Contents:

1. Background
2. Theoretical framework
3. Case study on China
4. Conclusion
1. Background

- Strengthening companies’ innovation capabilities is regarded as the cure for the current economic downturn (OECD, 2010);
- Cultivating a benign environment for companies’ innovation activities is top task for public sectors on different levels;
- Decentralisation has endowed local governments more autonomies in organising their local economic activities
Traditional innovation studies had overwhelmingly concentrated on private sectors: companies’ size; entrepreneurship; industrial sectors etc.

Whereas the relational-return in economic geography welcomes a growing attention to the role of institutional factors and social capital;

‘Learning region’; ‘innovation milieu’; ‘third Italy model’; ‘local buzz’; and ‘innovation system’
2. Theoretical framework

- ‘Innovation system’ refers to a collection of private and public actors, whose interactions would stimulating the processes of initializing, learning and diffusing economically useful knowledge. (Freeman, 1987);

- First emerged on the national level (NIS) (Lundvall 1992; Nelson 2000) by tracing the economic performance of the UK, US, Japan;

- The growing internationalisation process, and its reinforced effect on regional concentration of economic activities further fashioned the idea of regional innovation system (RIS)
Now the momentum towards decentralisation and localism in many countries should have directed attention towards the local configuration of innovation activities (LIS);

Which nevertheless, is not the case so far. RIS assumes that the local level innovation activities could be completely incorporated into the regional level.

Furthermore, the cross-level innovation activities and resource flows between LIS, RIS, NIS are also less explored;

These ignorance could be problematic as the innovation activities are analysed within a semi-closed geographical space.
Figure 1 The relationship between NIS, RIS, and LIS
ISs on different geographical levels will have different ‘fitness’ for supporting companies’ innovation activities and meeting their needs, a phenomenon that has not been fully explored before.

On the macro-level, the fitness of an IS could be reflected by the overall innovation performance of its components in both private and public domains.
3. Case study on China

- **Methodology**
  - **Fitness of ISs**: approached by their industry productivities but not their overall innovation activities
  - **LIS**: represented by the national-level science parks (SPs) in this country (By 2009, there were 54 national-level SPs hosted by 29 provinces)
  - **RIS**: The provinces or municipalities (major cities) that host these SPs
  - **NIS**: national average data.
  - China Science & Technology Statistics (STS 2011), National Bureau of Statistics (2011) and 138 company survey in one SP were the main data sources
• Two composite indexes were calculated:
  (a) Productivity comparison between RIS and NIS (vertical axis);
  (b) Productivity comparison between LIS and RIS (horizontal axis)
  (C) The multiplication between these two indexes gave the productivity comparison between LIS and NIS

Figure 2 The relation between national, regional, and local innovation systems
Figure 3 Fitness comparisons between national, regional, and local innovation systems

Note: 1. **RIS > NIS > LIS**; **LIS > RIS > NIS**; **NIS > RIS > LIS**;  
      **NIS > LIS > RIS**; **LIS > NIS > RIS**

2. No data available for Tibet and Qinghai;
Table 1 Fitness comparison between national, regional, and local innovation systems

<table>
<thead>
<tr>
<th>Quadrants</th>
<th>Features (‘&gt;’ means better fit)</th>
<th>Provinces</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Metropolitan scale innovative hubs</td>
<td>RIS &gt; NIS &gt; LIS</td>
<td>Beijing, Tianjin</td>
</tr>
<tr>
<td>II. Bottom-up innovation regions</td>
<td>LIS &gt; RIS &gt; NIS</td>
<td>Shanghai, Fujian, Jiangsu, Guangdong, and Hainan</td>
</tr>
<tr>
<td>III. Established local innovation spots</td>
<td>LIS &gt; NIS &gt; RIS (upper right of curve)</td>
<td>Jilin, Zhejiang, Anhui, Shandong, Chongqing, Yunnan</td>
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<tr>
<td>IV. Emerging local innovation spots</td>
<td>NIS &gt; LIS &gt; RIS (lower left of curve)</td>
<td>Hebei, Shanxi, Liaoning, Heilongjiang, Jiangxi, Henan, Hubei, Hunan, Guangxi, Sichuan, Guizhou, Shaanxi, Gansu, Xinjiang</td>
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<td>V. Allocated growth regions</td>
<td>NIS &gt; RIS &gt; LIS</td>
<td>Inner Mongolia</td>
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</tbody>
</table>
4. Conclusion

- Previous simplistic assumptions on either competitiveness or embeddedness view of innovation systems should be refreshed;

- As each layers’ innovation systems are partially independent and partially embedded with each other, it is highly likely that systematic fitness or synergy between different levels’ ISs would vary as well.
In China, it was found that provinces in China have clustered into five sub-groups. While the coastal regions generally had a better fitted RISs and LISs, the hinterland regions were largely over-shadowed by the influence of the NIS of China;

Nevertheless, the SPs in these hinterland regions have built on their synergy as fertile land for companies’ innovation activities;

A place’s economic strength and administrative power and autonomy are among the most crucial factors that could impact the relative fitness of ISs on different geographical levels
The end

Thank you

Any questions?