Discussion of
The Sources of Capital Misallocation
by Jeol David and Venky Venkateswaran

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Princeton University

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Capital misallocation

- Under certain circumstances, if the planner could statically reallocated capital across plants $i$, he would equalize:

$$\frac{VA_{it}}{K_{it}} \rightarrow MPK_{it}$$
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- In the data, Hseih and Klenow (2009) wedges:

$$\tau_{it}^K \equiv \log \frac{VA_{it}}{K_{it}}$$

are hugely dispersed across plants within industry-time periods seemingly indicating **misallocation and aggregate TFP loss**
This paper argues that the bulk of Hsieh and Klenow (2009) capital misallocation wedges:

1. cannot be explained by adjustment costs
2. are due to “other” firm-specific factors
3. this is true for both China and the US
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— an adjustment cost model can explain 80-90 percent of capital misallocation wedges across industries and countries
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I agree with the authors!
General environment

- Planner’s static allocation goal:

  $$\max U(Q; \xi) \quad \text{s.t.} \quad Q_i = Q_i(K_i, L_i, M_i; A_i)$$

- First order condition

  $$\lambda_i \frac{\partial Q_i}{\partial K_i} = \lambda_K$$

  where $\lambda_i$ is the shadow value of good $i$, $\lambda_K$ is the shadow cost of capital
General environment

• Planner’s static allocation goal:

\[
\max U(Q; \xi) \quad \text{s.t.} \quad Q_i = Q_i(K_i, L_i, M_i; A_i)
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• First order condition (violation)

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\lambda_i \frac{\partial Q_i}{\partial K_i} = \lambda_K (1 + t^K_i)
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where \( \lambda_i \) is the shadow value of good \( i \), \( \lambda_K \) is the shadow cost of capital and \( t^K_i \) is the misallocation wedge
General environment

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where $\lambda_i$ is the shadow value of good $i$, $\lambda_K$ is the shadow cost of capital and $t_i^K$ is the misallocation wedge

- Note that, in general, $t_i^K$ is not the same as $\tau_i^K$, that is:

$$\frac{VA_i}{K_i} \neq \frac{\lambda_i}{\lambda_K} \frac{\partial Q_i}{\partial K_i}$$
General environment

- Reasons for

\[
\frac{\text{VA}_i}{K_i} \neq \frac{\lambda_i \partial Q_i}{\lambda_K \partial K_i}
\]

1. Output elasticities \( \varepsilon_i^K \) and \( \varepsilon_i^M \) differ across plants
   - differences in technologies and returns to scale
   - non-constant-elasticity technologies

2. Prices that do not reflect marginal values \( (P_i/\lambda_i, P_{Ki}/\lambda_K, P_{Mi}/\lambda_M) \), e.g. due to markups or non-CES aggregation

3. Measurement error, including more broadly:
   - mismeasurement of capital due to depreciation, capacity utilization, quality
   - fixed costs and non-variable inputs
   - timing of inputs and output
General environment

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- How did empirical misallocation literature take off?!
Non-structural look at the data

- Assume value-added production in logs:

\[ y_{it} = a_{it} + \gamma[\alpha k_{it} + (1 - \alpha)\ell_{it}] \]

and capital and labor wedges

\[ \tau_{it}^k = y_{it} - k_{it} \quad \text{and} \quad \tau_{it}^\ell = y_{it} - \ell_{it} \]

1. “First-best” benchmark (both in level and in changes)

\[ y_{it}, k_{it}, \ell_{it} \propto a_{it} \quad \text{and} \quad \tau_{it}^k = \tau_{it}^\ell = 0, \]

2. No adjustment benchmark:

\[ \Delta k_{it} = \Delta \ell_{it} = 0 \quad \text{and} \quad y_{it}, \tau_{it}^k, \tau_{it}^\ell \propto a_{it} \]
Non-structural look at the data

US Compustat

Variation in levels (panel):

<table>
<thead>
<tr>
<th></th>
<th>$y_{it}$</th>
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<tbody>
<tr>
<td>$\text{var}(\cdot)$</td>
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3 Correlated wedges $\text{corr}(\tau_{it}^k, \tau_{it}^\ell) = 0.61$ and $\text{corr}(\bar{\tau}_i^k, \bar{\tau}_i^\ell) = 0.60$
Non-structural look at the data

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4 Variation in changes (time-series):

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<td>var(( \cdot ))</td>
<td>0.25</td>
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<td>0.10</td>
<td>0.21</td>
<td>0.23</td>
</tr>
<tr>
<td>corr(( y_{it}, \cdot ))</td>
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<td>0.41</td>
<td>0.77</td>
<td>0.82</td>
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More specific comments for the authors

1. Test directly the Euler equation for investment

2. More general productivity process:

\[ a_{it} = \bar{a}_i + \rho a_{i,t-1} + \mu_{it} \]

3. Hard-to-interpret decomposition:

\[ T_{it} = \gamma a_{it} + \chi_i + \varepsilon_{it} \]

4. Markup measurement assumes no misallocation of inputs

5. Technology differences limited to relative capital-labor intensity