Adverse Selection, Slow Moving Capital and Misallocation.

William Fuchs Brett Green Dimitris Papanikolaou

Berkeley Haas - Kellogg

Fall 2013

Motivation

- Economies respond sluggishly to aggregate shocks
  - Christiano, Eichenbaum and Evans (2005), Eberly, Rebelo and Vincent (2012)
- Capital misallocation matters.
  - e.g., Syverson (2004); Foster, Haltiwanger, and Syverson (2008)
- Especially in developing countries.
  - e.g., Hsieh and Klenow (2009)

Motivation (cont'd)

- Adjustment costs often used to explain these patterns:
  - 'k-dot' adjustment cost generate slow changes in the capital stock
    - Pindyck (1982), Abel (1984), Abel and Eberly (1994)
  - 'i-dot' adjustment costs to generate slow changes in investment
    - Christiano, Eichenbaum and Evans (2005)
  - Counter-cyclical adjustment costs generate pro-cyclical reallocation
    - Eisfeldt and Rampini (2006)
- But what do these costs represent? Physical costs vs market frictions

This Paper

- A microfoundation for capital adjustment costs based on adverse selection

This Paper

- A microfoundation for capital adjustment costs based on adverse selection
  - Flexible model: generates rich reallocation dynamics

This Paper

- A microfoundation for capital adjustment costs based on adverse selection
  - Flexible model: generates rich reallocation dynamics
  - Misallocation increases with
    - productivity dispersion (degree of adverse selection)
    - frequency of productivity shifts
    - lower interest rate

This Paper

- A microfoundation for capital adjustment costs based on adverse selection
  - Flexible model: generates rich reallocation dynamics
  - Misallocation increases with
    - productivity dispersion (degree of adverse selection)
    - frequency of productivity shifts
    - lower interest rate
- Applications

This Paper

- A microfoundation for capital adjustment costs based on adverse selection
  - Flexible model: generates rich reallocation dynamics
  - Misallocation increases with
    - productivity dispersion (degree of adverse selection)
    - frequency of productivity shifts
    - lower interest rate
- Applications
  - **Physical (or Human) Capital Reallocation.**

This Paper

- A microfoundation for capital adjustment costs based on adverse selection
  - Flexible model: generates rich reallocation dynamics
  - Misallocation increases with
    - productivity dispersion (degree of adverse selection)
    - frequency of productivity shifts
    - lower interest rate

- Applications
  - **Physical (or Human) Capital Reallocation.**
  - Technological Innovation and New Investment.

This Paper

- A microfoundation for capital adjustment costs based on adverse selection
    - Flexible model: generates rich reallocation dynamics
    - Misallocation increases with
      - productivity dispersion (degree of adverse selection)
      - frequency of productivity shifts
      - lower interest rate

- Applications
    - **Physical (or Human) Capital Reallocation.**
    - Technological Innovation and New Investment.
    - Slow moving financial capital.

Related Literature

- **Convex Adjustment Cost and Time to Build Models**
  - Hall and Jorgenson (1967), Lucas and Prescott (1971), Hayashi (1982), Kydland and Prescott (1982), Pindyck (1982), Abel (1983), Abel and Eberly (1994), Eisfeldt and Rampini (2006), Lucca (2007)
- **Search and Capital Mobility:**
  - Vayanos and Weil (2005), Duffie and Strulovici (2012), Gromb and Vayanos (2012)
- **Financial Constraints:**
  - Bernanke and Gertler (1989), Kiyotaki and Moore (1998), Banerjee and Newman (1993), Gilchrist, Sim, and Zakrajek (2013)
- **Adverse Selection and Delay:**
  - Jaansen and Roy (2002),Daley and Green (2012,2013), Fuchs and Skrzypacz (2013), Kurlat (2013)

The Model

- Different locations $l \in \{a, b\}$
  - Sectors, industries, or physical locations
- Mass $M > 1$ of firms in each location
  - Firms can operate a unit of capital only in their own location
- Unit mass of capital of quality: $\theta \in [\underline{\theta}, \bar{\theta}] \sim F(\theta)$ with $dF(\theta) > 0$
  - **Quality is privately observed** by owner of capital
- The state $\phi_t \in \{\phi_A, \phi_B\}$is a Markov process with transition probability λ.
- Output flow $\pi_l(\theta, \phi_t)$ depends on capital quality, its location and the state:

	Location	
State	π_A	π_B
ϕ_A	$\pi_1(\theta)$	$\pi_0(\theta)$
ϕ_B	$\pi_0(\theta)$	$\pi_1(\theta)$

where $\pi_1(\theta) > \pi_0(\theta)$ and $\pi_i'(\theta) > 0$.

The Model (cont'd)

- In order for capital to be reallocated it must be traded in a continuously open market.
- Only friction adverse selection. (not adj costs, no search, deep pockets)
- Firms can observe in which sector the capital is that they are buying but not its quality.
- Existing capital depreciates and new capital flows in at rate δ
  - New capital flows into efficient sector (maintains full support).
- Firms maximize the present expected profits discounted at $\rho = r + \delta$

Transitory vs Permanent

- If we have just one permanent transition then the value to the buyers of capital of type θ is simply $V_1(\theta) = \frac{\pi_1(\theta)}{\rho}$.

Transitory vs Permanent

- If we have just one permanent transition then the value to the buyers of capital of type θ is simply $V_1(\theta) = \frac{\pi_1(\theta)}{\rho}$.
- If the state is transitory then buyers will take into account the inefficiencies they will face at the time of future sales when valuing capital.

Transitory vs Permanent

- If we have just one permanent transition then the value to the buyers of capital of type θ is simply $V_1(\theta) = \frac{\pi_1(\theta)}{\rho}$.
- If the state is transitory then buyers will take into account the inefficiencies they will face at the time of future sales when valuing capital.
  - The problem is harder since $V_1(\theta)$ will be endogenous.

Transitory vs Permanent

- If we have just one permanent transition then the value to the buyers of capital of type θ is simply $V_1(\theta) = \frac{\pi_1(\theta)}{\rho}$.
- If the state is transitory then buyers will take into account the inefficiencies they will face at the time of future sales when valuing capital.
  - The problem is harder since $V_1(\theta)$ will be endogenous.
  - Different types of capital will have different **illiquidity discounts**.

Permanent: Seller's Problem

- Given P_t sellers face a stopping problem:

$$\sup_{\tau} \int_0^{\tau} e^{-\rho t} \pi_0 \left(\theta\right) dt + e^{-\rho \tau} P_t$$

Permanent: Seller's Problem

- Given P_t sellers face a stopping problem:

$$\sup_{\tau} \int_0^{\tau} e^{-\rho t} \pi_0 (\theta) \, dt + e^{-\rho \tau} P_t$$

- Skimming Property: If it is optimal for type θ to trade at time t, then strictly optimal for all $\theta' < \theta$ to trade at (or before) t.

Permanent: Seller's Problem

- Given P_t sellers face a stopping problem:

$$\sup_{\tau} \int_0^{\tau} e^{-\rho t} \pi_0(\theta)\, dt + e^{-\rho \tau} P_t$$

- Skimming Property: If it is optimal for type θ to trade at time t, then strictly optimal for all $\theta' < \theta$ to trade at (or before) t.

- Let χ_t denote the lowest quality asset that has not been traded by time t :

$$\chi_t = \inf \{\theta_i : \tau_i \geq t\}$$

Permanent: Equilibrium

Definition

A path for prices P and stopping rules $\tau(\theta)$ is a **Competitive Decentralized Equilibrium** if:

(i) **Sellers Optimize:** Given P, $\tau(\theta)$ solves the Seller's Problem

(ii) **Zero Profit:** Let $\Theta_t \neq \emptyset$ denote the set of types that trades at t, then:

$P_t = E\left[V_1(\theta) \,|\theta \in \Theta_t\right]$

(iii) **Market Clearing:** $P_t \geq V_1(\chi_t)$

Permanent: Separating Equilibrium

- We will focus our analysis on the separating equilibrium where χ_t is strictly increasing and continuous.

- Other equilibria can be ruled out with additional assumptions.

Permanent: Characterization:

- Zero Profit requires that:

$$P_t = V_1(\chi_t) = \frac{\pi_1(\chi_t)}{\rho}$$

Permanent: Characterization:

- Zero Profit requires that:

$$P_t = V_1(\chi_t) = \frac{\pi_1(\chi_t)}{\rho}$$

- Seller's Optimality:

$$\underbrace{\rho P_t}_{\text{cost}} = \underbrace{\frac{dP_t}{dt} + \pi_0(\chi_t)}_{\text{benefit}}$$

Permanent: Characterization:

- Zero Profit requires that:

$$P_t = V_1(\chi_t) = \frac{\pi_1(\chi_t)}{\rho}$$

- Seller's Optimality:

$$\underbrace{\rho P_t}_{\text{cost}} = \underbrace{\frac{dP_t}{dt} + \pi_0(\chi_t)}_{\text{benefit}}$$

- Together:

$$\rho V_1(\chi_t) = \frac{d\chi_t}{dt}\frac{dV_1(\chi_t)}{d\chi} + \pi_0(\chi_t)$$

Permanent: Characterization:

- Letting $\dot{\chi}_t = \frac{d\chi_t}{dt}$ and rearranging:

$$\dot{\chi}_t = \frac{\pi_1(\chi_t) - \pi_0(\chi_t)}{\frac{\pi_1'(\chi_t)}{\rho}}$$

Permanent: Characterization:

- Letting $\dot{\chi}_t = \frac{d\chi_t}{dt}$ and rearranging:

$$\dot{\chi}_t = \frac{\pi_1(\chi_t) - \pi_0(\chi_t)}{\frac{\pi_1'(\chi_t)}{\rho}}$$

- The lowest type trades immediately:

$$\chi_0 = \underline{\theta}$$

Permanent: Characterization:

- Letting $\dot{\chi}_t = \frac{d\chi_t}{dt}$ and rearranging:

$$\dot{\chi}_t = \frac{\pi_1(\chi_t) - \pi_0(\chi_t)}{\frac{\pi_1'(\chi_t)}{\rho}}$$

- The lowest type trades immediately:

$$\chi_0 = \underline{\theta}$$

- This differential equation + boundary condition pin down the equilibrium. Note that $F(\theta)$ only plays a role via its support, shape does not matter.

Permanent: Characterization:

- Letting $\dot{\chi}_t = \frac{d\chi_t}{dt}$ and rearranging:

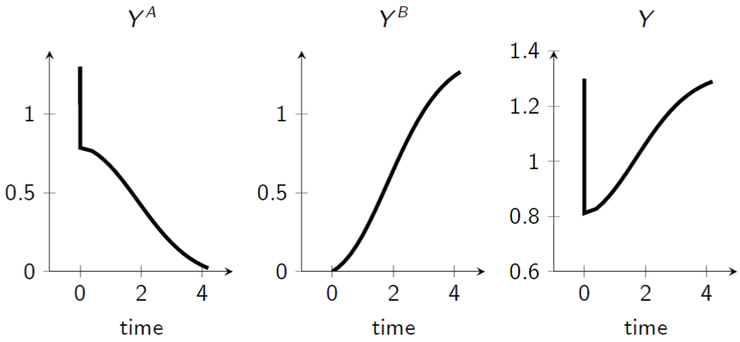
$$\dot{\chi}_t = \frac{\pi_1(\chi_t) - \pi_0(\chi_t)}{\frac{\pi_1'(\chi_t)}{\rho}}$$

- The lowest type trades immediately:

$$\chi_0 = \underline{\theta}$$

- This differential equation + boundary condition pin down the equilibrium. Note that $F(\theta)$ only plays a role via its support, shape does not matter.
- $F(\theta)$ would still matter when calculating aggregates.

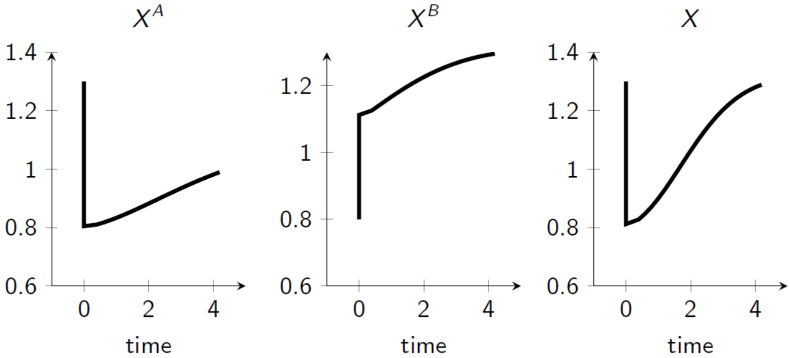
Permanent: Aggregate Output



(a) output in sector A (b) output in sector B (c) total output

Figure: Response to a sectoral productivity shift, where at $t = 0$, sector B becomes the more productive sector. The economy recovers slowly from a productivity shift even though aggregate potential output is unchanged.

Permanent: Aggregate Productivity



(a) productivity in sector A (b) productivity in sector B (c) total productivity

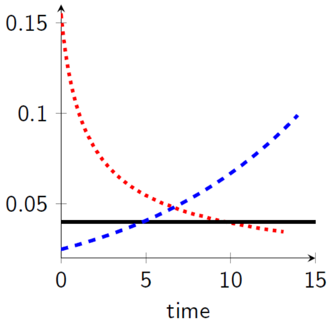
Figure: Productivity is increasing across *both* sectors.

Permanent: Example:

Let $\pi_1(\theta) = c\theta + d$ and $\pi_0(\theta) = \theta$

$$\dot{\chi}_t = \frac{(c-1)\chi_t + d}{\frac{c}{\rho}}$$

$c = 1 \rightarrow \dot{\chi}_t$ is constant over time
$c > 1 \rightarrow \dot{\chi}_t$ is increasing over time
$c < 1 \rightarrow \dot{\chi}_t$ is decreasing over time



Permanent: Example Benchmarks:

- Under full information we would have type specific prices $P(\theta)$ and all capital instantaneously reallocating.

Permanent: Example Benchmarks:

- Under full information we would have type specific prices $P(\theta)$ and all capital instantaneously reallocating.
- Convex adjustment cost model:

Permanent: Example Benchmarks:

- Under full information we would have type specific prices $P(\theta)$ and all capital instantaneously reallocating.
- Convex adjustment cost model:
  - For simplicity assume capital is homogenous.

Permanent: Example Benchmarks:

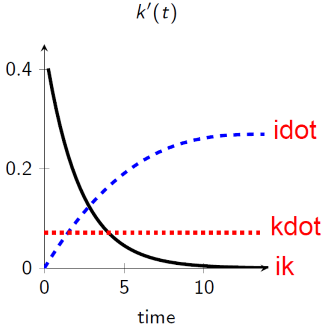
- Under full information we would have type specific prices $P(\theta)$ and all capital instantaneously reallocating.
- Convex adjustment cost model:
  - For simplicity assume capital is homogenous.
  - Specify costs in terms of how capital is reallocated between sectors:

$$c\left(k,\dot{k},\ddot{k}\right) = \begin{cases} c\left(\dot{k}\right)^2 & ('kdot') \\ c\left(\frac{k}{1-k}\right)^2(1-k) & ('ik') \\ c\left(\ddot{k}\right)^2 & ('idot') \end{cases}$$

Focus on the planner's problem:

$$\max \int_0^\infty e^{-\rho t}\left(1-k_t\right)\pi_0 + k_t\pi_1 - c\left(k_t\right)$$

Permanent: Costly Adjustment Cost Dynamics:



Adverse selection can deliver similar dynamics to those of the costly adjustment cost models!!

Transitory: Seller's Problem

- Focus on stationary separating equilibria (only time since last shock matters).

Transitory: Seller's Problem

- Focus on stationary separating equilibria (only time since last shock matters).
- Let $V_0(\theta, \chi)$ denote the value of a unit of capital inefficiently allocated.

Transitory: Seller's Problem

- Focus on stationary separating equilibria (only time since last shock matters).
- Let $V_0(\theta, \chi)$ denote the value of a unit of capital inefficiently allocated.
- The seller's Bellman equation is:

$$\rho V_0(\theta, \chi) = \pi_0(\theta) + \lambda \left(V_1(\theta) - V_0(\theta, \chi) \right) + \frac{\partial V_0(\theta, \chi)}{\partial \chi} \dot{\chi}_t$$

Transitory: Seller's Problem

- Focus on stationary separating equilibria (only time since last shock matters).
- Let $V_0(\theta,\chi)$ denote the value of a unit of capital inefficiently allocated.
- The seller's Bellman equation is:

$$\rho V_0(\theta,\chi) = \pi_0(\theta) + \lambda\left(V_1(\theta) - V_0(\theta,\chi)\right) + \frac{\partial V_0(\theta,\chi)}{\partial \chi}\dot{\chi}_t$$

- The cutoff type $(\theta = \chi)$ must be locally indifferent:

$$P'(\chi) = \frac{\partial V_0(\theta,\chi)}{\partial \chi}\Big|_{\theta=\chi}$$

Transitory: Seller's Problem

- Focus on stationary separating equilibria (only time since last shock matters).
- Let $V_0(\theta, \chi)$ denote the value of a unit of capital inefficiently allocated.
- The seller's Bellman equation is:

$$\rho V_0(\theta, \chi) = \pi_0(\theta) + \lambda \left(V_1(\theta) - V_0(\theta, \chi) \right) + \frac{\partial V_0(\theta, \chi)}{\partial \chi} \dot{\chi}_t$$

- The cutoff type $(\theta = \chi)$ must be locally indifferent:

$$P'(\chi) = \frac{\partial V_0(\theta, \chi)}{\partial \chi} |_{\theta = \chi}$$

- Combining we get:

$$\dot{\chi}_t = \frac{\rho V_1(\chi_t) - \pi_0(\chi_t)}{V_1'(\chi_t)}, \qquad \chi_0 = \underline{\theta}$$

Transitory: Seller's Problem

- Focus on stationary separating equilibria (only time since last shock matters).
- Let $V_0(\theta, \chi)$ denote the value of a unit of capital inefficiently allocated.
- The seller's Bellman equation is:

$$\rho V_0(\theta, \chi) = \pi_0(\theta) + \lambda\left(V_1(\theta) - V_0(\theta, \chi)\right) + \frac{\partial V_0(\theta, \chi)}{\partial \chi}\dot{\chi}_t$$

- The cutoff type $(\theta = \chi)$ must be locally indifferent:

$$P'(\chi) = \frac{\partial V_0(\theta, \chi)}{\partial \chi}\Big|_{\theta = \chi}$$

- Combining we get:

$$\dot{\chi}_t = \frac{\rho V_1(\chi_t) - \pi_0(\chi_t)}{V_1'(\chi_t)}, \qquad \chi_0 = \underline{\theta}$$

- Before we were done but now we must determine $V_1(\theta)$ which is now endogenous.

Transitory: Seller's Problem

Determining $V_1(\theta)$ from χ_t

$$V_1(\theta) = \frac{\rho}{\rho+\lambda}\pi_1(\theta) + \frac{\lambda}{\rho+\lambda}V_0(\theta,\underline{\theta})$$

Also,

$$V_0(\theta,\underline{\theta}) = f(\tau(\theta))\frac{\pi_0(\theta)}{\rho} + (1 - f(\tau(\theta)))V_1(\theta)$$

$\tau(\theta)$ is the time from that it takes to type θ to trade once the state switches.
$f(\tau(\theta))$ in addition takes into account discounting and the state switching.

Transitory: Characterization:

- Combining both we get:

$$V_1(\theta) = g(\tau(\theta))\frac{\pi_0(\theta)}{\rho} + (1 - g(\tau(\theta)))\frac{\pi_1(\theta)}{\rho}$$

Transitory: Characterization:

- Combining both we get:

$$V_1(\theta) = g(\tau(\theta)) \frac{\pi_0(\theta)}{\rho} + (1 - g(\tau(\theta))) \frac{\pi_1(\theta)}{\rho}$$

- Using the seller's indifference condition we can then obtain:

$$\dot{\chi}_t = \frac{\rho\left(1 - g(t) + \frac{g'(t)}{\rho}\right)(\pi_1(\chi_t) - \pi_0(\chi_t))}{g(t)\pi_0'(\chi_t) + (1 - g(t))\pi_1'(\chi_t)}$$

which (under mild regularity conditions) has a unique solution.

Existence and Uniqueness of Separating Equilibria

Theorem

There exists a unique (τ^*, V_1^*) *such that the strategies consistent with* (τ^*, V_1^*) *constitute a fully separating equilibrium.*

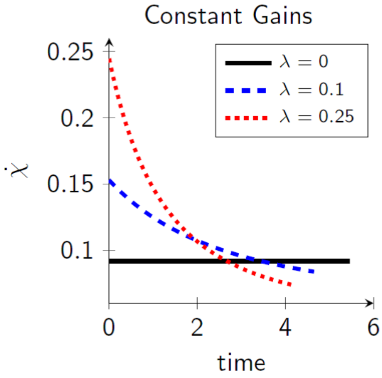
- **Remark:** If other equilibria exist they are basically characterized by a continuous flow of trade, a pause and one atom in which all remaining types trade. If the adverse selection problem is mild enough then the atom would take place at time zero. A sufficient condition to rule such equilibria out is that $\pi_0\left(\bar{\theta}\right) = \pi_1\left(\bar{\theta}\right)$.

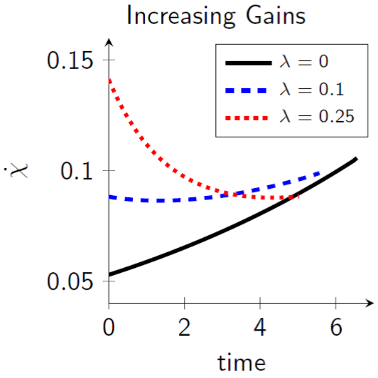
What happens when shocks are more frequent?

- Initial guess: The state will switch back soon-> less incentive to trade -> slower reallocation.

What happens when shocks are more frequent?

- Initial guess: The state will switch back soon-> less incentive to trade -> slower reallocation.
- Not correct!!





What happens when shocks are more frequent?

Result

Consider any two symmetric economies Γ_x and Γ_y, which are identical except that $\lambda_x < \lambda_y$. There exists a $\bar{t} > 0$ such that the rate of reallocation is strictly higher in Γ_y than in Γ_x prior to $\bar{t}$, i.e., $\chi_y'(t) > \chi_x'(t)$ for all $t \in [0, \bar{t}]$.

What happens when shocks are more frequent?

Explanation:

- Fix the equilibrium $\dot{\chi}_t$ in economy Γ_x and increase λ

What happens when shocks are more frequent?

Explanation:

- Fix the equilibrium $\dot{\chi}_t$ in economy Γ_x and increase λ
  - delay incurred more frequently,

What happens when shocks are more frequent?

Explanation:

- Fix the equilibrium $\dot{\chi}_t$ in economy Γ_x and increase λ
  - delay incurred more frequently,
  - marginal cost of delay increases,

What happens when shocks are more frequent?

Explanation:

- Fix the equilibrium $\dot{\chi}_t$ in economy Γ_x and increase λ
  - delay incurred more frequently,
  - marginal cost of delay increases,
  - more incentive to mimic $\underline{\theta}$

What happens when shocks are more frequent?

Explanation:

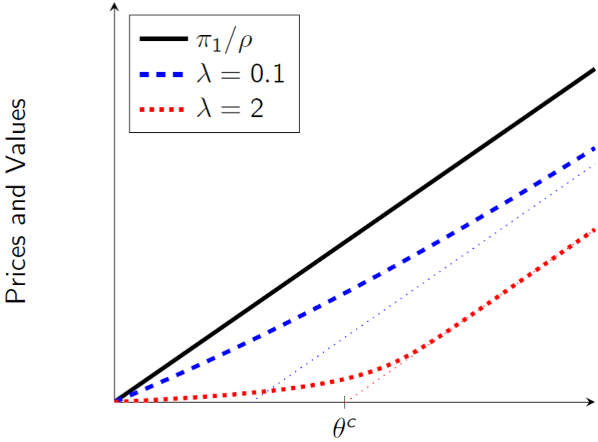
- Fix the equilibrium $\dot{\chi}_t$ in economy Γ_x and increase λ
  - delay incurred more frequently,
  - marginal cost of delay increases,
  - more incentive to mimic $\underline{\theta}$
- Types close to $\underline{\theta}$ would prefer to accept sooner when λ increases.

What happens when shocks are more frequent?

Explanation:

- Fix the equilibrium $\dot{\chi}_t$ in economy Γ_x and increase λ
  - delay incurred more frequently,
  - marginal cost of delay increases,
  - more incentive to mimic $\underline{\theta}$
- Types close to $\underline{\theta}$ would prefer to accept sooner when λ increases.
- Reallocation must "speed up" at the bottom in equilibrium.

What happens when shocks are more frequent?



Productivity Dispersion and Misallocation

- Empirical Evidence: Productivity dispersion correlated with misallocation.

Productivity Dispersion and Misallocation

- Empirical Evidence: Productivity dispersion correlated with misallocation.
- The model provides a causal link.

Productivity Dispersion and Misallocation

- Empirical Evidence: Productivity dispersion correlated with misallocation.
- The model provides a causal link.
- Dispersion can be measure by $\bar{\theta} - \underline{\theta}$

Productivity Dispersion and Misallocation

- Empirical Evidence: Productivity dispersion correlated with misallocation.
- The model provides a causal link.
- Dispersion can be measure by $\bar{\theta} - \underline{\theta}$

  - Misallocation of quality θ capital:

$$m(\theta) = 1 - \frac{\rho V(\theta) - \pi_0(\theta)}{\pi_1(\theta) - \pi_0(\theta)}$$

Productivity Dispersion and Misallocation

- Empirical Evidence: Productivity dispersion correlated with misallocation.
- The model provides a causal link.
- Dispersion can be measure by $\bar{\theta} - \underline{\theta}$

  - Misallocation of quality θ capital:

$$m(\theta) = 1 - \frac{\rho V(\theta) - \pi_0(\theta)}{\pi_1(\theta) - \pi_0(\theta)}$$

  - Aggregate misallocation:

$$\bar{m} = \int_{\underline{\theta}}^{\bar{\theta}} m(\theta)\, dF(\theta)$$

Productivity Dispersion and Misallocation

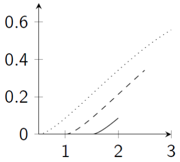
- Empirical Evidence: Productivity dispersion correlated with misallocation.
- The model provides a causal link.
- Dispersion can be measure by $\bar{\theta} - \underline{\theta}$

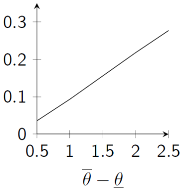
  - Misallocation of quality θ capital:

$$m(\theta) = 1 - \frac{\rho V(\theta) - \pi_0(\theta)}{\pi_1(\theta) - \pi_0(\theta)}$$

  - Aggregate misallocation:

$$\bar{m} = \int_{\underline{\theta}}^{\bar{\theta}} m(\theta)\, dF(\theta)$$





Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
    - Delayed response to shocks.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
  - Delayed response to shocks.
  - Productivity dispersion amplifies misallocation.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
  - Delayed response to shocks.
  - Productivity dispersion amplifies misallocation.
  - TFP slowdowns in response to innovation

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
  - Delayed response to shocks.
  - Productivity dispersion amplifies misallocation.
  - TFP slowdowns in response to innovation
- Several possible applications:

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
    - Delayed response to shocks.
    - Productivity dispersion amplifies misallocation.
    - TFP slowdowns in response to innovation
- Several possible applications:
    - Physical capital reallocation.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
  - Delayed response to shocks.
  - Productivity dispersion amplifies misallocation.
  - TFP slowdowns in response to innovation
- Several possible applications:
  - Physical capital reallocation.
  - Human capital reallocation.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
    - Delayed response to shocks.
    - Productivity dispersion amplifies misallocation.
    - TFP slowdowns in response to innovation
- Several possible applications:
    - Physical capital reallocation.
    - Human capital reallocation.
    - Innovation and new investment.

Conclusion

- Presented an adverse selection based mechanism for generating slow moments of capital.
- A microfoundation for convex adjustment cost models.
- Capable of generating rich dynamics/predictions.
  - Delayed response to shocks.
  - Productivity dispersion amplifies misallocation.
  - TFP slowdowns in response to innovation
- Several possible applications:
  - Physical capital reallocation.
  - Human capital reallocation.
  - Innovation and new investment.
  - Slow moving financial capital.