

Drivers for International Innovation Activities in Developed and Emerging Countries

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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, International 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



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 Ressources
- Innovation barriers
- Competitive Environment
- ➔ In the year 2004

MIP 2006

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

Sample: Model 1 ~ 1.200 innovative firms | Model 2 = 705 innovative firms

| Variables | Planned Research Abroad | Planned Design/ Conception Abroad | Planned Manu- facturing Abroad | Planned New Processes Abroad |
|--------------------------------------|------------------------------------|--|---|---|
| Continuous Inhouse R&D | 0.044 *** | 0.034 | 0.009 | 0.011 |
| High skilled employees | 0.056 ** | 0.016 | 0.044 | -0.028 |
| Innovation coop. with intl. Partners | 0.015 | 0.006 | 0.058 * | 0.023 |
| Export experience | 0.044 *** | 0.087 *** | 0.102 *** | 0.057 *** |
| Experienced usage of IPR | 0.011 | 0.015 | 0.049 ** | 0.027 * |
| Financial Ressources | 0.009 | 0.016 | 0.044 ** | 0.005 |
| Technological advantage | 0.026 * | 0.034 * | -0.002 | 0.015 |

| | | | | |
|---------------------|------|------|------|------|
| No. of Observations | 1196 | 1192 | 1194 | 1187 |
| Pseudo R-squared | 0.21 | 0.12 | 0.19 | 0.29 |

Model 2: Results

| Variables | China | IndiaChina | Asia | EastEU | NA | WestEU | Advanced | Followers | Marginalized |
|---|------------|------------|----------|----------|----------|--------|----------|-----------|--------------|
| <i>Internal Ressources & Capabilities</i> | | | | | | | | | |
| Continuous Inhouse R&D | -0.008 | 0.004 | 0.003 | 0.052 ** | 0.000 | 0.025 | 0.001 | 0.076 ** | 0.011 |
| High skilled employees | -0.084 *** | -0.063 * | -0.048 | -0.024 | 0.003 | 0.031 | 0.022 | -0.059 | -0.042 |
| Innovation coop. with intl. Partners | 0.045 * | 0.056 * | 0.068 * | -0.005 | 0.002 | 0.014 | 0.009 | 0.130 ** | 0.048 |
| Export experience | 0.018 * | 0.032 ** | 0.037 ** | 0.020 | 0.009 | -0.028 | 0.001 | 0.016 | 0.031 ** |
| Experienced usage of IPR | -0.006 | -0.011 | -0.004 | 0.013 | 0.004 | 0.011 | 0.029 * | 0.045 | -0.008 |
| Financial Ressources | 0.007 | 0.008 | 0.001 | -0.023 | 0.003 | 0.017 | 0.002 | -0.004 | 0.019 |
| Technological advantage | 0.037 ** | 0.052 ** | 0.061 ** | -0.031 | 0.032 ** | 0.001 | 0.029 | 0.046 | 0.045 ** |

| | | | | | | | | | |
|---------------------|------|------|------|------|------|------|------|------|------|
| No. of observations | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 | 705 |
| Pseudo R-squared | 0.26 | 0.22 | 0.20 | 0.07 | 0.21 | 0.12 | 0.11 | 0.09 | 0.18 |

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