Geography of Innovation and the Location of MNEs R&D Activities

INNOVA Measure Workshop
28 November 2017
Brussels, CDMA building

Davide Castellani
Henley Business School, University of Reading
d.castellani@henley.ac.uk
Outline

• Innovation is clustered in a few places in the world (‘local buzz’ argument)

• These few places need to be connected to each other (‘global pipeline’ argument)

• MNEs are privileged actors to build these pipelines, but they need to internationalise their R&D activities in geographically dispersed locations

• What are the factors that drive the location of R&D by MNEs?

• What is the right level of analysis?
The changing geography of innovation

Based on OECD Regional Innovation Dataset

- 1,482 regions (TL2 or TL3) in 39 countries, over 32 years (1980-2011)

- Median patents per million inhabitants have increased, but the cross-regional dispersion has increased even more
  - the gap between the the top innovating regions and the rest is widening
The changing geography of innovation

Based on OECD Regional Innovation Dataset

- 1482 regions (TL2 or TL3) in 39 countries, over 32 years (1980-2011)

- just **100 regions** account for **70% of patents** (and only 20% of population)
The changing geography of innovation

Based on OECD Regional Innovation Dataset
- 1482 regions (TL2 or TL3) in 39 countries, over 32 years (1980-2011)

• Co-patenting with foreign inventors is becoming more important
Geography of innovation and MNEs

- Innovation activities tend to cluster to allow more effective transfer of (mostly) tacit knowledge (‘local buzz’)
  - the importance of ‘being there’

- Local knowledge eventually needs to be integrated with knowledge external to the cluster (‘global pipelines’)

- But how knowledge is transferred in these global pipelines? How can the obstacles of ‘not being there’ be overcome?
  - MNEs can help
Geography of innovation

- MNEs are becoming orchestrators of knowledge
  - tap into diverse knowledge clusters
  - de-contextualise tacit knowledge
  - transfer it within the MNE and across space

- Create connections between clusters (global pipelines) and share tacit knowledge across locations despite of geographical distance

- But they ‘need to be there’ through their international R&D activities
Still we know relatively little on internationalisation of R&D

- Bernhard Dachs will tell us more about the patterns and trends in internationalisation of R&D across countries
- Giacomo Damioli will tell us about characteristics of regions (within countries) that attract international R&D and territorial competition to attract R&D FDI
- Sara Amoroso will tell us about the effects of R&D FDI on the host economies
Areas for future research

- is there a trade-off between
  - dispersing R&D to exploit external agglomeration economies
  - keeping R&D close to production (and other activities) to exploit intra-firm agglomeration?

- what is the right level of geographical disaggregation for studying location (and effects) of international R&D?
  - countries, regions, cities?
Internationalisation of R&D

7,788 projects in R&D or Design, Development and Testing in 1,621 cities worldwide
Source: fDi Markets
Geographical concentration of R&D FDI

Few locations for R&D activities
Only 1,600 cities receive at least one R&D FDI vs. over 6,500 for manufacturing FDIs
Geographical concentration of R&D FDI

60% of international R&D FDI projects in only 100 cities
Geographical concentration of R&D FDI

The same 100 cities account for 45% of world population.
Geographical concentration of R&D FDI

Much less concentration of manufacturing FDI
# Distance and R&D FDI

Table 2 – **Average distance** between city of origin and city of destination

<table>
<thead>
<tr>
<th></th>
<th>Global Cities</th>
<th>Metro area of global cities</th>
<th>Moderate global cities</th>
<th>Peripheral cities</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coordination</strong></td>
<td>7,839</td>
<td>6,709</td>
<td>6,617</td>
<td>6,538</td>
<td>7,316</td>
</tr>
<tr>
<td><strong>R&amp;D-related</strong></td>
<td>8,312</td>
<td>7,363</td>
<td>8,605</td>
<td>6,601</td>
<td>7,771</td>
</tr>
<tr>
<td><strong>Production</strong></td>
<td>6,481</td>
<td>5,948</td>
<td>5,769</td>
<td>5,494</td>
<td>5,707</td>
</tr>
<tr>
<td><strong>Support Svcs.</strong></td>
<td>7,153</td>
<td>5,833</td>
<td>6,227</td>
<td>5,214</td>
<td>6,033</td>
</tr>
<tr>
<td><strong>Advanced Svcs.</strong></td>
<td>7,024</td>
<td>6,130</td>
<td>5,886</td>
<td>5,193</td>
<td>6,489</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>7,122</td>
<td>6,198</td>
<td>6,223</td>
<td>5,484</td>
<td>6,347</td>
</tr>
</tbody>
</table>

**Coordination:** Headquarters

**Support svcs:** Customer centers, Logistics, Maintenance, Technical support

**R&D-related:** R&D, Design, Development and Testing

**Production:** Manufacturing, Construction, Extraction

**Advanced svcs:** Business svcs, Sales and Marketing
Concluding remarks

- The increasing concentration of innovative activities goes hand in hand with the need for MNEs to internationalise their R&D.

- MNEs need to locate their R&D in few innovative clusters around the world.

- Studying international R&D implies studying those fine level of geographical disaggregation.

- MNEs may need to cover long distances to be close to knowledge clusters.

- MNEs may face a trade-off between dispersing R&D to locate close to knowledge clusters or keeping R&D close to their production to preserve intra-firm linkages.