Social networks in agglomerations – important questions in dual economies

Balázs Lengyel
MTA KRTK
ASNET Lendület Group
Why does the economy concentrate in space and in urban areas?

Agglomeration economies

Advantages in cities:
- Shared goods (eg. Infrastructure, higher education)
- Better matching on labor markets
- Inter-firm learning

Limited understanding on how social networks induce agglomeration economies.
Economic progress and urban success

- Social interaction: population density

- Learning in the city: industry structure

- Related knowledge is easier to learn but contains less novelty

Hidalgo et al. 2007 (Science)
Evidence from co-worker networks

Productivity growth in the region is induced not only by A-B and A-C links, but also by B-C links.

Labor mobility:
- direct effect – knowledge transfer
- indirect effect – social ties

Industry specialization and links to co-located industries

<table>
<thead>
<tr>
<th></th>
<th>PRODUCTIVITY (INCREMENTAL INNOVATION)</th>
<th>EMPLOYMENT (RADICAL INNOVATION)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>RELATED</td>
<td>0.044***</td>
<td>0.145*</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.077)</td>
</tr>
<tr>
<td>UNRELATED</td>
<td>0.043**</td>
<td>-0.024</td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td>(0.040)</td>
</tr>
<tr>
<td>SPEC</td>
<td>0.096*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.052)</td>
<td></td>
</tr>
<tr>
<td>REL x SPEC</td>
<td>-0.016*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td></td>
</tr>
<tr>
<td>UNREL x SPEC</td>
<td>0.006</td>
<td>0.009**</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.004)</td>
</tr>
</tbody>
</table>

Year FE         | Yes  | Yes  | Yes  | Yes |
R²              | 0.162 | 0.228 | 0.294 | 0.430 |
N               | 11428 | 11428 | 11428 | 11428 |

Eriksson and Lengyel (2017) Resubmitted to Economic Geography
Dual economy

“*A dual economy* is the existence of two separate economic sectors within one country, divided by different levels of development, technology, and different patterns of demand.”

Sir William Arthur Lewis (1915 – 1991)
Nobel prize in economics 1979

General trend of development:
capital accumulates in capitalist sector;
development diffuses to non-capitalist sector.
Dual economy in CEE
Spatial patterns of FDI effect

Foreign companies

Public service

Foreign firms and change in regions

Elekes, Boschma, Lengyel (2017)
Firm networks

- Small industry in a small town
- Interviews with managers
- Which firm do you ask if you need technical advice?

Analysis:
- Creation and persistence of ties
- Statistical model based on simulations

Results:
- Creation of new ties is more likely:
  1. physical proximity
  2. shared contacts
- Persistence of existing ties is more likely:
  3. technological proximity

Links between domestic and foreign-owned firms are not likely to be created.

Social networks and disparities


<table>
<thead>
<tr>
<th>Network modularity</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (log)</td>
<td>0.122***</td>
<td>-0.050</td>
<td>(-0.71)</td>
</tr>
<tr>
<td></td>
<td>(55.32)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income equality</td>
<td>0.061</td>
<td>-0.573*</td>
<td>(-2.36)</td>
</tr>
<tr>
<td></td>
<td>(1.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interaction</td>
<td>0.188*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.43)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.240***</td>
<td>0.085</td>
<td>0.285</td>
</tr>
<tr>
<td></td>
<td>(-34.39)</td>
<td>(1.62)</td>
<td>(1.28)</td>
</tr>
<tr>
<td>N</td>
<td>2,380</td>
<td>2,380</td>
<td>2,380</td>
</tr>
<tr>
<td>R2</td>
<td>0.562</td>
<td>0.005</td>
<td>0.563</td>
</tr>
</tbody>
</table>

Standard errors in parantheses. *** p<0.001, ** p<0.01, * p<0.05
Identify the firm or industry of individual cell-phone users

Telco Dataset for Hungary over 2015 individuals, calls, SMS, location

Plant and firm data from CEU Microdata

1. Matching company data to company-owned cells
2. Geo-locating the individual calls in working hours

Toole et al. 2015 JRSI.
Communication in cities and towns

Does inter-industry communication correlate with other industry networks (labor mobility, technological similarity etc.)?

Are there moduls that describe dual economy? (firm ownership, export-orientation etc.)

Schlapfer et al. (2014) RSIF

Csáfordi et al. (2017)
Communication across firm boundaries

How does links to other industries channel external information to the communication network within the firm?

Does this pattern differ across foreign vs. domestic firms; productive vs. non-productive firms?
Disparities

Does the position in the telecommunication network correlate with development levels of towns?

How does fragmentation in the network into developed and underdeveloped parts influence spatial disparities?


Thank you for your attention!

lengyel.balazs@krtk.mta.hu