Damages and Efficiency with Ex-post Renegotiations

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ED and Ex-post negotiations I

(Rogerson 1984, RJE)
We assume that

- whenever ex-post negotiations take place, the Buyer gets α fraction of the *resulting* surplus,
- $\alpha \in [0, 1]$. α is exogenously given.

Under Expectation Damages

- in the absence of ex-post negotiations, the breach set $BS^{ED}(r) = \{C|C > V(r)\}$, i.e.,$BS^{ED}(r) = BS^{*}(r)$. Therefore,
- there cannot be Pareto improving negotiations.
- As a result, the breach set remains $BS^{ED}(r) = \{C|C > V(r)\}$.

ED and Ex-post negotiations II

Buyer, as before, chooses r that maximizes

$$F(V(r))[V(r) - P] + (1 - F(V(r)))[V(r) - P] - r, \ i.e.,$$

$$V(r) - P - r, \ i.e.,$$

the r^{ED} opted by the Buyer, solves

$$V'(r) - 1 = 0. \tag{1}$$

RD and Ex-post negotiations I

Under Reliance Damages, in the absence of ex-post negotiations

- the breach set $BS^{RD}(r) = \{C | C > P + r\}$, i.e., not Pareto efficient;
- when $V(r) > C > P + r$ holds, the parties can profitably re-negotiate the contract.

Question

- *When $V(r) > C > P + r$, what is the surplus from renegotiations?*
- *When $C > V(r)$ or $C < P + r$ holds, can there be Pareto improving negotiations?*

Therefore, the breach set becomes

$$BS^{RD}(r) = \{C | C > V(r)\}.$$

The Buyer chooses r that maximizes

RD and Ex-post negotiations II

$$\int_0^{P+r}[V(r)-P]dF(C)+\alpha[\int_{P+r}^{V(r)}[V(r)-C]dF(C)]+\int_{P+r}^{\bar{C}} rdF(C)-r, \; i.e.,$$

$$\int_0^{P+r}[V(r)-P-r]dF(C)+\alpha[\int_{P+r}^{V(r)}[V(r)-C]dF(C)], \; i.e.,$$

$$\begin{aligned}(1-\alpha)\int_0^{P+r}[V(r)-P-r]dF(C) \; &+ \; \alpha\int_0^{P+r}[V(r)-P-r]dF(C) \\ &+ \; \alpha[\int_{P+r}^{V(r)}[V(r)-C]dF(C)].\end{aligned}$$

Rewriting the last two terms, we get

RD and Ex-post negotiations III

$$(1-\alpha)\int_0^{P+r}[V(r)-P-r]dF(C)+\alpha\int_0^{V(r)} min\left\{\begin{array}{l} V(r)-P-r; \\ V(r)-C \end{array}\right\} dF(C). \quad (2)$$

When $\alpha = 0$ the r opted by the Buyer, solves

$$V'(r) - 1 = -\frac{f(P+r)[V(r)-P-r]}{F(P+r)}, i.e., \quad (3)$$

$r^{RD}(\alpha = 0)$ opted by the Buyer is the same as in the case of no renegotiations.

Now, from (2) note that the following holds:

- for all $r \leq r^{ED}$, $V(r) - r \leq V(r^{ED}) - r^{ED}$
- $V(r)$ and $V(r) - r$ both increase with r

RD and Ex-post negotiations IV

- the area of integral increases with r

Therefore, both the terms in (2) and hence their sum will attain a maxima at $r \geq r^{ED}$, i.e., for all $\alpha \in [0, 1]$, $r^{RD}(\alpha) \geq r^{ED}$.

It can be shown that for all $\alpha \in [0, 1]$,

$$r^{RD}(\alpha = 0) \geq r^{RD}(\alpha) \geq r^{ED}.$$

Ex-post negotiations and Relative Efficiency I

Proposition

In the presence of ex-post negotiations, Expectation damages are K-H superior to Reliance damages

Proof: Consider an arbitrary contract under Reliance damages, say $(D(r), P) = (r, P)$; where P is the agreed price.

Suppose, under this contract the outcome is (BS^{RD}, r^{RD}). We know that for all

$$\alpha \in [0, 1],\ r^{RD}(\alpha) \geq r^{ED}.$$

Also, for any given r,

$$\begin{aligned} Z(r, BS^*(r)) &\geq Z(r, BS(r)) \\ Z(r, BS^*(r)) &= \int max\{V(r) - r - C, -r\}dF(C). \end{aligned}$$

Ex-post negotiations and Relative Efficiency II

Since r^{ED} solves $\max\{V(r) - r\}$,

$$V(r^{ED}) - r^{ED} > V(r^{RD}) - r^{RD}$$

Also, $-r^{ED} > -r^{RD}$.
Therefore

$$Z(r^{ED}, BS^{*ED}(r^{ED})) \geq Z(r^{RD}, BS^{*}(r^{RD})) \geq Z(r^{RD}, BS(r^{RD})).$$