The Bates Conjecture: A Compact Exposition with Dynamic Implications

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Abstract

A short account of Robert Bates' conjecture on prosperity and violence with dynamic implications.

Introduction. Robert Bates has suggested that societies accept violence as a price for prosperity (Bates 2001). I demonstrate the logic using a model in which access to a cheap destructive technology expands scope for cooperation. The model has implications for development dynamics and the evolution of inequality.

A collective problem. If m of n players contribute to a collective good, at cost 1, then all n receive $f(m)$, where $f(0) = 0, f' > 0$. There is a global collective action problem if $f(n) - f(n-1) < 1$ and $\arg\max_m nf(m) - m = n$: welfare is maximized when all contribute but there are private incentives not to. I assume moreover that $f(n-1) > 1$.

The shadow of the future is not enough to ensure contributions by m players if, for common discount factor δ:

$$\delta < \frac{1}{f(n-1)} - \frac{f(n) - f(n-1)}{f(n-1)}.$$

A violent solution. Instead of contributing to public goods, one player can, at per period cost k, maintain a tool that guarantees destruction of the period payoffs of one non-cooperator. Others then cooperate if $\frac{f(n-1)-1}{1-\delta} > 0$. Investment in violence each period can be incentivized by citizen threats if $f(n-1) < \frac{f(n-1)-k}{1-\delta}$.

These considerations motivate Proposition 1:

Proposition 1: A specialist in violence can render cooperation possible if $\frac{k}{f(n-1)} < \delta < \frac{1}{f(n-1)} - \frac{f(n)-f(n-1)}{f(n-1)}$

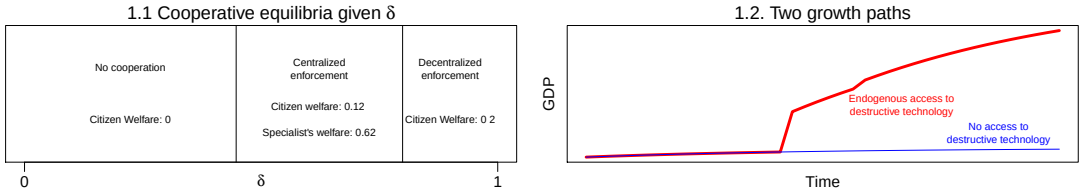

Figure 1: 1.1 Maximally cooperative equilibria $|\delta$ for $f(m) = \sqrt{m}/2, k = .5, n = 6$. 1.2. Growth.

Bates conjecture. Maximally cooperative equilibria are shown in Fig. 1.1. Consistent with the conjecture, threats by specialists in violence can improve welfare, despite deadweight losses. In particular, there is a level of δ for which cooperation requires violence. This violence must be cheap—with $k < 1 - f(n) - f(n-1)$ and results in specialists in violence doing *better* than others. Violence is not required however if players are sufficiently patient.

Dynamics. The model suggests dynamics. Consider a Solow model in which factor productivity depends on aggregate cooperation and in which welfare induces a rise in δ—via a rise in life expectancy for instance. Then destructive capacity enables steeper growth paths (Figure 1.2) with economic inequality and threats of violence rising then falling.

References

Bates, R H. 2001. *Prosperity and Violence.* WW Norton.