Low Interest Rates, Market Power, and Productivity Growth

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Secular decline in the long-run real interest rate over past decades

- How do firms respond to low rates? Traditional intuition: firms raise investments
- We find: low rates are *anti-competitive*; market leaders are more responsive than followers
  - low rates raise market concentration and profits; cause market power to be more persistent
- In aggregate, very low rates ($r \to 0$) are contractionary: reduce investment and growth

Intuition: under lower r, firms compete more fiercely especially when close to each other

- Market leaders and followers respond asymmetrically to stronger neck-and-neck competition
  - leaders invest more aggressively to avoid being caught up
  - followers anticipate a tougher fight ahead, thus become relatively discouraged
- Lower interest rate magnifies the strategic asymmetry (indefinitely so as $r \to 0$)
- Strategic asymmetry
  - exists beyond R&D/productivity improvements: advertising, entry barrier, "killer acquisition"

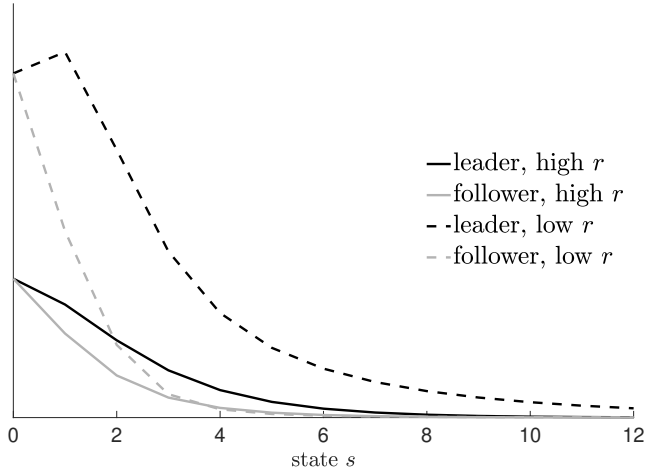
A model of dynamic competition based on the patent race literature

- Builds on Aghion, Howitt, Harris, Vickers (RES 2001), Acemoglu and Akcigit (JEEA 2012)
- A continuum of markets, each with two forward-looking firms competing for profits
  - interest rate r: rate at which future payoffs are discounted
- State variable $s \in \{0, 1, \cdots, \infty\}$: a "ladder" of productivity differences
  - profits microfounded by Bertrand competition with imperfect substitutes
  - leader profits increasing in s (follower profits decreasing in s)
- Firms invest to enhance market position: pay cost $c(\eta_s)$ for Poisson rate η_s to gain productivity
  - followers get a tailwind $\kappa \geq 0$

Key feature of the model: follower must catch up step-by-step

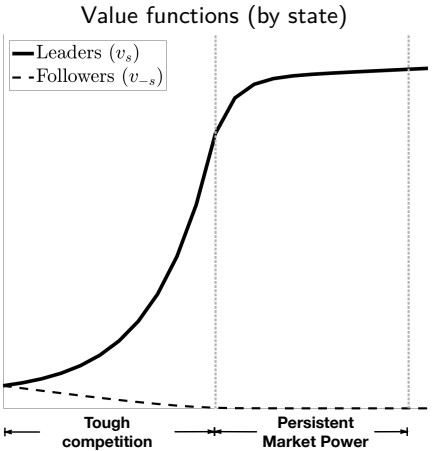
State-by-state equilibrium investment levels

Under lower r, both firms invest more, but leader is more responsive



Theorem. As $r \to 0$, in a steady state:

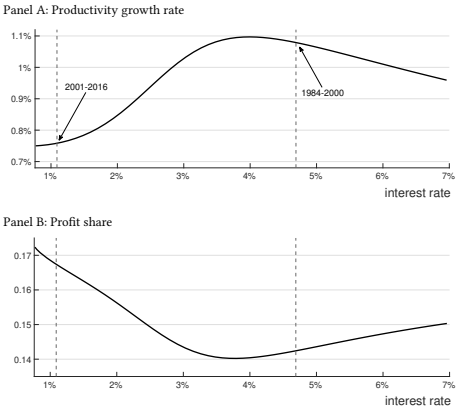
1. Leaders stay as permanent leaders, and market power becomes **permanently persistent**;
2. Profit share and markups **rise**; leader-follower distance **diverges**;
3. Aggregate investment **drops** and productivity growth **slows down**: $\lim_{r \to 0} g \propto \kappa$.



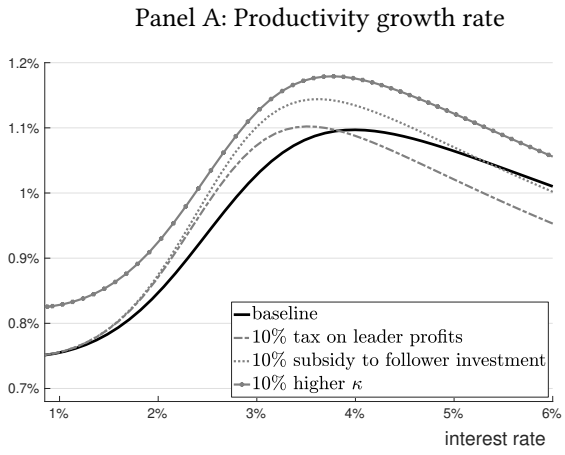
- Leader: engaging in tough competition is costly
  - tries to get far ahead to ensure persistent market power
- Follower: leadership is (endogenously) unattainable
  - gives up despite being patient
- Strategic asymmetry applies beyond productivity improvements
  - advertising, entry barrier, "killer acquisition"

A simple calibration based on Farhi and Gourio (2018)

Definition	Parameter	Value	Moment	Target	Model
Elasticity of substitution	σ	12	TFP growth, high-r	1.10%	1.09%
Productivity step size	λ	1.21	TFP growth, low-r	0.76%	0.76%
Technology diffusion rate	κ	3.93	Profit share, high-r	0.14	0.14
Investment cost shifter	c	33.4	Profit share, low-r	0.17	0.17

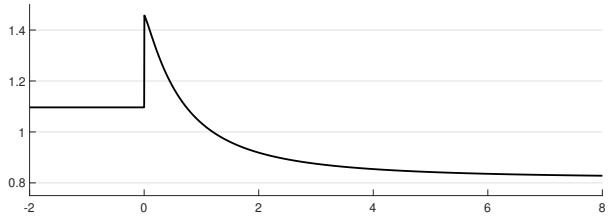


Anti-trust policies: taxing leader profits & subsidizing follower costs are ineffective as $r \to 0$

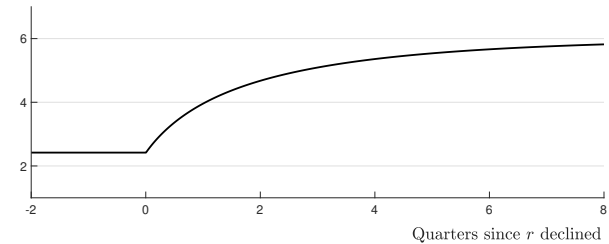


Transitional dynamics: the initial, expansionary effect of low r dissipates quickly

Panel A: Productivity growth



Panel B: Average distance between leaders and followers



Conclusion: low interest rates incentivize market leaders to "take it all"

- Low r creates strategic asymmetry between leaders & followers
  - tougher neck-and-neck competition motivates leaders & discourages followers
- With step-by-step competition, low r gives rise to greater & more persistent market power
  - as $r \to 0$, aggregate investment and growth slows down