

Supplement 2: Equilibrium Types III, IV, and V Examples

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October 21, 2004

This shows the simulation results for $v_1 = 0.999$, $\lambda = 0.99$, $c_2 = 0.10$, and equilibrium types III, IV, and V, as discussed in my paper “Military Coercion in Interstate Crises and the Price of Peace.” The need to see what’s going on here was prompted by the simulation run shown in Figure 1. As costs increase, there’s a curious switch to type III from IV, then to V, and finally back to type I.

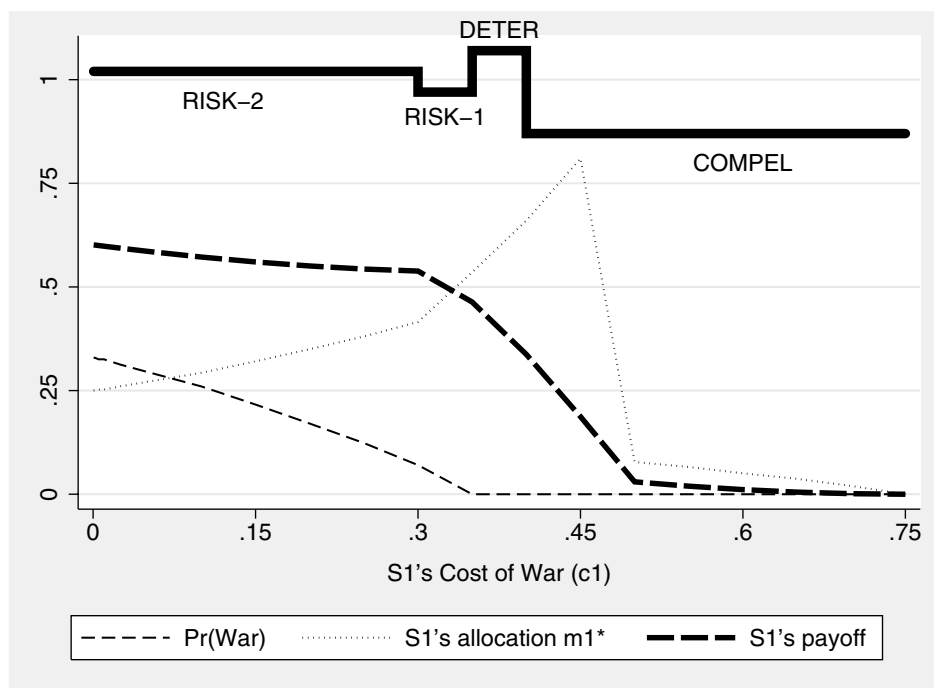


Figure 1: Probability of War and Optimal Allocations by S_1 .

Since I could not immediately see the substantive intuition behind these shifts, I look at the “offending” values $c_1 \in \{.25, .30, .35\}$ to see where m_1^* is located, and why.

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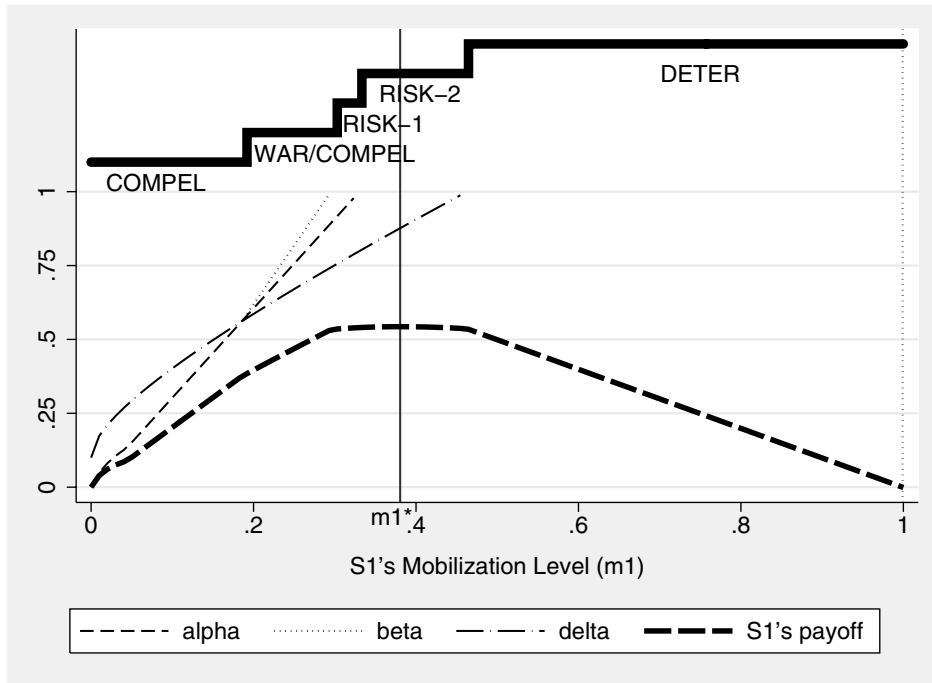


Figure 2: Type IV: $c_1 = .25$.

The reason for the shifts becomes immediately clear when we look at the plots: it has to do with where α overtakes δ . Recall that $\alpha \leq \delta$ means that all $v_2 < \alpha$ capitulate and all $v_2 \geq \alpha$ mobilize at the compellence level (Lemma 3). Only when $\alpha > \delta$ can we get any of the war equilibria. It appears that the m_1 for which $\alpha = \delta$ is increasing in c_1 . In other words, as the costs go up, it requires ever higher allocations to reach this point.

Starting with the high costs $c_1 = 0.35$, note that the point cannot be reached at all because for all $\alpha, \delta < 1$, it is the case that $\delta > \alpha$. This means that only type I or type V equilibria will be possible, as Figure 4 shows. For these costs, it is still worth deterring S_2 , but this is no longer the case for even higher costs, so S_1 reverts to the strategy that risks capitulation by him (e.g. at $c_1 > 0.45$ in Figure 1).

At slightly lower costs, there is a place where $\delta = \alpha < 1$, and so it is possible to observe all equilibrium types, as evident in Figures 2 and 3. Since costs are still somewhat high at $c_1 = 0.30$, the overtaking occurs rather “late”—that is, fairly close to 1—and at the optimal level, $\alpha < 1$, so assured compellence is, in principle, feasible. It is, however, not attempted by S_2 . Because war is a bit less costly to S_1 , there may be some desire to compel him for certain values of m_1 .

Finally, for even lower costs, the overtaking occurs fairly early because the S_1 's costs are now so low that he can require quite a bit to compel, and so the desire to do so disappears relatively fast as m_1 increases. In contrast, at very high costs, the desire to do so never vanishes, so no war will occur.

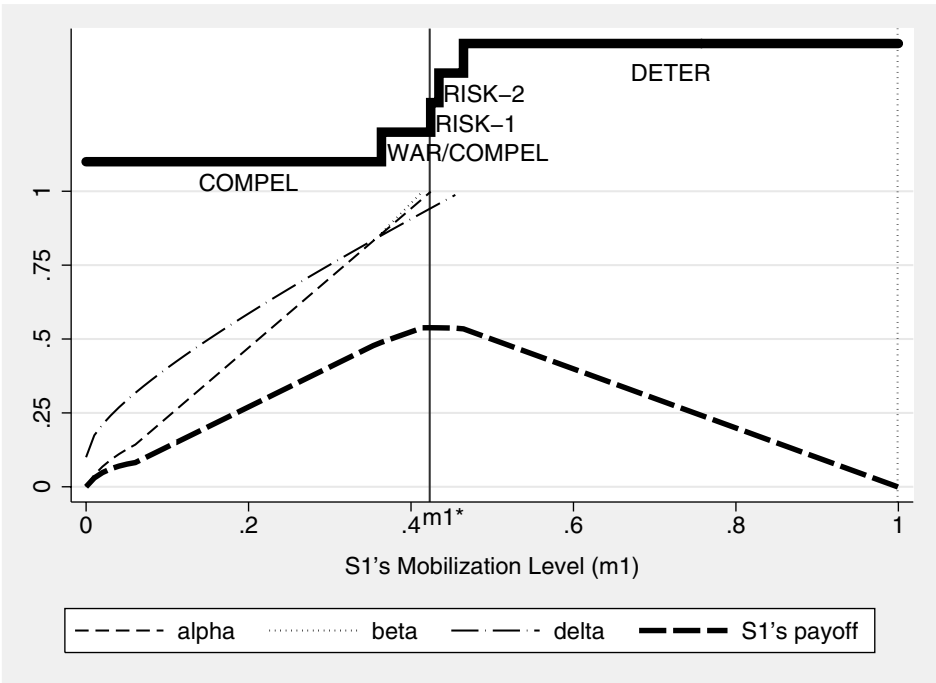


Figure 3: Type III: $c_1 = .30$.

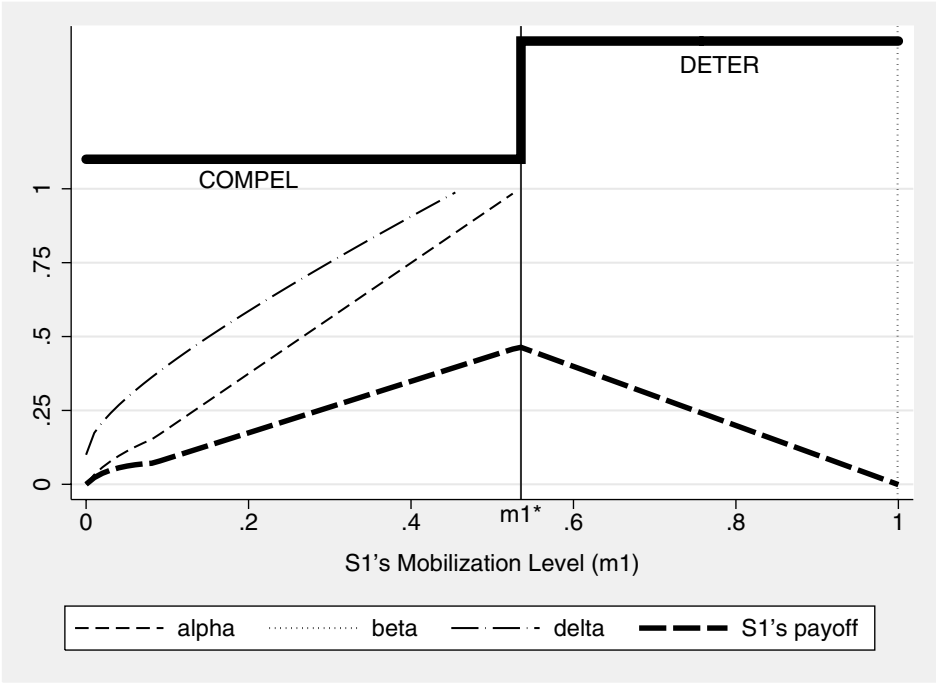


Figure 4: Type V: $c_1 = .35$.