Agglomeration and Innovation: Across Industries and Geographical Scales

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Introduction
This research compares the effect of agglomeration on innovation across 34 groups of interrelated industries as defined by Delgado, Porter, and Stern (2014) and searches for their optimal spatial scales that maximize such effect.

Focusing on the state of Maryland, 2004-2013, I find that

- The effect of agglomeration on innovation varies significantly across industries.
- The optimal scale of agglomeration is one mile in radius for most industries.

Data
Match two datasets for the state of Maryland, 2004-2013:
- 1.5m establishment data from Quarterly Census of Employment and Wages
- 10,355 Patent data (with citation) from United States Patent and Trademark Office

A firm is defined as locating in agglomerations if employment density in related industries is above median in a buffer around this firm.

Methods
- Estimate the effect of agglomeration on innovation with continuous quantile estimator (Combes et al., 2012)

Results

<table>
<thead>
<tr>
<th>Optimal scale (mile in radius)</th>
<th>Effect on innovation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>Local optimal</td>
</tr>
<tr>
<td>-5</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Global optimal</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
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<tr>
<td>15</td>
<td></td>
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<tr>
<td>20</td>
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</tbody>
</table>

• Search for the optimal geographical scale of agglomeration to maximize its effect on innovation

Discussion

- Face-to-face human interaction is what’s important for innovation in agglomerations.
- Agglomerations do not encourage innovation in all industries.

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Selected publications:
Fang, L., Tian, C. Housing and Marital Matching: A Signaling Perspective. China Economic Review (Forthcoming).