Drivers for International Innovation Activities in Developed and Emerging Countries

Anja Schmiele

ZEW- Centre for European Economic Research
Mannheim, Germany
Research Questions

– **Which role do**
  - internal firm resources and capabilities
  - the competitive environment
  - (dis)advantages in the national innovation system
  *play as drivers to internationalize innovation activities of firms?*

– **How do these determinants differ by type of innovation activity performed abroad?**
  - R&D
  - Design
  - Product innovation
  - Process innovation
  - Sales of new products

– **How do these determinants differ by host country and countries with different levels of knowledge development?**
  - Asian countries, Eastern Europe, Western Europe, North America, Advanced ~, Follower~ and Marginalized countries (Castellaci and Archibugi, 2008)
Internationalisation of R&D

- **Motives for the Internationalisation of innovation processes**
  (Granstrand et al., 1993; Dunning, 1994; Pearce 1999; Le Bas and Sierra, 2002)
  - Market / Knowledge / Efficiency seeking

- **Role of foreign subsidiary in the global innovation process**
  (Ito and Wakasugi, 2007; Kuemmerle, 1997; Nobel and Birkinshaw, 1998)
  - Support-oriented R&D; knowledge sourcing
  - Home-base exploiting, Home-base augmenting

- **OLI-Model as theoretic concept for internationalisation**
  (Dunning and Lundan, 1998)
  - Organisational, Locational, Internalisational advantages

- **Ressource Based View / Knowledge Based View of the Firm**
  (Barney, 1991; Conner, 1991; Peteraf, 1993; Wernerfelt, 1984; Grant, 1996)
  - Knowledge as competitive advantage and capability
  - In-house knowledge as requirement to absorb new knowledge
    (Cohen & Levinthal, 1990)
Geographic Scope of R&D abroad

• National path of innovation internationalisation (Ambos, 2005), moderated by cultural, technological and geographic distance (liabilities of foreignness)

• New markets and fast emerging countries change and foster the geographical scope of international R&D (Sachwald, 2008)

• Firms look for attractive market potential, qualified staff and cooperation partners (Thursby and Thursby, 2006)

• UNCTAD survey (2005) about future R&D locations of firms, 62% China, 41% USA, 29% India

• Little empirical research about innovation activities in Developing countries.
Drivers to International R&D

Internal Resources
- Absorptive Capacities
- International Experience
- Financial Resources
- Experienced Usage of IPR
- Technological Advantage

Competitive Environment
- Competition Intensity
- Price Competition
- Competition due to New Market Entries

Innovation Barriers in Germany
- Lack of technical knowledge
- High innovation costs
- Lack of external financial sources
- Lack of Labour
- Lack of Innovation Partners
- Regulation as barrier
- Lack of customer response

Start/Expansion of Innovation activities abroad
- Asia / North America / Western Europe / Eastern Europe
- Developed Countries / Developing Countries

Start/Expansion of Innovation activities:
- R&D
- Construction
- Conception
- Design
- Production of new Products
- Implementation of new Processes
Data

- Mannheim Innovation Panel (MIP), wave 2005 and 2006
- Model 1 – Sample: Innovative Firms vs. innovative Firms with R&D abroad
- Model 2 – Sample: Firms with R&D abroad vs. Firms with R&D in specific countries

MIP 2005
- Internal Resources
- Innovation barriers
- Competitive Environment

MIP 2006
- International Innovation activities
  ➔ planned start / expansion in 2006/07

Sample: Model 1 ~ 1.200 innovative firms | Model 2 = 705 innovative firms
<table>
<thead>
<tr>
<th>Variables</th>
<th>Planned Research Abroad</th>
<th>Planned Design/Conception Abroad</th>
<th>Planned Manufacturing Abroad</th>
<th>Planned New Processes Abroad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous Inhouse R&amp;D</td>
<td>0.044 ***</td>
<td>0.034</td>
<td>0.009</td>
<td>0.011</td>
</tr>
<tr>
<td>High skilled employees</td>
<td>0.056 **</td>
<td>0.016</td>
<td>0.044</td>
<td>-0.028</td>
</tr>
<tr>
<td>Innovation coop. with intl. Partners</td>
<td>0.015</td>
<td>0.006</td>
<td>0.058 *</td>
<td>0.023</td>
</tr>
<tr>
<td>Export experience</td>
<td>0.044 ***</td>
<td>0.087 ***</td>
<td>0.102 ***</td>
<td>0.057 ***</td>
</tr>
<tr>
<td>Experienced usage of IPR</td>
<td>0.011</td>
<td>0.015</td>
<td>0.049 **</td>
<td>0.027 *</td>
</tr>
<tr>
<td>Financial Resources</td>
<td>0.009</td>
<td>0.016</td>
<td>0.044 **</td>
<td>0.005</td>
</tr>
<tr>
<td>Technological advantage</td>
<td>0.026 *</td>
<td>0.034 *</td>
<td>-0.002</td>
<td>0.015</td>
</tr>
</tbody>
</table>

No. of Observations  1196  1192  1194  1187  
Pseudo R-squared     0.21  0.12  0.19  0.29
## Model 2: Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>China</th>
<th>India</th>
<th>China Asia</th>
<th>East EU</th>
<th>NA</th>
<th>West EU</th>
<th>Advanced</th>
<th>Followers</th>
<th>Marginalized</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal Resources &amp; Capabilities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous Inhouse R&amp;D</td>
<td>-0.008</td>
<td>0.004</td>
<td>0.003</td>
<td>0.052 **</td>
<td>0.000</td>
<td>0.025</td>
<td>0.001</td>
<td>0.076 **</td>
<td>0.011</td>
</tr>
<tr>
<td>High skilled employees</td>
<td>-0.084 ***</td>
<td>-0.063 *</td>
<td>-0.048</td>
<td>-0.024</td>
<td>0.003</td>
<td>0.031</td>
<td>0.022</td>
<td>-0.059</td>
<td>-0.042</td>
</tr>
<tr>
<td>Innovation coop. with intl. Partners</td>
<td>0.045 *</td>
<td>0.056 *</td>
<td>0.068 *</td>
<td>-0.005</td>
<td>0.002</td>
<td>0.014</td>
<td>0.009</td>
<td>0.130 **</td>
<td>0.048</td>
</tr>
<tr>
<td>Export experience</td>
<td>0.018 *</td>
<td>0.032 **</td>
<td>0.037 **</td>
<td>0.020</td>
<td>0.009</td>
<td>-0.028</td>
<td>0.001</td>
<td>0.016</td>
<td>0.031 **</td>
</tr>
<tr>
<td>Experienced usage of IPR</td>
<td>-0.006</td>
<td>-0.011</td>
<td>-0.004</td>
<td>0.013</td>
<td>0.004</td>
<td>0.011</td>
<td>0.029 *</td>
<td>0.045</td>
<td>-0.008</td>
</tr>
<tr>
<td>Financial Resources</td>
<td>0.007</td>
<td>0.008</td>
<td>0.001</td>
<td>-0.023</td>
<td>0.003</td>
<td>0.017</td>
<td>0.002</td>
<td>-0.004</td>
<td>0.019</td>
</tr>
<tr>
<td>Technological advantage</td>
<td>0.037 **</td>
<td>0.052 **</td>
<td>0.061 **</td>
<td>-0.031</td>
<td>0.032 **</td>
<td>0.001</td>
<td>0.029</td>
<td>0.046</td>
<td>0.045 **</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. of observations</th>
<th>705</th>
<th>705</th>
<th>705</th>
<th>705</th>
<th>705</th>
<th>705</th>
<th>705</th>
<th>705</th>
<th>705</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudo R-squared</td>
<td>0.26</td>
<td>0.22</td>
<td>0.20</td>
<td>0.07</td>
<td>0.21</td>
<td>0.12</td>
<td>0.11</td>
<td>0.09</td>
<td>0.18</td>
</tr>
</tbody>
</table>
Conclusions

• **Firm capabilities** show positive impact on the decision to perform different innovation activities abroad as well as they have influence on the location of the R&D labs abroad.

• **International Experience** is essential for firms deciding to innovate abroad.

• **Innovation barriers** in the home country only drive the decision to locate low R&D-intensive activities (manufacturing of innovative products abroad)

• Firm size effect R&D internationalisation and location decision positively.

• **R&D internationalisation is a sign of corporate strength** and a way to further capitalize and increase the technological advantage. There is no sign that firms move their innovation activities abroad to overcome innovation disadvantages in the home country.