The importance of mismatch in schooling

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1. How to improve the movement of labor between different parts of the labor market?

2. Are mismatch problems important barriers to growth?
Introduction

But what is mismatch?
Mismatch

Mismatch from the vantage point of

▶ labor markets
  ▶ is demand finding supply?

▶ schooling
  ▶ is supply meeting demand?
Mismatch

Dimensions of mismatch:

- spatial, sectoral, occupational, educational

Causes of mismatch:

- search frictions, information, wage rigidity

Indicators of mismatch:

- persistence differences in the level of unemployment across groups
- joint existence of vacancies and unemployed

Can often also be explained by specific human capital, amenities
Mismatch

So what do we know about mismatch?

- are potential matches being made?
  - Beveridge curve
- are existing matches Pareto efficient?
  - compare schooling to job requirements
Mismatch

Beveridge Curve for Norway

Note: Quarterly data from 2000q1-2015q2. Vacancy data are taken from the OECD’s Registered Vacancies database. Estimates of unemployment and the labor force are derived from each country’s labor force survey and are available from the OECD’s Short-Term Labour Market Statistics.
Supply of skills

The education literature that studies mismatch compares:

- required schooling in the job
- actual schooling of the worker

A worker is considered to be mismatched if

- required schooling $\neq$ actual schooling

A worker is

- overschooled: required $>$ actual
- underschooled: required $<$ actual
Supply of skills

The Program for the International Assessment of Adult Competencies (PIAAC) is a large-scale study that was developed under the auspices of the Organization for Economic Cooperation and Development (OECD). The PIAAC questionnaire included an item where respondents were asked about the educational requirements of their current job. For Norway, we find that 49% is mismatched:

- 18% is overschooled
- 31% is underschooled
Supply of skills
Wage returns to (mismatched) schooling

<table>
<thead>
<tr>
<th></th>
<th>OLS</th>
<th>ORU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schooling</td>
<td>0.043***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td></td>
</tr>
<tr>
<td>Required</td>
<td></td>
<td>0.046***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.003)</td>
</tr>
<tr>
<td>Over</td>
<td></td>
<td>0.031***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.007)</td>
</tr>
<tr>
<td>Under</td>
<td></td>
<td>-0.018***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.005)</td>
</tr>
</tbody>
</table>
Supply of skills
Example matching of workers...

<table>
<thead>
<tr>
<th>Actual</th>
<th>Required</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>30 Matched</td>
</tr>
<tr>
<td>High</td>
<td>Low</td>
<td>10 Mismatched (Under)</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>30 Mismatched (Over)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 Matched</td>
</tr>
</tbody>
</table>

Mismatch rate = \( \frac{10 + 30}{100} = 0.4 \)
Supply of skills
...which can be improved by reassigning 10 workers

<table>
<thead>
<tr>
<th>Actual</th>
<th>Required</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
<td>40 Matched</td>
<td>0 Mismatched (Under)</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
<td>20 Mismatched (Over)</td>
<td>40 Matched</td>
</tr>
</tbody>
</table>

Structural mismatch rate = 20 / 100 = 0.2
We can thus decompose the observed mismatch rate:

\[ \text{Observed} = \text{Assign} + \text{Structural} \]

\[ 0.4 + 0.2 + 0.2 \]
## Supply of skills

Mismatch decomposition

<table>
<thead>
<tr>
<th>Mismatch</th>
<th>Observed</th>
<th>Assign</th>
<th>Structural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mismatch</td>
<td>0.49</td>
<td>0.23</td>
<td>0.26</td>
</tr>
<tr>
<td>Overschooled</td>
<td>0.18</td>
<td>0.05</td>
<td>0.13</td>
</tr>
<tr>
<td>Underschooled</td>
<td>0.31</td>
<td>0.18</td>
<td>0.13</td>
</tr>
</tbody>
</table>
## Supply of skills

### Wage consequences of reassignment

<table>
<thead>
<tr>
<th></th>
<th>Change in wages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>-0.5%</td>
</tr>
<tr>
<td><strong>- Mismatched</strong></td>
<td>-1.8%</td>
</tr>
<tr>
<td><strong>- Overschooled</strong></td>
<td>-7.8%</td>
</tr>
<tr>
<td><strong>- Underschooled</strong></td>
<td>+4.2%</td>
</tr>
</tbody>
</table>

*Wage specification: $(O+R+U)$ $(O+R+U)##(O+R+U)$*
Supply of skills

On face value substantial mismatch between workers schooling and job requirements

- 50% report discrepancy
  - 50% misassignment
  - 50% structural

But reassignment has little impact on average wages and mostly involves a transfer from overschooled to underschooled workers.

Therefore no evidence of productive mismatch given the skills of workers.

But do workers enter the labor market with the right skills?
Supply of skills

Post-secondary education system in Norway

- public & centralized
- selects students on high school performance
- regulates supply through enrollment

Does supply meet demand?
Supply of skills
Substantial payoffs to fields of study

Source: Kirkebøen, L., E. Leuven and M. Mogstad (2014)
Supply of skills

Student selection

The current system select students predominantly on high school performance:

- but in many fields high school GPA is a poor predictor of earnings!
  (Table 4, Kirkebøen et al. 2015)
Supply of skills
Student selection, Intermezzo

The NL selects medical school students using a lottery

Source: Ketel, Leuven, Oosterbeek & Van Der Klaauw (2015)
Supply of skills
Student sorting

Choice based on comparative advantage means

\[
\frac{inc(business)}{inc(teaching)} \mid \text{business people} > \frac{inc(business)}{inc(teaching)} \mid \text{teachers}
\]

Or: “I choose what I’m relatively good at”
Supply of skills
Evidence based on comparative advantage

\[ E[\log y^j - \log y^k | d^j_k - d^j_j = 1, d^k_{l \neq j, k} = 0] - E[\log y^j - \log y^k | d^k_k - d^j_k = 1, d^l_{l \neq j, k} = 0] \]

Source: Kirkebøen, L., E. Leuven and M. Mogstad (2014)
Supply driven reform:

- Use payoff estimates and observed choice behavior to calculate the payoff to changing capacity
Supply of skills

Changing capacity

Demand driven reform:

- drop selection based on high school grades
- introduce fees that reflect (relative) cost of enrollment
Summary

Are matches not occurring?
Little indication of mismatch of existing matches in the labor market conditional on skills
  ▶ we need more research on this topic

Reasons to expect that the supply of skills is not meeting demand
  ▶ capacity not demand driven
  ▶ selection not (relevant) skill driven

Reconsider how many we educate and who we educate
References
