

Working notes for Inefficient Concessions

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Want to develop result showing that mediator increases potential for peace

- i.e. want to show mediator makes (Trust, Trust) and equilibrium over a larger parameter space than without mediator

What do we know?

- Theorem 4: Under some parameters, optimal concessions aren't made when there isn't trust
 - This is still a separating equilibrium, but completely inefficient concessions are given. So welfare is lower because of inefficient concessions.
 - Where there is a possibility of mediation helping to achieve peace where it otherwise would not be attainable (not just improving welfare) is if this reduction in welfare due to the inefficient concessions means that for some parameters it's not worth separating so we don't get peace at all without the mediator.
 - * i.e. when welfare for high type from separating falls below that for pooling, separating is no longer an equilibrium (convo with Jean-Guillaume).
- Theorem 5: Mediator eliminates inefficient concessions
 - Here, we're already in that parameter space where there *are* inefficient concessions

Will need to start by assuming that $\delta_h < \text{threshold}$ where separating with no concessions works.

Intermediate step for Theorem 4

- Low type IC constraint to solve for equilibrium high type gift
- Already having shown $g_l = 0$, can set $g_h = g$ for simplicity of notation

- Also, since all the discount factors are for the low type, I'll let $\delta_l = \delta$
- For the case where $e = 1$:

IC constraint:

$$X_{FF}^l \geq pX_{FT}^l + (1-p)X_{FF}^l - g$$

Expanded in basic terms (without efficiency issues)

$$\frac{W-D}{1-\delta} \geq p \left[T + W + \frac{\delta}{1-\delta} (W-D) \right] + (1-p) \frac{W-D}{1-\delta} - g$$

Multiply through by $(1-\delta)$

$$W-D \geq p(1-\delta)[T+W] + p\delta(W-D) + (1-p)[W-D] - (1-\delta)g$$

Now add complexity from Table 2

$$\begin{aligned} W(1+(1-\alpha_1)g_2) - D(1+(1-\alpha_2)g_1) \geq \\ p(1-\delta)[T(1+\alpha_2g_1) + W(1+(1-\alpha_1)g_2)] + p\delta(W(1+(1-\alpha_1)g_2) - D(1+(1-\alpha_2)g_1)) \\ + (1-p)[W(1+(1-\alpha_1)g_2) - D(1+(1-\alpha_2)g_1)] - (1-\delta)g \end{aligned}$$

Substitute in $\alpha_1 = 0$ everywhere since this is the IC for a low-type of player 1:

$$\begin{aligned} W(1+g_2) - D(1+(1-\alpha_2)g_1) \geq \\ p(1-\delta)[T(1+\alpha_2g_1) + W(1+g_2)] + p\delta(W(1+g_2) - D(1+(1-\alpha_2)g_1)) \\ + (1-p)[W(1+g_2) - D(1+(1-\alpha_2)g_1)] - (1-\delta)g \end{aligned}$$

Set $g_1 = 0$ on the LHS and $g_1 = g$ on the RHS:

$$\begin{aligned} W(1+g_2) - D \geq \\ p(1-\delta)[T(1+\alpha_2g) + W(1+g_2)] + p\delta(W(1+g_2) - D(1+(1-\alpha_2)g)) \\ + (1-p)[W(1+g_2) - D(1+(1-\alpha_2)g)] - (1-\delta)g \end{aligned}$$

Set $g_2 = 0$ and $\alpha_2 = 0$ wherever there is a $(1-p)$ and $g_2 = g$ and $\alpha_2 = 1$ wherever there is a p :

$$\begin{aligned} pW(1+g) + (1-p)W - D \geq \\ p(1-\delta)[T(1+g) + W(1+g)] + p\delta(W(1+g) - D) \\ + (1-p)[W - D(1+g)] - (1-\delta)g \end{aligned}$$

Expand

$$\begin{aligned}
pW + pWg + W - pW - D \geq \\
(p - p\delta) [T + Tg + W + Wg] + p\delta (W + Wg - D) \\
+ (1 - p) [W - D - Dg] - (1 - \delta) g
\end{aligned}$$

Cancel some like terms and move $(1 - \delta) g$ to LHS

$$\begin{aligned}
(1 - \delta) g + pWg + W - D \geq \\
p [T + Tg + W + Wg] - p\delta [T + Tg] - p\delta D \\
+ (1 - p) [W - D - Dg]
\end{aligned}$$

Do some more canceling and expanding

$$\begin{aligned}
(1 - \delta) g + W - D \geq \\
p [T + Tg + W] - p\delta T - p\delta Tg - p\delta D \\
+ W - D - Dg - pW + pD + pDg
\end{aligned}$$

$$(1 - \delta) g \geq pT + pTg + pW - p\delta T - p\delta Tg - p\delta D - Dg - pW + pD + pDg$$

$$(1 - \delta) g \geq pT + pTg - p\delta T - p\delta Tg - p\delta D - Dg + pD + pDg$$

Now just rearrange to get all the g terms on the left

$$(1 - \delta) g - pTg + p\delta Tg + Dg - pDg \geq pT - p\delta T - p\delta D + pD$$

$$[(1 - \delta) - p(1 - \delta)T + (1 - p)D] g \geq p(1 - \delta)(T + D)$$

$$g \geq \frac{p(1 - \delta)(T + D)}{(1 - \delta) - p(1 - \delta)T + (1 - p)D}$$

In comparing to the minimum separating gift when $e = 0$, which is

$$g \geq \frac{p(1 - \delta)(T + D)}{(1 - \delta)}$$

We can simplify to see that the minimum gift when $e = 1$ is larger when

$$(1 - \delta)pT > (1 - p)D$$