

THE GEOGRAPHY OF KNOWLEDGE FLOWS

CONCEPTUAL FOUNDATIONS FOR THEME 1

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THEME ONE:

SOCIAL DYNAMICS OF INNOVATION

- **Primary H:** the economic and creativity performance of city-regions depends on
 - Strength of local knowledge circulation ***within sectors***
 - Strength of local knowledge circulation ***between sectors*** (local knowledge diversity)
 - Strength of knowledge-based linkages ***between local and non-local actors*** (geographical knowledge diversity)

THEME ONE:

TWO KEY QUESTIONS

1. What determines the strength of local knowledge circulation?
 - Diversity or specialization
 - Different types of diversity
2. What determines the strength of knowledge-based linkages ***between local and non-local actors***
 - When are non-local flows likely to be strong, effective?

QUESTION ONE:

STRENGTH & NATURE OF LOCAL KNOWLEDGE FLOWS

- Power of **specialization**
 - Localization economies: external to a firm but internal to an industry (Marshall-Arrow-Romer externalities)
 - Emphasis on common labour pool, skill base, specialized suppliers, educational institutions, other industry-specific complementary assets
 - Lower cost of supplies
 - Greater efficiencies from specialization
 - Knowledge-based advantages: learning by doing, knowledge spillovers are facilitated by specialization
 - Key mechanisms for local knowledge circulation
 - Intra-sector mobility of specialized labour, serial entrepreneurs
 - Learning by observing (density/concentration effects)

QUESTION ONE:

STRENGTH & NATURE OF LOCAL KNOWLEDGE FLOWS

- Benefits of **diversity**
 - Jacobs (1969): new ideas formed by combining older ideas, or by applying knowledge that is 'routine' in one sector to problems in another sector (in which the same knowledge is 'revolutionary')
 - richness of large, diverse urban economies
 - Mixing of many different industries, occupations
 - Potential for knowledge transfer between industries
 - market exchanges and spillovers
 - Intended and accidental
 - Diverse city-regions should
 - grow faster than more specialized ones
 - have higher levels of innovative dynamism
 - be more likely to generate radical innovations

QUESTION ONE:

STRENGTH & NATURE OF LOCAL KNOWLEDGE FLOWS

- **Related variety**

- Frenken, van Oort, Verburg, and Boschma (2004)
- Unrelated variety provides some protection against external shocks and job loss (portfolio effect)
- Related variety (i.e. complementarity between sectors) may spur job growth
- Complementary sectors: vertically linked (different but related)
- Knowledge-based interpretation
 - Nooteboom: optimal cognitive distance
 - Overlapping knowledge bases
- Knowledge spills over more readily – and with a **bigger payoff** – between sectors that are ‘related’ to one another

QUESTION ONE:

STRENGTH & NATURE OF LOCAL KNOWLEDGE FLOWS

- Glaeser (2000):

“In this [new] body of research, cities are thought of as informational entities that exist to speed the flow of learning and knowledge.” (p. 84)

“My hope is that by investigating the actual hard evidence on innovations, we will be able to assess the relative importance of idea combinations and the role of diversity and concentration.” (p. 92)

QUESTION TWO:

LOCAL & **NON-LOCAL** KNOWLEDGE FLOWS

- Canonical view: ‘proximity matters’ for innovation
 - Learning through interacting (social process)
 - Interaction between firms and other firms, institutions of education and research
- Spatial proximity facilitates the sharing of knowledge and the capacity for localized learning by firms
 - Traded and untraded flows
 - Tacit and codified knowledge
 - Verbal and non-verbal communication: F2F, buzz
 - Common conventions, norms
 - Readily available knowledge about reliability, reputation, trustworthiness of potential suppliers, partners, customers

INNOVATION AND KNOWLEDGE: AN ALTERNATIVE PERSPECTIVE

- Local self-sufficiency: unrealistic, undesirable
- Local 'buzz' and global 'pipelines' (Owen-Smith & Powell 2004; Bathelt et al 2004)
 - Local innovative dynamism (also) depends on local actors' ability to establish channels, networks to access knowledge from *distant* centres/nodes of knowledge production
 - From an evolutionary perspective, pipelines increase variety of locally available knowledge by linking firms to multiple selection environments, knowledge pools – i.e. *non-local learning has its own advantages*

INNOVATION AND KNOWLEDGE: AN ALTERNATIVE PERSPECTIVE

- Communities of practice: vehicle for distanced learning (Amin & Cohendet 2004)
 - Questions assumption that *spatial* proximity implies *relational* proximity, or that the latter requires the former
 - Relational proximity *is what really matters*
 - i.e. if other social affinities are sufficiently strong, these can compensate for absence of spatial proximity, and enable long-distance learning
 - Shared project, expertise, experience facilitate learning
 - joint production and sharing of knowledge within distanced teams
 - Allows organizations to tap into *distributed competences* (not always feasible to bring parties together in same place)

RECONCILING TWO APPROACHES: A MORE NUANCED ANALYSIS

- Alternative view compelling
- But danger of overstating case?
 - Are CoPs *always* effective substitutes for being there? Limits?
- *Under what circumstances* is distanced learning likely to be
 - Facilitated, effective?
 - More difficult to achieve?

KNOWLEDGE FLOWS: WHAT AFFINITIES FACILITATE LEARNING?

- Individual
 - Language
 - Education
 - Experience
 - Occupation (= education+experience)
- Organizational
 - Corporate culture
 - Firm-specific, characteristic practices, routines

KNOWLEDGE FLOWS: WHAT AFFINITIES FACILITATE LEARNING?

- Industrial
 - Knowledge base varies by sector (Pavitt 1984, Malerba 2005)
- Institutional
 - National (Varieties of capitalism, NIS, NBS)
 - Regional/local (learning region)
 - Shared norms, attitudes, values, expectations, conventions *facilitate understanding*
- Geographical
 - F2F, being there

DISTANCIATED SOCIAL LEARNING: THE IMPACT OF KNOWLEDGE TYPE

- Some types of knowledge ‘travel’ more easily than others
 - Tacit–codified spectrum (too simple)
 - Knowledge base
 - Analytical – synthetic – symbolic
 - (Laestadius 1998; Asheim & Gertler 2005; Asheim, Coenen & Vang 2006)
 - Mix of knowledge bases varies by sector (and over time)

KNOWLEDGE BASES: A TYPOLOGY

Analytical	Synthetic	Symbolic
Know why ; developing new knowledge about natural systems by applying scientific laws	Know how ; applying or combining existing knowledge	Creating meaning, aesthetic qualities; affect; know who critical
Scientific knowledge, models, deductive	Problem-solving, inductive, custom production	Creative process
Collaboration within and between research units	Interactive learning with customers, suppliers	Learning-by-doing, in studio; project teams
Strong codified knowledge content; highly abstract, universal	Partially codified knowledge, strong tacitness more context-specific	Strong semiotic knowledge content; some forms highly context-specific
Meaning relatively constant by location	Meaning varies substantially by location	Meaning highly variable by location
Drug development	Mechanical engineering	Advertising

DISTANCIATED LEARNING: MORE DIFFICULT WHEN PARTIES ...

- Speak different languages
- Come from different educational, experiential, occupational backgrounds
- Work for organizations with different prevailing practices, cultures, routines
- Come from different
 - national business systems
 - varieties of capitalism
 - national/regional innovation systems
- Work with synthetic, symbolic knowledge

IMPLICATIONS FOR CASE STUDIES:

QUESTION ONE

- What kinds of knowledge flows predominate?
 - Within specialized concentrations of economic activity?
 - Between local sectors, where variety fosters spillovers?
 - Between local sectors: diverse but related?
- To what extent are investment decisions of firms motivated by the 'mix' of economic activities locally?
- How is knowledge circulated between firms?
 - Embodied flows (labour mobility between firms/sectors)
 - Disembodied forms (observation, formal/informal networks, patents, publications)
 - Role of research organizations/knowledge infrastructure in fostering local knowledge circulation

IMPLICATIONS FOR CASE STUDIES:

QUESTION TWO

- What kinds of knowledge bases predominate?
- Where are actual or potential non-local partners, and what kinds of affinities exist?
- To what extent have local firms or other local actors (entrepreneurs, workers, research organizations) invested in 'pipeline-building'?
- To what extent do local firms have organizationally defined proximities to non-local partners?