

Discussion of "Investing in Misallocation" by Kılıç and Tüzel

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 - ⇒ provide an explanation based on idea that firms invest in growth
- My discussion: remind what to expect in NC model + some suggestions

The neoclassical model of investment

- **Q:** why are I/K and MPK the right statistics to look at?
- Consider the NC model of investment with adjustment costs $\Phi(I, K_-)$
 - dispersion in investment driven by permanent productivity shocks ϵ and initial capital K_-
- Firm buys capital at price 1 to invest, and maximize PV of profits

$$V(K_-, Z) = \max_I Z^\alpha K^{1-\alpha} - I - \Phi(I, K_-) + \frac{\mathbb{E}_\epsilon[V(K, Z + \epsilon)]}{1+r}$$
$$\text{s.t. } K = (1 - \delta)K_- + I$$

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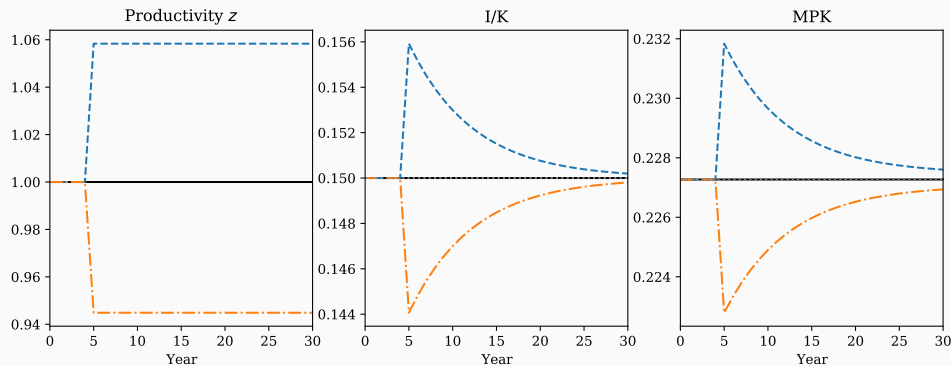
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- Without shocks, this model implies a constant MPK and I/K_- across firms

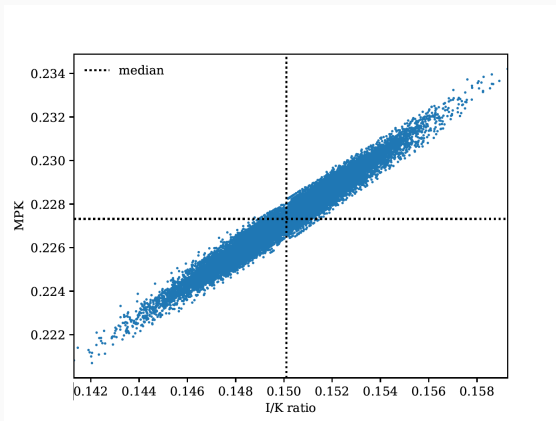
Response of I/K and MPK to productivity shocks

- After positive shock, firms want to grow $\Rightarrow \uparrow I/K$, but slowly because of adj. costs
- MPK initial rises because of productivity shock, then falls back due to decreasing returns



Cross-sectional distribution of I/K and MPK in the NC model

- Figure shows distribution of I/K and MPK from simulation of firms s.t. to shocks
 - firms are either growing (high I/K) to reap benefits from high productivity (high MPK) ...
 - ... or shrinking (low I/K) in response to low productivity (low MPK)



Cross-sectional distribution: NC model vs data

- **Q:** how does the neoclassical model of investment fare against the data?
- Table shows share of firms in each quadrant from my simulations vs data from KT paper
- In data, many unprofitable firms invest (high MPK but low I/K), and vice versa!

MPK	High	Low
	MPK	MPK
I/K	Low	High
	I/K	I/K
High	NC model: 3% Data: 21%	NC model: 47% Data: 29%
Low	NC model: 47% Data: 30%	NC model: 3% Data: 21%

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- Idea: some firms invest to increase the probability of future jumps in productivity
 - data: firms with low MPK but high I/K are more innovative + more likely to experience jumps
 - jumps and investment positively correlation in cross section of firms + time series

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- Idea: some firms invest to increase the probability of future jumps in productivity
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- Add *endogenous TFP jumps* to NC model following recent endogenous growth literature
- Estimate the model with Compustat data
 - suggestion: ORBIS has more small/young firms where jumps seems to be more important!

Main results

- Model matches key characteristics of firms in low MPK-high I/K group
 - measure of success: model is over-identified + few testable implications
 - suggestion: if jumps were twice smaller/less likely, would it be harder to match the data?

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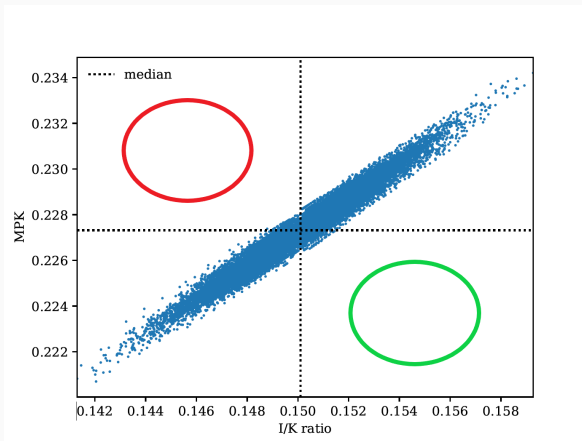
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- Estimation reveals a new perspective on firm life-cycle!
 - most firms invest in growth ($p = 95\%$) for about 10 years ($\mu = 10\%$)
- Equilibrium is efficient so don't interfere!
 - e.g. preventing firms from investing in growth \Rightarrow \downarrow TFP by 40%, and dispersion in MPK by 16%
 - very different implications than usual stories based on misallocation

Firms that do not invest despite being productive

- The paper provides a rational for firms with **low MPK and high I/K**
⇒ Q: what about firms with **high MPK and low I/K**? Report shares of firms in each group



TFP vs. MPK

- The NC model also fails to match the distribution of TFP z across firms
 - table shows median of log TFP for firms in each I/K and MPK category
 - model: TFP high when MPK is high \neq data: TFP high when I/K is high
 - \Rightarrow Q: does your model solve this disconnect?

		High MPK	
		Low I/K	High I/K
Low MPK		NC model: - 0.01 Data: - 0.06	NC model: - 0.13 Data: 0.02
		NC model: 0.09 Data: - 0.03	NC model: 0.01 Data: 0.07

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- This paper: new perspective, where vast majority of firms invest in growth
- Asset pricing implication: such firms should have high (and volatile?) price/earnings ratios
 - seems to be true anecdotally (e.g. Tesla), but is it true more broadly for these firms?
- Besides, raising funds from investors must be a lot harder for such firms!
 - investors in low-type firms can see that sales are going up + get a return after just a few years
 - high-type firms can never prove that they have potential, unless rare jump occurs!
- Bring back the frictions! Imperfect information between entrepreneurs and investors
 - **Q:** How much funds can firms raise in this environment?

Concluding thoughts

- Nice paper!
- Changed my prior on the life-cycle of firms
 - young firms not just s.t. to adjustment costs (e.g. Hopenhayn 1992, Hopenhayn Rogerson 1993)
 - also invest heavily in future growth with uncertain returns
- In my view, paper could become even more influential by pursuing implications further
 - surely, these jumps raise new issues (e.g. asset pricing, business dynamism)