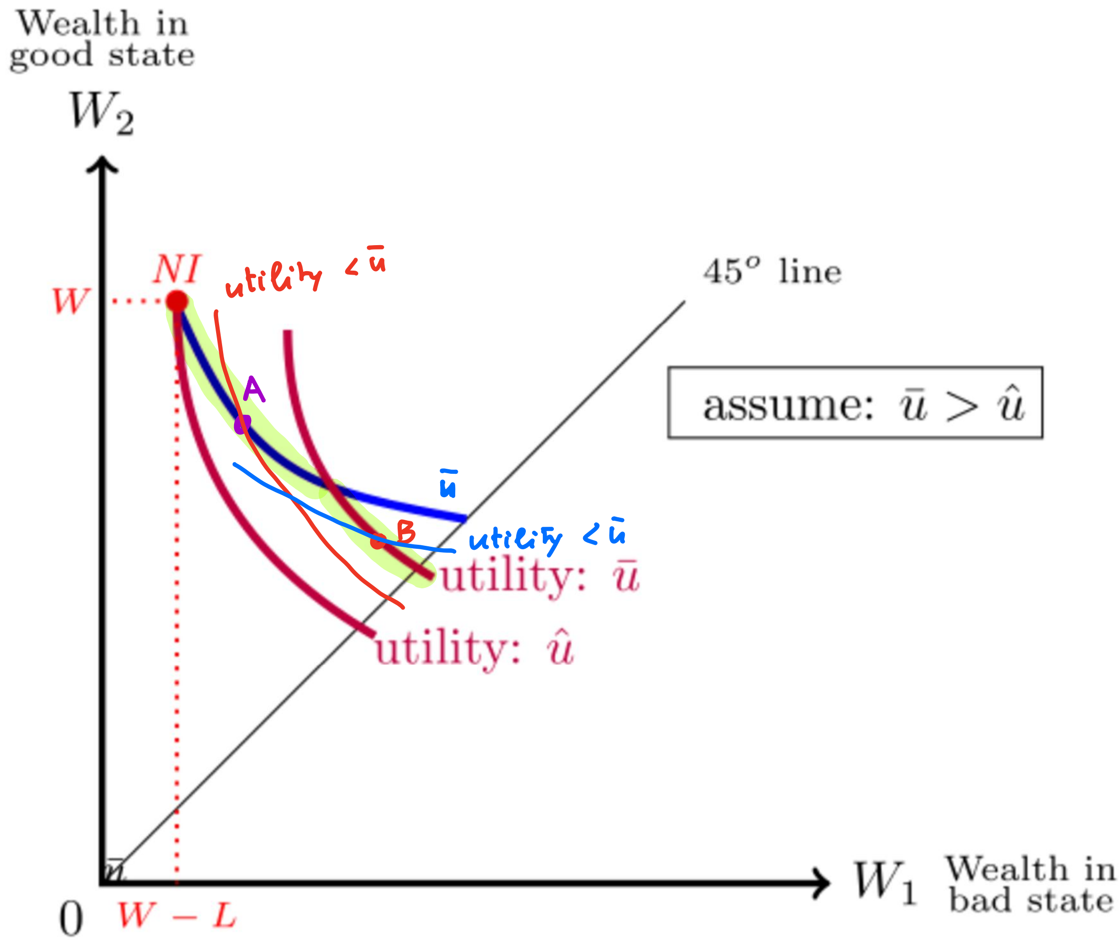
under NI agent chooses effort

$\tilde{u} > \bar{u}$

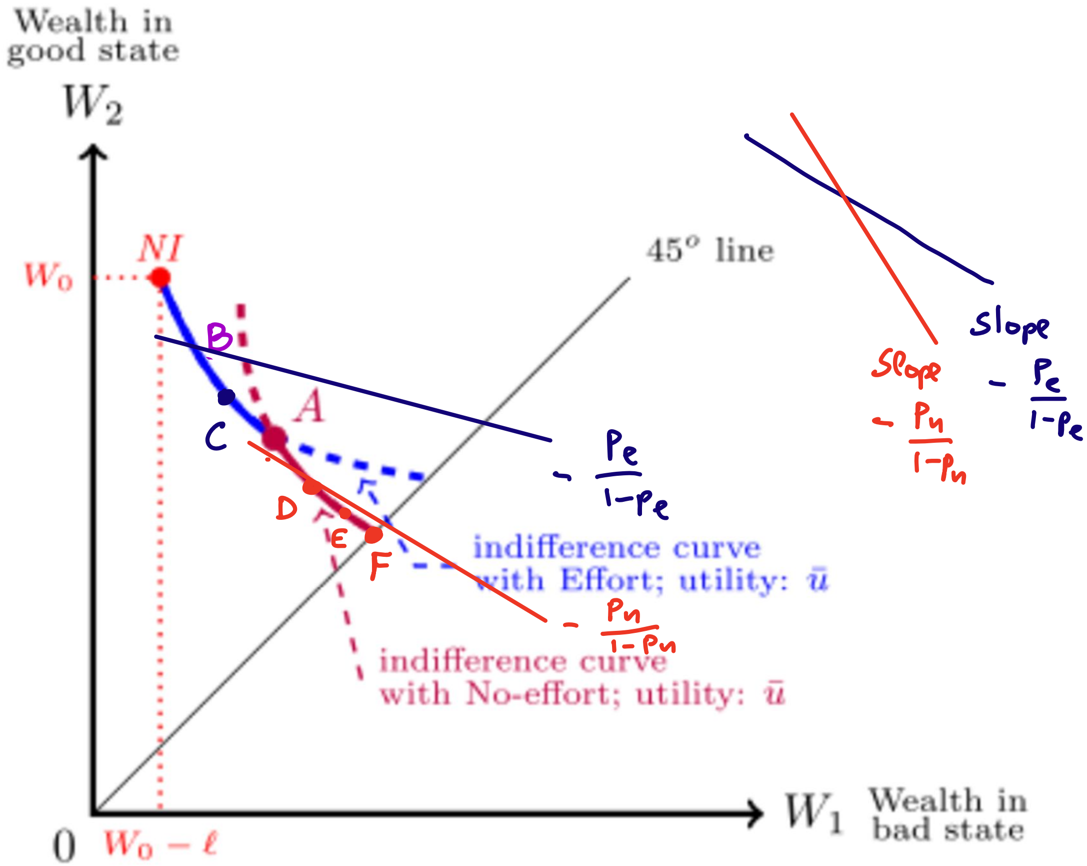
$\bar{u}$ is the reservation level of utility



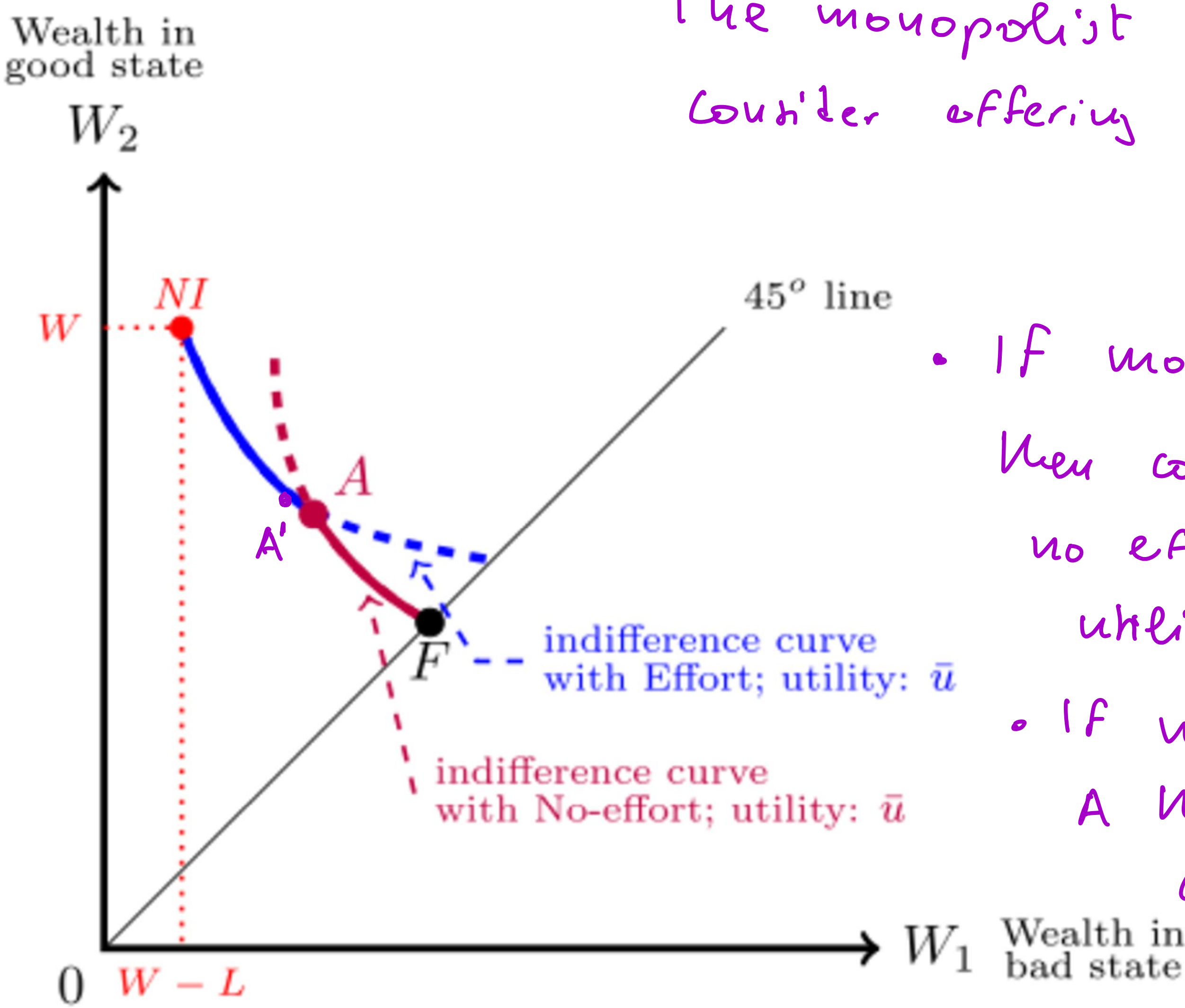
Wealth in good state
W_2
W
NI
no effort utility > $\bar{u}$
45^o line
B
A
effort utility > $\bar{u}$
$\bar{u}$ with effort
$\bar{u}$ no effort
0
$W - L$
W_1
Wealth in bad state



Wealth in good state
W_2
NI
W
utility < $\bar{u}$
A
$\bar{u}$
B
utility < $\bar{u}$
45^o line
assume: $\bar{u} > \hat{u}$
utility: $\bar{u}$
utility: $\hat{u}$
0
$W - L$
W_1
Wealth in bad state



The monopolist will want the consumer to be on the **reservation utility locus**. But which contract on this locus will it offer?



The monopolist will only consider offering either A or F

- If monopolist offers F then consumer chooses no effort and gets utility $\bar{u}$
- If monopolist offers A then consumer chooses effort and gets utility $\bar{u}$

Cost of effort is a psychological cost

TWO EXAMPLES

Example 1.

$W = 10,000 \qquad L = 1,900 \qquad p_n = \frac{4}{10} \qquad p_e = \frac{1}{10}$

$$U_n(m) \equiv U(m,0) = \sqrt{m}$$

$$U_e(m) \equiv U(m,e) = \sqrt{m} - 1$$

$c = 1$

c

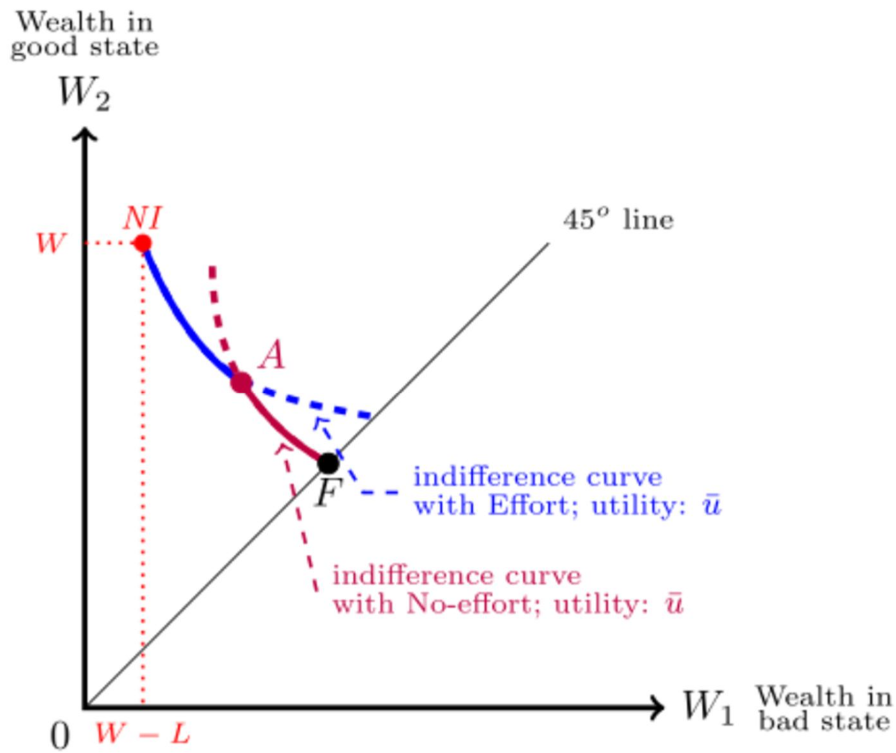
Then

$$\mathbb{E}[U_n(NI)] = \frac{4}{10}\sqrt{10,000 - 1,900} + \frac{6}{10}\sqrt{10,000} = 96 \Big\} \hat{u}$$

$$\mathbb{E}[U_e(NI)] = \frac{1}{10}\left(\sqrt{10,000-1,900} - 1\right) + \frac{9}{10}\left(\sqrt{10,000} - 1\right) = \underbrace{98}_{\bar{u}}$$

So under no insurance the agent chooses effort

What contract would a monopolist offer? The choice is between A and F.



$F = (h_F, d_F = 0)$

Find the premium of contract F. Given by the solution to:

$$\sqrt{10{,}000 - h} = 98 \qquad h_F = 396$$

Corresponding profits:

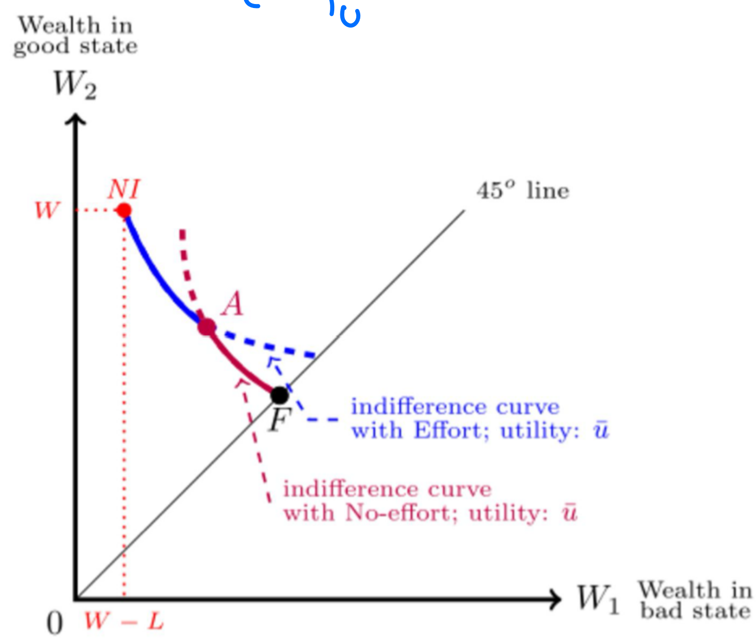
$$\pi(F) = 396 - \frac{4}{10}(1{,}900) = -364$$

Calculate premium and deductible for contract A: $A = (h_A, d_A)$ $d_A > 0$

$\frac{4}{10}\sqrt{10{,}000 - h_A - d_A} + \frac{6}{10}\sqrt{10{,}000 - h_A} \approx 98$ (on the no-effort indifference curve for utility 98) $p_n = \frac{4}{10}$

$\frac{1}{10}\left(\sqrt{10{,}000 - h_A - d_A} - 1\right) + \frac{9}{10}\left(\sqrt{10{,}000 - h_A} - 1\right) \approx 98$ (on the effort indifference curve for utility 98) $p_e = \frac{1}{10}$

The solution is: $h_A = 132.89$ $d_A = 651.11$



Corresponding profits:

$\Pi(A) = 132.89 - \frac{1}{10}(1{,}900 - 651.11) = 8$

Thus the monopolist will offer

Example 2 ("effort" is a monetary expense)**.**

$W = 8{,}000 \qquad L = 3{,}000 \qquad p_n = \frac{1}{8} \qquad p_e = \frac{1}{10} \qquad U(m) \equiv 10\ln(m)$

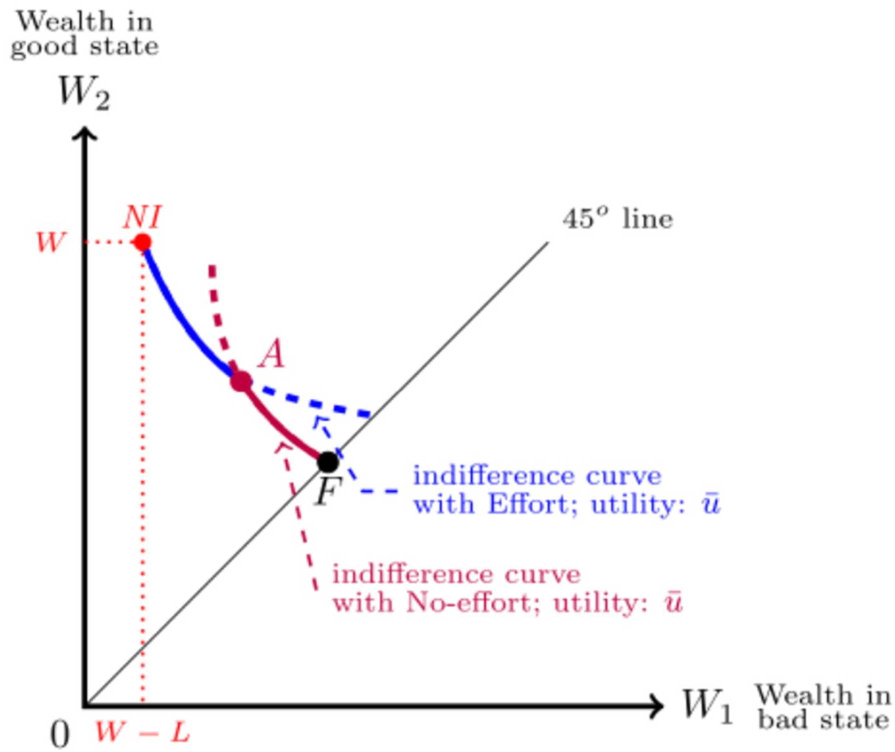
Cost of "effort": $50.

$$\mathbb{E}[U_n(NI)] = \frac{1}{8}\,10\ln(8{,}000-3{,}000) + \frac{7}{8}\,10\ln(8{,}000) = \overbrace{89.284}^{\hat{u}}$$

$$\mathbb{E}[U_e(NI)] = \frac{1}{10}\,10\ln(8{,}000-3{,}000-50) + \frac{9}{10}\,10\ln(8{,}000-50) = \underbrace{89.335}_{\bar{u}}$$

So under no insurance the agent chooses effort

What contract would a monopolist offer? The choice is between A and F:



Find the premium of contract F. Given by the solution to:

$$10 \ln(8{,}000 - h) = 89.335 \qquad h_F = 417.87$$

Corresponding profits:

$$\pi(F) = 417.87 - \frac{1}{8}(3{,}000) = 42.87$$

Calculate premium and deductible of contract A.

Given by the solution to:

$$\frac{7}{8} 10 \ln(8{,}000 - h_A) + \frac{1}{8} 10 \ln(8{,}000 - h_A - d_A) = 89.335$$

(on the no-effort indifference curve for utility 89.335)

$$\frac{9}{10} 10 \ln(8{,}000 - h_A - 50) + \frac{1}{10} 10 \ln(8{,}000 - h_A - d_A - 50) = 89.335$$

(on the effort indifference curve for utility 89.335)

The solution is: $h_A = 163.69$ $\quad d_A = 1{,}817.05$

Corresponding profits:

$$\pi(A) = 163.69 - \frac{1}{10}(3{,}000 - 1{,}817.05) = 45.395$$

So $\pi(A) > \pi(F)$ and the monopolist will offer the partial-insurance contract A