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The Geographic Scale of Agglomeration Externalities

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'Resurgence' of Economic Geography

- Increasing interest in the questions why firms locate in particular areas and which spatial conditions cause more than proportional economic growth
- Extensive empirical literature of how the spatial concentration of economic activities augments economic growth (e.g., Glaeser 1992, Henderson 1995)
- In this respect, agglomeration externalities are by many researchers considered to be the origin of the uneven distribution and growth of economic activities across regions

Agglomeration Externalities

- Cost-saving benefits or productivity gains external to a firm, from which a firm can benefit by being located at the same place as one or more other firms
- Uncontrollable for a single firm
- Immobile or spatially constrained

Agglomeration Externalities

- Localization Externalities
 - Agglomeration externalities stemming from concentration of specialized economic activities, internal to industry or sector
- Urbanization Externalities
 - Agglomeration externalities stemming from market size, external to industry or sector
- Jacobs Externalities
 - Agglomeration externalities stemming from local diversity, external to industry or sector

Many Empirical Studies, Different Findings

Paper	Key Finding
Moomaw (1982, 1983), Nakamura (1985), Calem and Carlino (1991)	Urbanization
Nakamura (1985), Henderson (1986), Sveikauskas (1988), Henderson et al (1995), Rosenthal-Strange (2001) Henderson (2003a)	Localization
Glaeser et al (1992)	Diversity

Source: Rosenthal & Strange (2004)

Lack of robustness across studies implies that the different economies can exist next to each other and that not per definition one type of agglomeration externality leads to more concentration or economic growth than the other.

Problems with Comparability

- Differences in methodology and measurement across studies
- Context-specificity of agglomeration externalities
- Scale-dependency of agglomeration externalities

Methodology and Measurement

- Empirical studies differ in the way they operationalize economic growth and agglomeration externalities
- Use of different control variables
- Use of different geographic scales of analysis (ranging from neighborhoods to states)

Context-Specificity

- Nonetheless, empirical outcomes also appear to be inconsistent and non-robust within studies or across studies that use a similar measurement and methodology
- Agglomeration externalities related to different types of economic growth (Frenken et al. 2007)
- Agglomeration externalities contingent on:
 - Industry (Nature of Product, Knowledge-intensiveness)
 - Time (Stage in Life Cycle of Industry, Economic Cycle)
 - Geographical Area (Shape of Urban System, Infrastructure, Demography, Institutions, Spatial Policy)

Scale-Dependency

- Agglomeration externalities may differ with respect to their reach and the scale on which they are present
- Discussion of agglomeration externalities starts off with idea that geographical proximity to other economic actors takes in a number of key advantages.
- However, scale and scope badly operationalized in empirical models

Scale-Dependency

- Traditional: functional region unit of observation
- The choice of this level as spatial unit of analysis is however completely arbitrary and foremost a result of data limitations.
- Other problems:
 - Agglomeration externalities may well reach beyond the regional level or be present at a lower scale
 - Most often agglomeration externalities are treated as spatially fixed (agglomeration externalities as club good); this is unsatisfactory
 - Neglects the possible availability of agglomeration externalities at different spatial scales

Scale-Dependency

To summarize:

- The spatial scope of agglomeration externalities remains opaque
- Moreover, their effects seem to depend on the spatial scale they are studied
- It is the geographical scale and scope of agglomeration externalities that will be the focus of our analysis (holding sector, time, area, and measurement constant)

Data

- Aggregated plant-level data on employment (N= \pm 647,000, 5-digit sectors (SIC))
- Three spatial levels of analysis
 - Municipality (N=483, \pm 70 km²)
 - Economic Geographic Regions (N=129, \pm 264 km²)
 - Functional Region (N=40, \pm 850 km²)
- Spatial autoregression to evaluate scale and scope of agglomeration externalities

Very Preliminary Outcomes

Dependent Variable: Absolute Employment Growth (1996-2004), estimated with constant, control variables (wage, competition, investments), controlled for fixed and random effects, and spatial dependency. To account for the problem of endogeneity, we use lagged levels of past conditions (1996 conditions)

Textiles & Apparel		
	Municipality	Functional Region
<i>Localization Externalities</i>	++	--
<i>Urbanization Externalities</i>	--	+
<i>Jacobs Externalities</i>	0	0

Consumer Electronics		
	Municipality	Functional Region
<i>Localization Externalities</i>	++	--
<i>Urbanization Externalities</i>	--	+
<i>Jacobs Externalities</i>	0	0

Synthesis

If agglomeration externalities turn out to be scale- and scope-dependent:

- Re-evaluate the external validity of past studies on agglomeration externalities
- Focus on the micro-foundations of agglomeration externalities (network analysis)
- Take the firm or plant seriously by taking it as unit of analysis (multilevel analysis)