Innovation performance from a network perspective: IT industry in Szeged

János Gyurkovics
Lecturer
University of Szeged
Faculty of Economics and Business Administration

Introduction

• Mode of innovation: linear $\rightarrow$ interactive

• Access to external knowledge is crucial for firms’ innovation activities (Powell et al. 1996, Bathelt et al. 2004)

• Firms’ embeddedness in knowledge networks is decisive for their economic success (Uzzi 1996, Cantner-Graf 2004)

• Emergence of network approach + analytical tools
Innovation + network characteristics

Importance of interactions

Few empirical researches dealing with the characteristics of linkages

• **Relation** (correlation) between network position and innovation performance (Boschma - Ter Wal 2007, Quimet et al. 2004, Graf 2006, Giuliani 2007)

• Few researches deal with **causality** (Schilling - Phelps 2007, Ahuja 2000)

• **Causality** between innovation and network characteristics are vague (Fritsch 2001)
Aim #1

Investigate the effect of network position on firms’ innovation performance
Innovation + network characteristics + absorptive capacity

• Innovation performance of firms = internal innovation capacity + structure of external connections (Doloreux 2002)

• In firms’ innovation activities external knowledge complements internal resources (Powell et al. 1996)

• Boschma - Ter Wal (2007): absorptive capacity doesn’t have a direct impact on innovation performance

• Giuliani - Bell (2005): absorptive capacity influences the flow of innovation related knowledge and network position
Aim #2

Investigate whether the internal resources of firms or the level of accessibility to external knowledge has a more significant effect on innovation performance.
Knowledge network vs. social network

- Economic processes are **embedded** in social relations (Granovetter 1985)

- Personal/social proximity positively influences the creation of research collaborations (Broekel - Boschma 2012, Huber 2012; Balland et al. 2013)

- Personal/social proximity has a **positive effect** on innovation outputs (Balland et al. 2013)

- „Personal and social proximities that lead to a personal relation between individuals in different organisations can, in turn, be the base for generating business relations” (Romero 2018, pp. 26)
Aim #3

Investigate whether network position in the social or knowledge network has greater influence on the innovation performance.
Data collection and methodology

• IT industry:
  • 5829 (Other software publishing),
  • 6201 (Computer programming activities),
  • 6202 (Computer consultancy activities),
  • 7219 (Other research and experimental development on natural sciences and engineering)

• Headquarter in Szeged

• >2 employee

• Online questionnaire (ongoing) ~98 companies

• 3 research dimensions: innovation performance, absorptive capacity, social and knowledge network
Data collection and methodology

- **Innovation performance**: questions based on CIS
- **Absorptive capacity**: firm’s level of prior knowledge (Cohen - Levinthal 1990) → stock of knowledge → four dimensions based on Giuliani - Bell (2005):
  - the level of technical education of the technical personnel
  - the number of years of experience in the sector of the technical personnel
  - the number of former employers in the sector of the technical personnel
  - level of experimentation
- **Networks**: roster-recall method (KN-technical advice, SN-friendship)
- **Planned method**: PLS-SEM
Knowledge network

Colour: innovation activity based on net revenue

Node size: degree

<table>
<thead>
<tr>
<th>Nodes</th>
<th>Edges</th>
<th>Components</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>47</td>
<td>7</td>
<td>0.05</td>
</tr>
</tbody>
</table>

- Green: No innovation activity
- Orange: New to enterprise
- Blue: New to market
- Purple: N/A
Social network

Colour: innovation activity based on net revenue

Node size: degree

<table>
<thead>
<tr>
<th>Nodes</th>
<th>Edges</th>
<th>Components</th>
<th>Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>39</td>
<td>14</td>
<td>0.038</td>
</tr>
</tbody>
</table>

- Green: No innovation activity
- Blue: New to market
- Orange: New to enterprise
- Purple: N/A
Thank you for your attention!

gyujan@eco.u-szeged.hu