Discussion of:

Productivity and Capital Allocation in Europe

by Gopinath, Kalemli-Ozcan, Karabarbounis, and Villegas-Sanchez

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AEA Meetings 2015

Static Misallocation (Quick Refresher)

$$
\begin{aligned}
y_i &= z_i \left(\frac{k_i}{\alpha}\right)^{\alpha} \left(\frac{l_i}{1-\alpha}\right)^{1-\alpha} \\
p_i &= \mu_i mc_i = \mu_i \frac{1}{z_i} R_i^{\alpha} w_i^{1-\alpha} \\
TFPR_i &= p_i z_i = \mu_i R_i^{\alpha} w_i^{1-\alpha}
\end{aligned}
$$

- $(R_i = R) + (w_i = w) + (\mu_i = \mu) \implies TFPR_i = TFPR$
- Otherwise (i.e. $R_i = R(1 + \tau_i^k)) \implies TFPR_i \neq TFPR$
- Paper is about $Var(\ln(TFPR_i)) \uparrow$ in South, but not in North

Plan for Discussion

A really nice paper!

My discussion will focus on:

1. Importance of joint distribution of productivity and wedges
2. Decomposition of $Var(\ln TFPR_i)$ into $Var(\ln MRPK_i)$ and $Var(\ln MRPL_i)$
3. Compare $TFPR_i$ dynamics in model and data

Great Data Covering Full Firm Size Distribution

- Large emphasis placed on breadth of sample
  - 99% of firms are private – much broader than Compustat
  - Match nicely with size distribution from census/Eurostat
  - Convinced me they did enormous amount of careful work

- Focus on $Var(\ln(TFPR_i))$ may overweight small firms
  - Theory says $TFPR_i = p_i z_i$ essentially scale invariant
  - $(1 + \tau_i^k)$ impacts $Var(\ln(TFPR_i))$ same for big and small
  - Why? Assumes joint multivariate log normality.

Great Data Covering Full Firm Size Distribution

- The exact expression for TFP is:

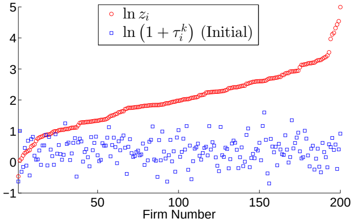
$$TFP^{\text{exact}} = \left[\sum_{i}^{N} \left(z_i \frac{T\bar{F}PR}{TFPR_i} \right)^{\sigma - 1} \right]^{1/(\sigma-1)}$$

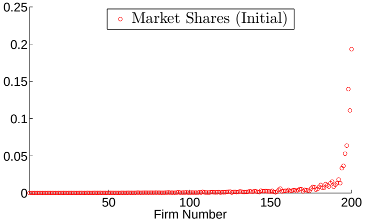
- Under joint log normality, it is:

$$\begin{aligned} TFP^{\text{approx}} &= \frac{1}{\sigma - 1} \left(\ln N + \ln \mathbb{E}\left(z_i^{\sigma-1} \right) \right) \\ &- \frac{\sigma}{2} Var\left(\ln \left(TFPR_i \right) \right) - \frac{\alpha(1-\alpha)}{2} Var\left(\ln \left(1 + \tau_i^k \right) \right) \end{aligned}$$

- Intuition?
  - Case 1: $Covar(\ln z_i, \ln(1 + \tau_i^k)) = 0$
  - Case 2: $Covar(\ln z_i, \ln(1 + \tau_i^k)) \neq 0$

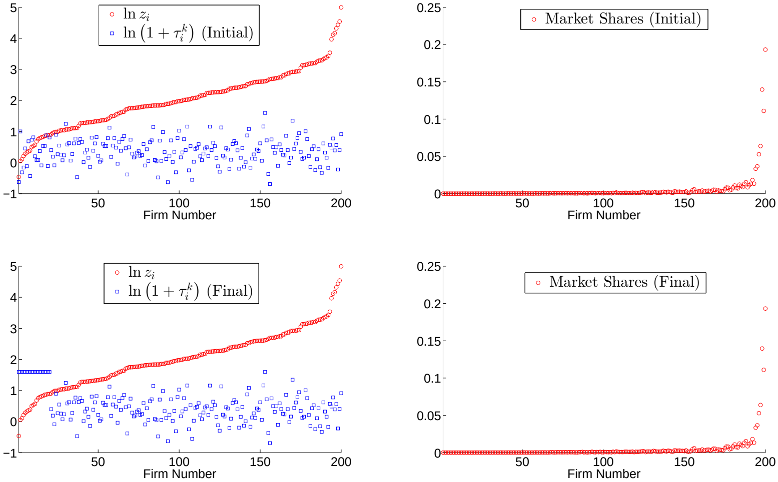
Potential to Overemphasize Small Firms





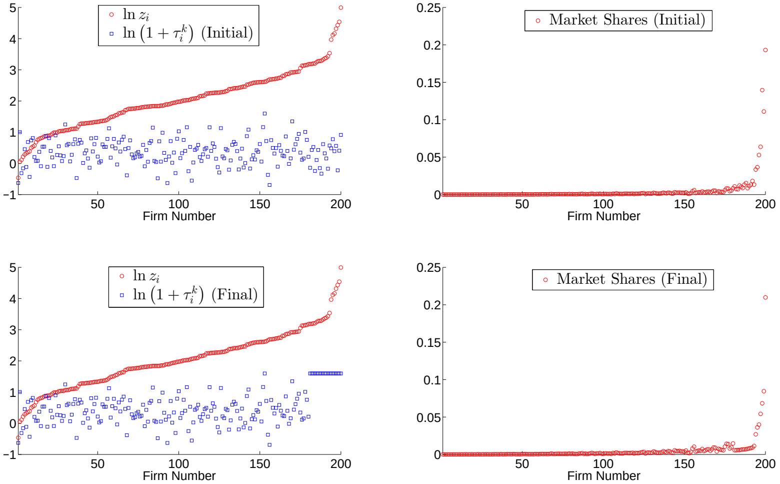
- Initial distribution is joint lognormal, $N = 200$, only τ^k, $\sigma = 3$
- Initial $5.5943 = \ln TFP^{\text{exact}} \approx \ln TFP^{\text{approx}} = 5.5980$

Potential to Overemphasize Small Firms



- Initial distribution is joint lognormal, $N = 200$, only τ^k, $\sigma = 3$
- Initial $5.5943 = \ln TFP^{\text{exact}} \approx \ln TFP^{\text{approx}} = 5.5980$
- But $-0.0001 = \Delta \ln TFP^{\text{exact}} > \Delta \ln TFP^{\text{approx}} = -0.0334$

Potential to Underemphasize Big Firms



- Initial distribution is joint lognormal, $N = 200$, only τ^k, $\sigma = 3$
- Initial $5.5943 = \ln TFP^{\text{exact}} \approx \ln TFP^{\text{approx}} = 5.5980$
- But $-0.0884 = \Delta \ln TFP^{\text{exact}} < \Delta \ln TFP^{\text{approx}} = -0.0361$

Great Data Covering Full Firm Size Distribution

- Why might this matter?
  - Measurement error bigger on small/private firms?
  - Policies and reporting incentives different? (Hsieh 2002)
  - Potentially explains sensitivity to treatment of entry/exit?
- Model has size-dependence of financial frictions and endogenously generates joint-distribution between $\ln z_i$ and $\ln(1+\tau_i^k)$.
  - What is it in model?
  - What is it in data?
- Do I suspect this is big deal? No. Examples I showed were far from zero-mean noise. Still, easy and important to check.

Split $Var(\ln TFPR)$ into $Var(\ln MRPK)$ and $Var(\ln MRPL)$

$$\ln TFPR_i = \gamma + \alpha \ln MRPK_i + (1-\alpha) \ln MRPL_i$$

- Upward trend in $Var(\ln TFPR_i)$ is clearly driven by upward trend in $Var(\ln MRPK_i)$ and not in $Var(\ln MRPL_i)$
- Surprising and interesting, suggestive of key shocks, one of coolest results in paper!
- Clear and compelling split between South and North
- Nicely motivates focus on capital in model

Split $Var(\ln TFPR)$ into $Var(\ln MRPK)$ and $Var(\ln MRPL)$

- Implies heterogeneous markups (or changes in them) aren't the story.

$$
\begin{aligned}
MRPL_i &= \frac{1}{\mu_i}\alpha\frac{p_i y_i}{l_i} \\
MRPK_i &= \frac{1}{\mu_i}(1-\alpha)\frac{p_i y_i}{k_i}
\end{aligned}
$$

  Authors should emphasize this more.

  - Peters (2013) generates what would look like misallocation in CES models with variable markups
  - Fernald and Neiman (2011) model impact of dynamic misallocation from variable markups on TFP in Singapore

- Surprising? External validity?

- Again, elevates importance of approximation...

Dynamic Model with Risk, Financial Frictions, Adj. Costs

Model (but with $b_{i,t+1} \leq \theta k_{i,t+1}$) yields user cost expression (when constraints binding):

$$
\begin{aligned}
u_{i,t} = \mathbb{E}\left[MRPK_{i,t+1}\right] \quad = \quad & (r_{t+1} + \delta) \\
& + (1-\theta)\frac{\left(1 - \mathbb{E}\left[m_{i,t+1}\right](1 + r_{t+1})\right)}{\left[m_{i,t+1}\right]} \\
& + \frac{\partial AC_{i,t}}{\partial k_{i,t+1}} \frac{1}{\mathbb{E}\left[m_{i,t+1}\right]} + \frac{\partial AC_{i,t+1}}{\partial k_{i,t+1}}
\end{aligned}
$$

- Risk, financial frictions, and adjustment costs do the work

Dynamic Model with Risk, Financial Frictions, Adj. Costs

Model (but with $b_{i,t+1} < \theta k_{i,t+1}$) yields user cost expression (when constraints binding):

$$u_{i,t} = \mathbb{E}\left[MRPK_{i,t+1}\right] = (r_{t+1} + \delta) + (1-\theta)\frac{(1 - \mathbb{E}\left[m_{i,t+1}\right](1 + r_{t+1}))}{\left[m_{i,t+1}\right]} + 0 \text{ (Without Adjustment Costs)}$$

- Risk, financial frictions, and adjustment costs do the work
- Kill Adjustment Costs

Dynamic Model with Risk, Financial Frictions, Adj. Costs

Model (but with $b_{i,t+1} < \theta k_{i,t+1}$) yields user cost expression (when constraints binding):

$$
\begin{aligned}
u_{i,t} = \mathbb{E}\left[MRPK_{i,t+1}\right] \quad = \quad & (r_{t+1} + \delta) \\
& +0 \ (\theta = 1 \text{ Implies Borrowing Unconstrained}) \\
& +0 \ (\text{Without Adjustment Costs})
\end{aligned}
$$

- Risk, financial frictions, and adjustment costs do the work

- Kill Adjustment Costs
- Kill Borrowing Constraints

Dynamic Model with Risk, Financial Frictions, Adj. Costs

Model (but with $b_{i,t+1} < \theta k_{i,t+1}$) yields user cost expression (when constraints binding):

$$
\begin{aligned}
u_{i,t} = MRPK_{i,t+1} \quad = \quad & (r_{t+1} + \delta) \text{ (If No Risk)} \\
& +0 \ (\theta = 1 \text{ Implies Borrowing Unconstrained}) \\
& +0 \text{ (Without Adjustment Costs)}
\end{aligned}
$$

- Risk, financial frictions, and adjustment costs do the work

- Kill Adjustment Costs
- Kill Borrowing Constraints
- Kill Risk

Dynamic Model with Risk, Financial Frictions, Adj. Costs

- Nice dynamics that I think are missing from much of misallocation literature
- Opportunity to use panel structure of data and relate to dynamics in model
- How persistent is a firm's TFPR in the model? In the data?

Spain's entry to Euro Zone

- Authors represent inflows to Spain with decline in interest rate. Very cool/important application.
- Even from perspective of model, didn't other important things occur in tandem?
  - Structural change? Authors capture *within* sector dispersion and explain nearly all for Spain. Very different from between-sector stories about tradable/non-tradable.
  - FX-driven relative prices?
  - Trade-induced changes in market shares?
  - VAT changes?
- How think about capital inflows to U.S. over same period? Different only due to initial conditions, or average productivity growth? Comparative statics on the model would help.

Conclusion

- Great paper! Helpful next step in misallocation literature
- Adds quantative rigor to familiar “stories” about entry into euro zone
- Can be strengthened by:
  1. Thinking more about size-wedge joint distribution,
  2. Highlighting that markups aren’t doing anything,
  3. Using model to test dynamic behavior of wedges