The Bates Conjecture: A Compact Exposition with Dynamic Implications

Macartan Humphreys

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Introduction

- Robert Bates has suggested that societies accept violence as a price for prosperity (Bates 2001, 2020; Bates, Greif, and Singh 2002).
- **Goal 1**: Demonstrate the logic in simplest form. Here using a model in which access to a cheap destructive technology expands scope for cooperation.
- **Goal 2**: Extract implications for development dynamics and the evolution of inequality.
- **Goal 3**: Keep it tight.

A collective problem

- If m of n players contribute to a collective good, at cost 1, then all n receive $f(m)$, where $f(0) = 0, f' > 0$
- Assume a prisoners' dilemma type problem when n or $n-1$ contribute
- 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 $\frac{f(n-1)-1}{1-\delta} > 0$.

$$\delta > \frac{k}{f(n-1)}$$

Equilibrium

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

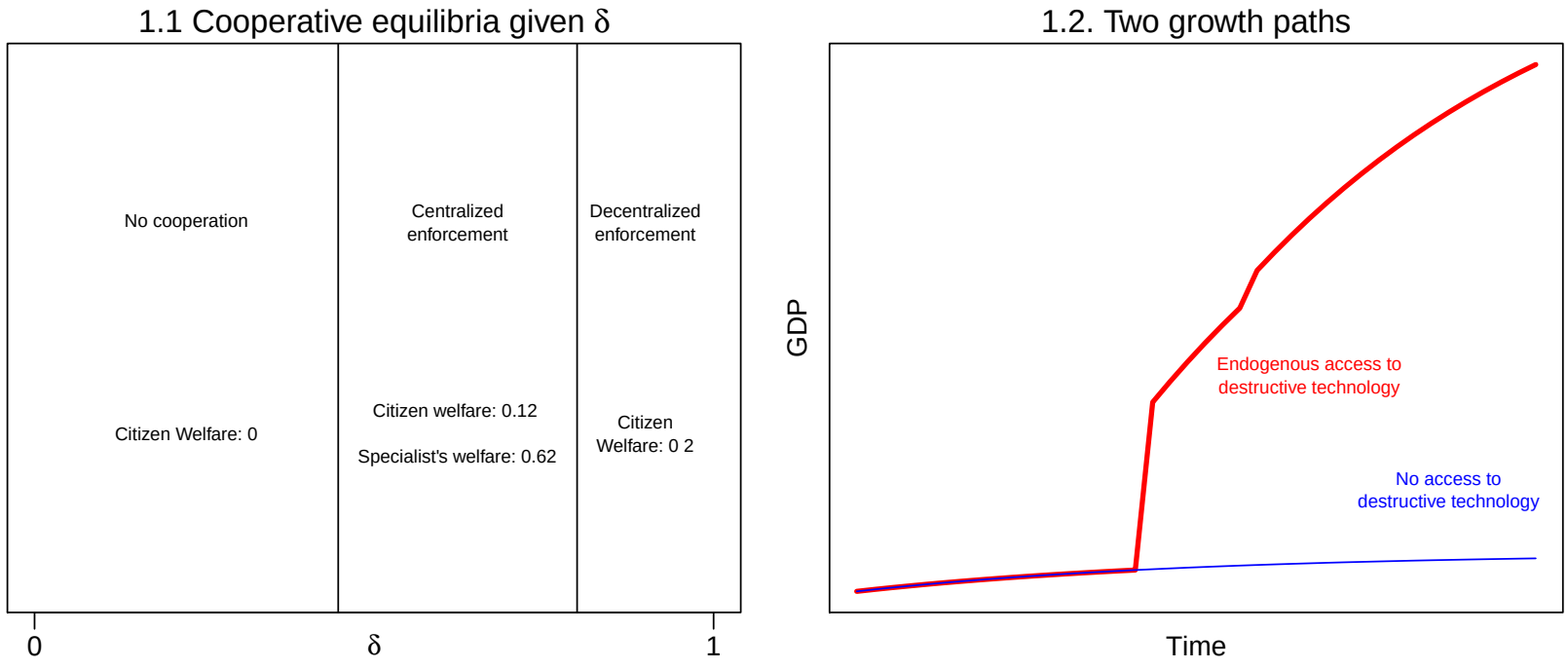

Figure 1: 1.1 Maximally cooperative equilibria given δ for $f(m) = \sqrt{m}/2, k = .5, n = 6$. 1.2. Growth.

Bates conjecture.

- Threats by specialists in violence can improve welfare, despite deadweight losses.
- There is a level of δ for which cooperation requires violence.
- Violence must be cheap—with

$$k < 1 - f(n) - f(n-1)$$

- Violence results in specialists in violence doing *better* than others.
- Violence is not required however if players are sufficiently patient.

Dynamics.

- Consider a Solow model in which factor productivity depends on aggregate cooperation
- Assume 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.

Of course

There are other ways to microfound the claim, with different dynamic implications.

This version involved destruction but not theft, which produces additional strategic complexities.

Paper

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

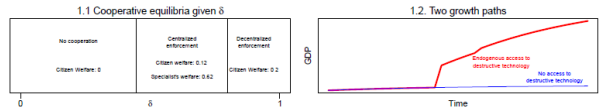

Figure 1: 1.1 Maximally cooperative equilibria $|\delta$ for $f(m) = \sqrt{m}/2, k = .5, n = 6$. 1.2. Growth.

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

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