Labor Market Dynamics

When Ideas Are Getting Harder to Find

Adrien Bilal — Harvard

Niklas Engbom — NYU

Simon Mongey — Chicago

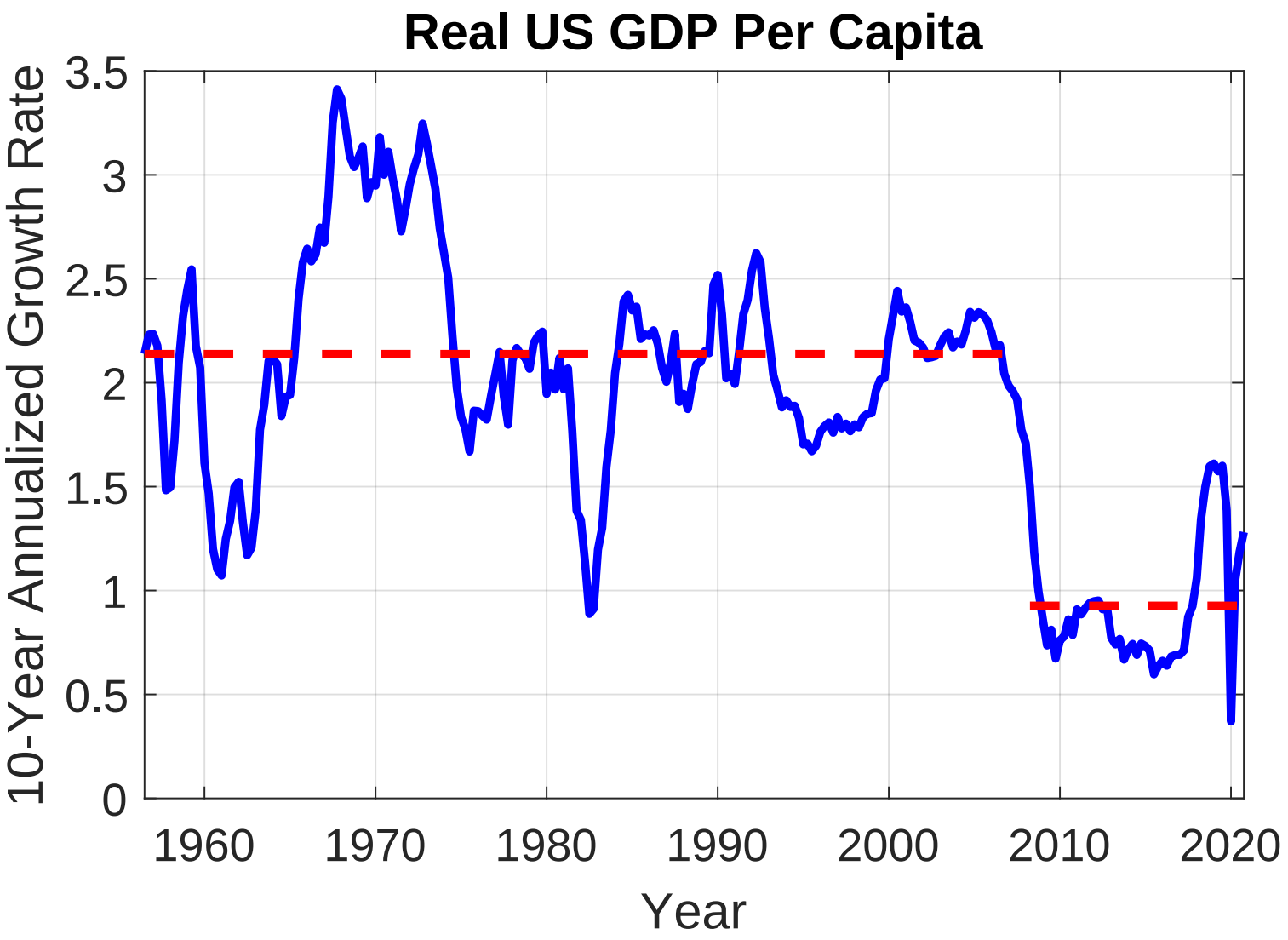
Gianluca Violante — Princeton

The Economics of Creative Destruction

A Conference in Honor of Philippe Aghion and Peter Howitt

PRINCETON UNIVERSITY

U.S. Growth Slowdown



Question and Answer

Question:

- What is the impact of a growth slowdown on the labor market, in the presence of search frictions to labor reallocation?

- Framework with endogenous growth, multi-worker firms, firm entry/exit, job reallocation, worker flows (churn), OJS, and unemployment

Question and Answer

Question:

- What is the impact of a growth slowdown on the labor market, in the presence of search frictions to labor reallocation?

- Framework with endogenous growth, multi-worker firms, firm entry/exit, job reallocation, worker flows (churn), OJS, and unemployment

Answer:

- Model predicts many of the facts about declining labor market dynamism observed in the U.S.

- It also predicts a fall in labor misallocation

Literature

1. Growth, unemployment and labor reallocation
    - Aghion and Howitt (1994), Mortensen and Pissarides (1998), Pissarides and Vallanti (2007), Michau (2013), Luttmer (2007), Engbom (2020)
2. Ideas becoming harder to find
    - Gordon (2016), Bloom, Jones, Van Reenen and Webb (2020), Akcigit and Ates (2021)
3. Declining business dynamism
    - Davis and Haltiwanger (2014), Pugsley and Sahin (2019), Aghion, Bergeaud, Boppart, Klenow and Li (2019)
4. OJS with multi-worker firms and curvature in the revenue function
    - Postel-Vinay and Robin (2002), Lenz and Mortensen (2010), Schaal (2017), BEMV (2019)

Demographics and Preferences

- Time is continuous
- Measure one of ex-ante equal ∞-lived workers
- Preferences over a continuum of varieties of fixed size $\mathtt{m}$:

$$U_0 = \int_0^\infty e^{-\rho t} C_t dt \qquad C = \left(\int_0^{\mathtt{m}} c_i^{\frac{\gamma-1}{\gamma}} di \right)^{\frac{\gamma}{\gamma-1}}$$

- Supply inelastically one unit of labor
- Can be employed or unemployed
- When unemployed, they receive b from the government

Frictional Labor Market

- Unemployed: meet vacancies at rate λ^U
- Employed:
  - Search with relative intensity $\xi \quad \rightarrow \quad \lambda^E = \xi\lambda^U$
  - Lose job endogenously, or exogenously at rate δ
- Vacancies v: firms meet workers at rate λ^F at cost $c(v; n)$
- CRS matching function $(\mathtt{v}, \mathtt{s}) \quad \rightarrow \quad \theta = \mathtt{v}/\mathtt{s}$
  - $\mathtt{s} = \mathtt{u} + \xi(1 - \mathtt{u})$ is the mass of effective job seekers

Technology

- Each firm is the monopolistic producer of one of the $\mathtt{m}$ varieties
- Let n be its number of workers and z its idiosyncratic productivity:

$$d \log z_t = \sigma dW_t$$

- Output $y = zn$ and revenue function:

$$R(z, n) = \max_p \; p(y)y = (zn)^{\frac{\gamma-1}{\gamma}} Y^{\frac{1}{\gamma}}$$

- Note: firm revenue function is concave in n
- Frictional adjustment of n: firm problem is dynamic
- Endogenous firm entry and exit

Endogenous Growth

- New entrants pay a cost to draw z from a transformation of the incumbents' productivity distribution
- ψ: strength of imitation $\Rightarrow$ endogenous productivity growth rate μ
- Creative destruction: entrant replaces incumbent in producing variety

Endogenous Growth

- New entrants pay a cost to draw z from a transformation of the incumbents' productivity distribution
- ψ: strength of imitation $\Rightarrow$ endogenous productivity growth rate μ
- Creative destruction: entrant replaces incumbent in producing variety
- Model calibrated to U.S. economy 2010-2020
- Experiment: trace effect of a change in ψ on equilibrium allocations
  1. Capitalization: streams of output are discounted at lower rate
  2. Creative destruction: costs grow faster than revenues for incumbents

Endogenous Growth

- New entrants pay a cost to draw z from a transformation of the incumbents' productivity distribution
- ψ: strength of imitation $\Rightarrow$ endogenous productivity growth rate μ
- Creative destruction: entrant replaces incumbent in producing variety
- Model calibrated to U.S. economy 2010-2020
- Experiment: trace effect of a change in ψ on equilibrium allocations
  1. Capitalization: streams of output are discounted at lower rate
  2. Creative destruction: costs grow faster than revenues for incumbents
  3. Misallocation: firms further away from their frictionless optimal size

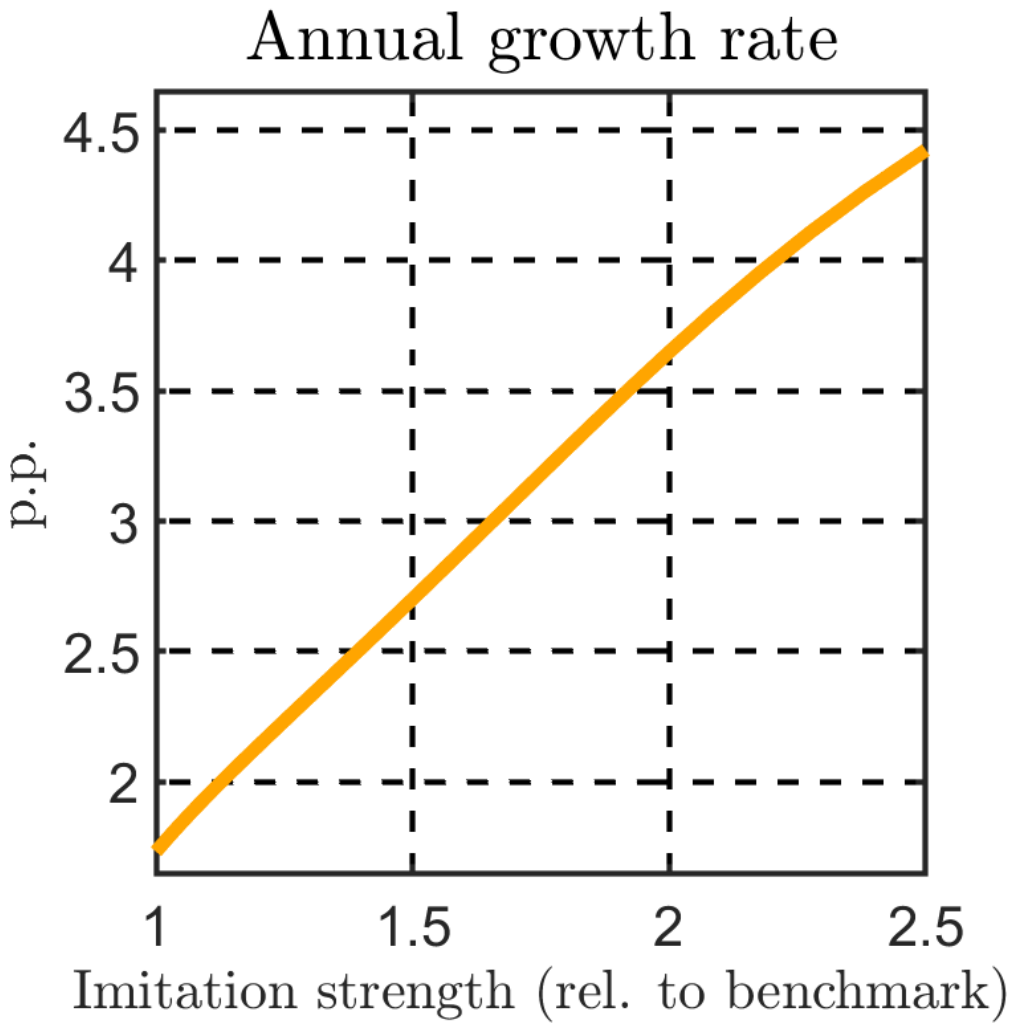
Model Solution

- Challenge: state space blows up with nonlinear revenue funct. and OJS
- Approach: all decisions within 'organizations' are privately efficient
- BEMV (2019): allocative decisions (entry, exit, vacancy posting, worker mobility) are obtained from the joint surplus S generated by the firm (owner of the technology) and its incumbent workers
- Contractual environment: natural extension of 'sequential auction' framework of Postel-Vinay & Robin with multi-worker firms

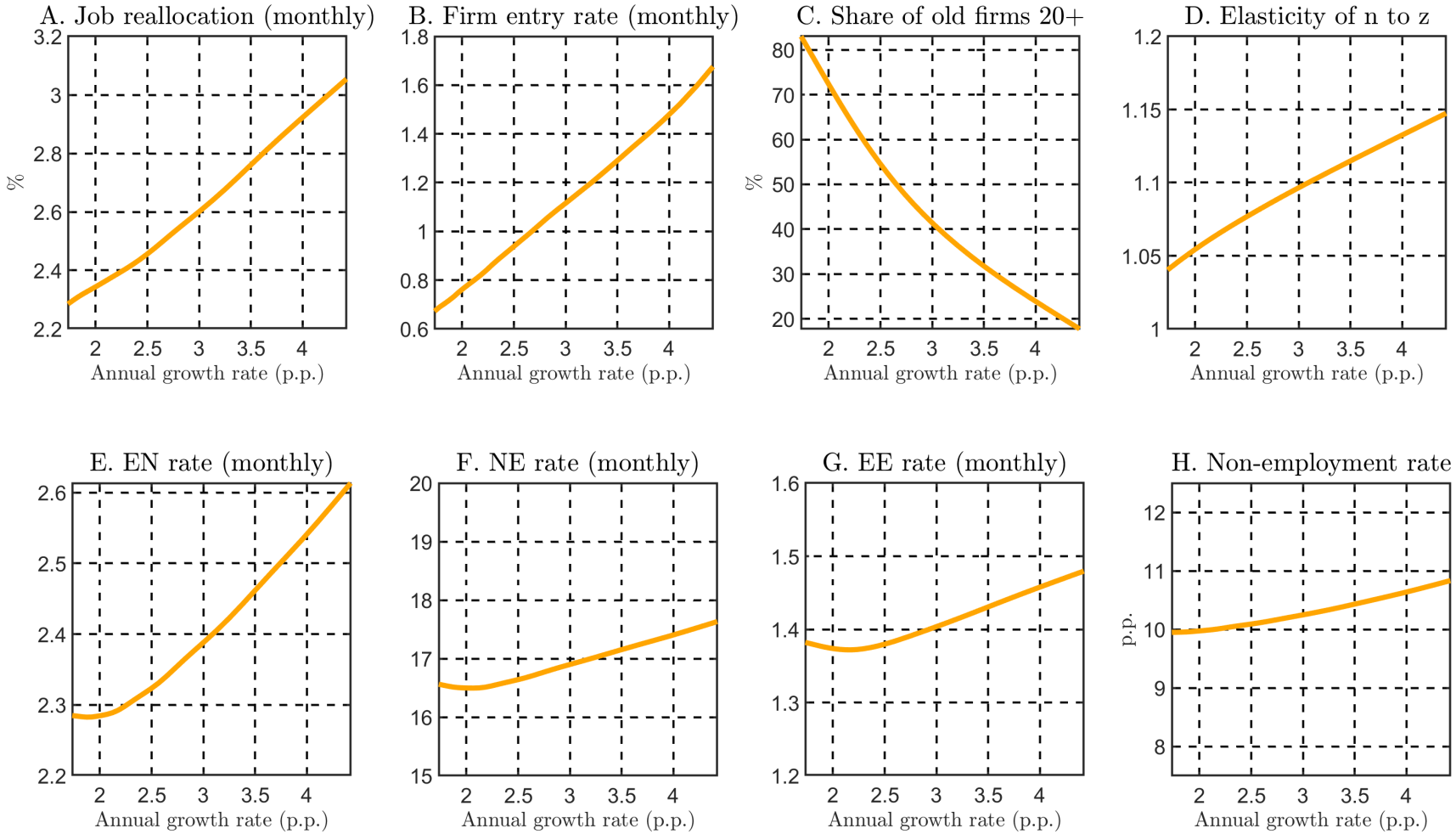
Model Solution

- Challenge: state space blows up with nonlinear revenue funct. and OJS
- Approach: all decisions within 'organizations' are privately efficient
- BEMV (2019): allocative decisions (entry, exit, vacancy posting, worker mobility) are obtained from the joint surplus S generated by the firm (owner of the technology) and its incumbent workers
- Contractual environment: natural extension of 'sequential auction' framework of Postel-Vinay & Robin with multi-worker firms
- Three appealing properties of such representation:
  1. Parsimonious state space: (z, n)
  2. Endogenous job ladder in marginal surplus S_n
  3. Special cases: Postel-Vinay & Robin and Hopenhayn / Luttmer

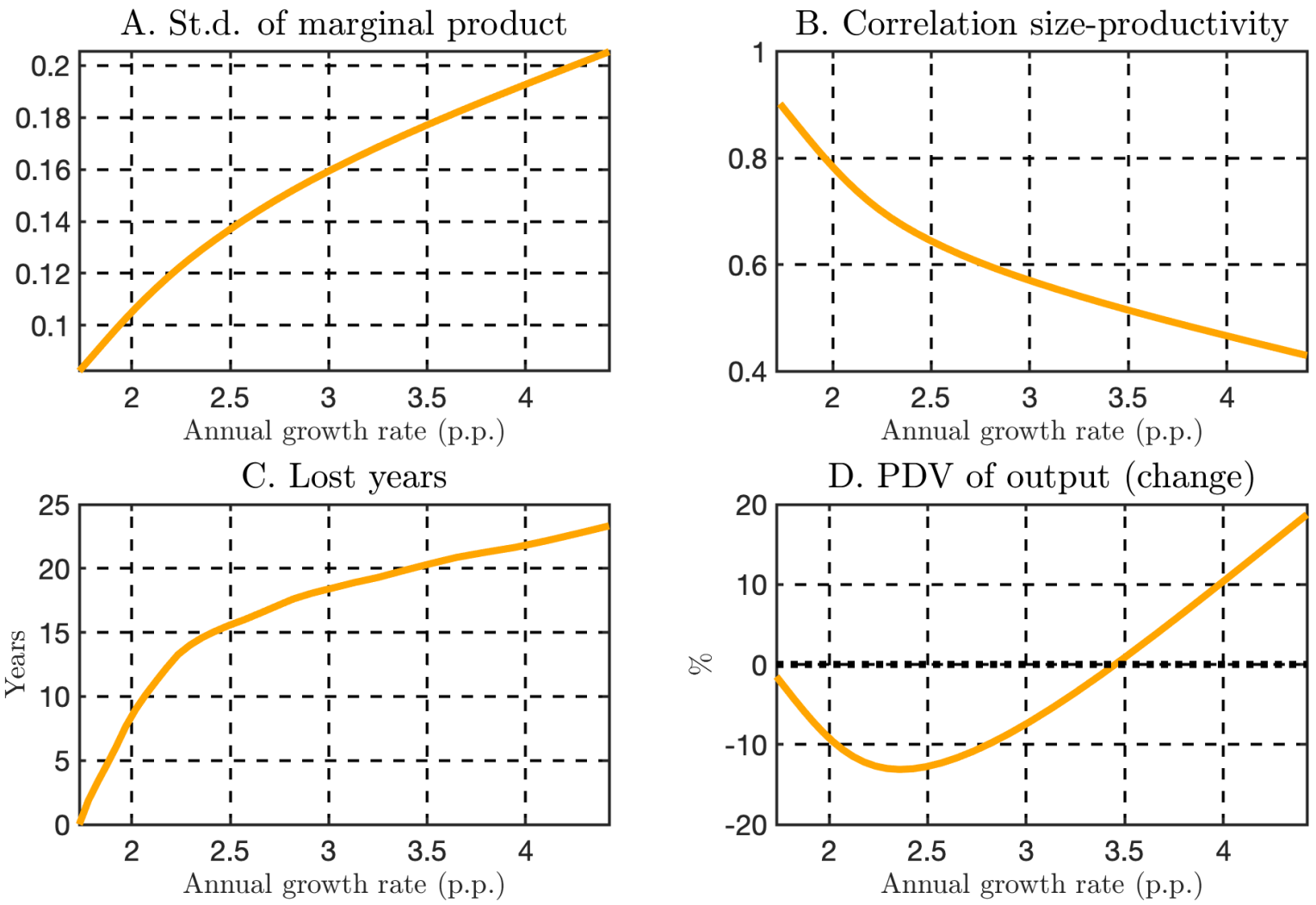
Ideas Harder to Find ⇒ Slower Growth



Slower Growth ⇒ Diminished Business Dynamism



Slower Growth ⇒ Less Misallocation



Conclusions

- Through the lenses of a model that combines endogenous growth, firm dynamics, and frictional labor reallocation...
- ... we argue that when growth slows down:
  1. Firm entry falls and the employment share of old firms rises
  2. All labor market flows decline
  3. Firm-level employment is less responsive to shocks
  4. But, labor misallocation can be less severe
- To be explored: interaction between shock and labor market institutions (cross-country), in the spirit of Blanchard and Wolfers (2000), Hornstein, Krusell and Violante (2006)