Intergenerational Occupational Mobility and Labor Productivity

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It documents that **intergenerational occupational persistence is higher in poor countries.**

- The correlation does not depend on cross-country differences in occupational structure.

**Occupational persistence** is symptomatic of underlying **talent misallocation.**

- This paper posits a model of occupational choice and **financial frictions.**
  - Constrained workers are trapped into their fathers’ occupation.

- Misallocation of talent can cause a **factor-of-three decrease** in output per capita.
The Data

- Several data sources:
  1. European Social Survey (27 countries).
  2. NLSY79 (US).
  3. Indian Human Development Survey.

- Occupational data harmonized at the finest possible level (23 occupations ~ 2-digit ISCO).

- Population: males at least 25 years old.
$N^k = \sum_{i=1}^{N^k} \frac{I(j^k_i, j^k_i)}{N^k}$

Figure 1: Naive Persistence
Random Persistence

\[ R^k = \sum_{j=1}^{J} p^k_j p^k_{jf} \]

Figure 2: Random Persistence
Adjusted Persistence

\[ P^k = \frac{N^k - R^k}{1 - R^k} \]

**Figure 3: Explained Persistence**

- Corr: -0.7261***
Robustness Checks

- Same findings using Census data (IPUMS) for 41 countries.
- Robust to exclusion of agriculture sector.
The Model - Technology

- Representative firm that aggregates labor inputs from various occupations:

\[ Y = \left[ \sum_{j=1}^{J} (A_j H_j)^\rho \right]^{\frac{1}{\rho}} \]

- Labor markets are perfectly competitive, market clearing wages \( w_j \).
The Model - Workers

- Continuum of heterogeneous workers.
- Receive an idiosyncratic talent endowment $\epsilon = \{\epsilon_j\}_{j=1}^{J}$ in the first period, drawn from a Frechet distribution.
- Have to choose an occupation $j$ and develop human capital (borrow for education):
  \[ h_b(\epsilon, \bar{\xi}_j | j) = \epsilon_j \bar{\xi}_j^{\eta} \]
- Alternatively, they can be trained by their fathers in their occupation:
  \[ h_h(\epsilon, \bar{\xi}_f | f) = \epsilon_f (\alpha \bar{\xi}_f)^{\eta} \]
Workers have to borrow in order to fund their investments.

Perfectly competitive financial intermediary.

**Financial frictions**: a worker choosing to renege on the repayment can get away with \((1 - \phi)\) of her wage income.
The Model - Workers’ Problem (1/2)

\[ \tilde{U}_j^C(\epsilon) = \max_{c,l} \gamma \log c + \log (1 - l) \]

\[
\text{s.t.} \quad c + (1+r)\tilde{\xi}_j = w_j\epsilon_j\tilde{\xi}_j^\eta l
\]

\[ \tilde{U}_j^R(\epsilon) = \max_{c,l} \gamma \log c + \log (1 - l) \]

\[
\text{s.t.} \quad c = (1-\phi)w_j\epsilon_j\tilde{\xi}_j^\eta l
\]

- The lending follows incentive compatibility. Credit is denied when \( \tilde{U}_j^R > \tilde{U}_j^C \).
  - For a given \( \phi \), there exists a level \( \epsilon_j^* \) such that all workers \( \epsilon_j < \epsilon_j^* \) are denied funding.
  - The threshold talent \( \epsilon_j^* \) is decreasing in \( \phi \).
\[ \hat{U}(\epsilon, f) = \max_{c, l} \gamma \log c + \log (1 - l) \]

s.t. \[ c = w_j \epsilon_f (\alpha \bar{\xi}_f)^\eta l \]

- There exists a level \( \epsilon^*_f \) such that any worker \( \epsilon_f < \epsilon^*_f \) optimally chooses home-based education.
Mechanism ($\phi = 1$)

Figure 7: Optimal allocation under perfect credit markets
Mechanism ($\phi < 1$)

Figure 8: Allocation in presence of frictions

(a) Low level of frictions

(b) High level of frictions
## Calibration

### Table 1: Calibration: Estimate and Target/Source

<table>
<thead>
<tr>
<th>Parameter(s)</th>
<th>Value</th>
<th>Target/Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parameters from related literature</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\eta$: Elasticity of human capital*</td>
<td>0.40</td>
<td>Erosa et al. (2010)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manuelli &amp; Seshadri (2014)</td>
</tr>
<tr>
<td>$\rho$: Elasticity of substitution in production*</td>
<td>2/3</td>
<td>Hsieh et al. (2013)</td>
</tr>
<tr>
<td><strong>Jointly Calibrated Parameters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\theta$: Talent variance</td>
<td>3.25</td>
<td>Variance of earnings</td>
</tr>
<tr>
<td>$\gamma$: Weight on consumption</td>
<td>0.47</td>
<td>Hours worked</td>
</tr>
<tr>
<td>$\alpha$: Efficiency of home-based education</td>
<td>0.61</td>
<td>Adjusted persistence</td>
</tr>
<tr>
<td>$\xi_P$: Cost of a year of pre-tertiary schooling</td>
<td>0.003</td>
<td>Pre-tertiary Spending-to-GDP</td>
</tr>
<tr>
<td>$\xi_T$: Cost of a year of tertiary schooling</td>
<td>0.023</td>
<td>Tertiary Spending-to-GDP</td>
</tr>
<tr>
<td><strong>Occupation Specific Parameters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>{A_j}: Occupation-specific productivity</td>
<td>-</td>
<td>Distribution of workers across occupations</td>
</tr>
</tbody>
</table>
## Results

### Table 2: Productivity relative to US

<table>
<thead>
<tr>
<th></th>
<th>$\phi$ (1)</th>
<th>Relative Y (2)</th>
<th>Relative $Y/H$ (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>0.12</td>
<td>0.32</td>
<td>0.33</td>
</tr>
<tr>
<td>India</td>
<td>0.26</td>
<td>0.77</td>
<td>0.79</td>
</tr>
</tbody>
</table>

### Table 3: Decomposition

<table>
<thead>
<tr>
<th></th>
<th>Relative Y</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distribution (1)</td>
</tr>
<tr>
<td>Tanzania</td>
<td>0.99</td>
</tr>
<tr>
<td>India</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Sensitivity

- **Parental transfers**: workers can spend part of fathers’ wages. → larger negative effects on TFP (higher frictions).

- **Intergenerational transmission of talents**: workers draw from a better distribution when they are in their fathers’ occupation. → results almost unchanged.

- **Differences in Education Intensity**: education intensity parameters are country-specific. → larger decrease in TFP (education intensity alone decreases TFP by up to 30%).
Conclusions

- Occupational persistence is higher in poor countries.

- Financial frictions seem an important factor that can restrict efficient allocation of workers.

- Productivity drops by a factor of three relative to the benchmark US economy.