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)

\[ y_i = z_i \left( \frac{k_i}{\alpha} \right)^\alpha \left( \frac{l_i}{1 - \alpha} \right)^{1-\alpha} \]

\[ p_i = \mu_i m c_i = \mu_i \frac{1}{z_i} R_i^\alpha w_i^{1-\alpha} \]

\[ TFPR_i = p_i z_i = \mu_i R_i^\alpha w_i^{1-\alpha} \]

- \((R_i = R) + (w_i = w) + (\mu_i = \mu) \implies TFPR_i = TFPR\)
- 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 $\text{Var}(\ln TFPR_i)$ into $\text{Var}(\ln MRPK_i)$ and $\text{Var}(\ln MRPL_i)$
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 $\text{Var} \left( \ln(\text{TFPR}_i) \right)$ may overweight small firms
  - Theory says $\text{TFPR}_i = p_i z_i$ essentially scale invariant
  - $(1 + \tau_i^k)$ impacts $\text{Var} \left( \ln(\text{TFPR}_i) \right)$ same for big and small
Great Data Covering Full Firm Size Distribution

- The exact expression for TFP is:

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

- Under joint log normality, it is:

\[
TFP^{\text{approx}} = \frac{1}{\sigma - 1} \left( \ln N + \ln E \left( z_i^{\sigma - 1} \right) \right) - \frac{\sigma}{2} \text{Var} \left( \ln (TFPR_i) \right) - \frac{\alpha(1-\alpha)}{2} \text{Var} \left( \ln \left( 1 + \tau_i^k \right) \right)
\]

- Intuition?
  - Case 1: \( \text{Covar}(\ln z_i, \ln(1 + \tau_i^k)) = 0 \)
  - Case 2: \( \text{Covar}(\ln z_i, \ln(1 + \tau_i^k)) \neq 0 \)
Potential to Overemphasize Small Firms

- Initial distribution is joint lognormal, $N = 200$, only $\tau^k$, $\sigma = 3$
- 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 $\tau^k$, $\sigma = 3$
- 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 \( \tau^k \), \( \sigma = 3 \)
- Initial \( \ln TFP^{\text{exact}} \approx \ln TFP^{\text{approx}} = 5.5980 \)
- 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 $\text{Var}(\ln TFPR)$ into $\text{Var}(\ln MRPK)$ and $\text{Var}(\ln MRPL)$

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

- Upward trend in $\text{Var}(\ln TFPR_i)$ is clearly driven by upward trend in $\text{Var}(\ln MRPK_i)$ and not in $\text{Var}(\ln MRPL_i)$

- 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 $\text{Var}(\ln TFPR)$ into $\text{Var}(\ln MRPK)$ and $\text{Var}(\ln MRPL)$

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

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

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):

$$u_{i,t} = \mathbb{E}[MRPK_{i,t+1}] = (r_{t+1} + \delta)$$

$$+ (1 - \theta) \left( \frac{1 - \mathbb{E}[m_{i,t+1}] (1 + r_{t+1})}{m_{i,t+1}} \right)$$

$$+ \frac{\partial AC_{i,t}}{\partial k_{i,t+1}} \frac{1}{\mathbb{E}[m_{i,t+1}]} + \frac{\partial AC_{i,t+1}}{\partial k_{i,t+1}}$$

- 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):

$$u_{i,t} = \mathbb{E} [MRPK_{i,t+1}] = (r_{t+1} + \delta)$$

$$+ (1 - \theta) \frac{(1 - \mathbb{E} [m_{i,t+1}] (1 + r_{t+1}))}{[m_{i,t+1}]}$$

$$+ 0 \text{ (Without Adjustment Costs)}$$

- 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):

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

- 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):

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

- 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 quantitative 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