

# Innovation, Reallocation, and Growth

Authors: Daron Acemoglu    Ufuk Akcigit    Harun Alp  
Nicholas Bloom    William Kerr  
Presented by: Jose M. Quintero

January 24, 2023

# Research Question

- ▶ Research Question: Industrial policies targeting
  - ★ Trade-offs,
  - ★ Reallocation of factors
  - ★ Firm dynamics
- ▶ Previous literature
  - ★ Silent on industrial policy
  - ★ No inefficiency from misallocation.

# This paper

- ▶ Endogenous growth model
  - ★ Firm heterogeneity
  - ★ Quality obsolescence
  - ★ Multiple exit channels
- ▶ Match the model to data
  - ★ LBD (Census data) with USPTO and RAD
  - ★ Firm exit rates
  - ★ Age and size distribution
  - ★ Growth rates

# The Model

- ▶ Firm dynamics embedded in endogenous growth a la Klette & Kortum (2004)
  - ★ Firm level investment decision to grow
  - ★ Heterogeneity in firm size
  - ★ Competition between incumbents and entrants

# The Model

- ▶ Firm dynamics embedded in endogenous growth a la Klette & Kortum (2004)
  - ★ Firm level investment decision to grow
  - ★ Heterogeneity in firm size
  - ★ Competition between incumbents and entrants
- ▶ Firms Exit
  - ★ *Creative destruction.*
  - ★ Endogenous obsolescence.
  - ★ Exogenous shock.

# The Model

- ▶ Firm dynamics embedded in endogenous growth a la Klette & Kortum (2004)
  - ★ Firm level investment decision to grow
  - ★ Heterogeneity in firm size
  - ★ Competition between incumbents and entrants
- ▶ Firms Exit
  - ★ *Creative destruction.*
  - ★ Endogenous obsolescence.
  - ★ Exogenous shock.
- ▶ Firms Heterogeneity
  - ★ Firm efficiency: Positive selection.
  - ★ Type transition: Negative selection

# How do we get some nice results?

## ► Examining the value function

$$(r + \varphi)V(\mathbf{q}) - \underbrace{\dot{V}(\mathbf{q})}_{\frac{\partial V}{\partial q} \frac{\partial q_j}{\partial w^u} \frac{\partial w^u}{\partial t}} = \max_{x_f \geq 0} \left\{ \begin{array}{l} \sum_{q_j \in \mathbf{q}} \underbrace{\tilde{\pi}(\mathbf{q}_j)}_{\text{Profits}} - \underbrace{\tilde{w}^s \Phi_j}_{\text{Fix Cost}} - \underbrace{\tilde{w}^s x_f^{\frac{1}{1-\gamma}}}_{\text{R\&D}} \\ \sum_{q_j \in \mathbf{q}} \underbrace{\tau(V(\mathbf{q} \ominus \{\mathbf{q}_j\}) - V(\mathbf{q}))}_{\text{Creative Destruction}} \\ \sum_{q_j \in \mathbf{q}} \underbrace{x [\mathbb{E}_j V(\mathbf{q} \oplus \{\mathbf{q}_j + \bar{q}\lambda\}) - V(\mathbf{q})]}_{\text{Innovation}} \end{array} \right.$$

## ► Blue terms make the value function separable in $q_j$ .

# It is all reallocation

TABLE 11—RESTRICTED SOCIAL PLANNER

	$x^{entry}$	$x^l$	$x^h$	$\Phi^l$	$\Phi^h$	$\hat{q}_{l, \min}$	$\hat{q}_{h, \min}$	$g$	Wel
1. Baseline	0.51	25.90	38.13	55.04	6.28	147.26	130.33	2.26	100.00
2. Social planner (SP)	0.60	25.42	45.34	5.64	44.70	240.42	27.80	2.94	104.47
3. SP choosing innovation	0.52	25.63	38.71	54.45	6.91	147.26	130.33	2.26	100.00
4. SP choosing $\hat{q}_{\min}$	0.94	25.90	38.13	39.74	18.92	161.16	29.91	2.43	101.58



# What's next?

- ▶ Internal innovation
  - ★ Every innovation will eventually be lost
- ▶ Public Finance
  - ★ Distortionary taxes
  - ★ Mechanism design
- ▶ How do expand this framework to explain recent trends?
  - ★ Market concentration
  - ★ Ownership of the firm: M&A, VC investment, IPO.