7 Spatial Clusters of ICT Industries

Börje Johansson

Jönköping International Business School, Jönköping University

7.1 Introduction

7.1.1 Models of Cluster Economies

One basic observation is that economic activities are clustered in space. This may be seen as a prerequisite for the existence of agglomerations. In McCann (2001) industrial clustering is described as place-specific increasing returns to scale, due to positive externalities that co-located activities generate. As such, it is closely related to the phenomenon known as agglomeration economies with roots in Marshall (1920) and promoted by Krugman (1991). A closely related but distinctly different approach is due to Hoover (1948). In both cases, agglomeration effects accrue inside an urban region sometimes referred to as an industrial district.

In Marshall’s theoretical scheme, there are three sources of agglomeration economies, namely (i) non-traded local inputs, (ii) local skilled-labour supply, and (iii) information spillovers. In the subsequent analysis, the first category is relabelled to read distance-sensitive inputs. Because of high geographic transaction costs, these inputs are more expensive when delivered from sources outside the region. Hence, proximity becomes an advantage when supplier and customer firms are co-located. The second category is related to a firm’s labour acquisition costs. In a region where a large share of the labour force already has specialized skills, the costs of the firm to expand its labour force may be lower than otherwise. For example, search and retraining costs can be assumed to be lower when the labour pool is large.

According to the above arguments, proximity to specialized input suppliers and specialized labour supply will imply that inputs can be acquired at lower total prices for given quality levels. Because of this, the described phenomena are called pecuniary externalities. On the other hand, information spillovers have a non-pecuniary character. In some sense, the agglomeration information is locally available as a public good, and brings benefits that are not charged any price, except (possibly) in the form of land prices.

The spillover phenomenon refers to inter-firm externalities that can generate incremental as well as more radical innovations with regard to firm routines and
product attributes. In this context there are two competing hypotheses. The first, which is attributed to Marshall, emphasizes localization economies, and the second, attributed to Jacobs (1969, 1984), stresses urbanization economies. With localization economies spillover is fostered by similarity among firms in a cluster, whereas urbanization economies imply that spillover is a diversity phenomenon. With pecuniary externalities it is equally relevant to distinguish between localization and urbanization economies (McCann 2001).

A recent article by Gordon and McCann (2000) provides a comprehensive assessment of various theoretical frameworks in which economic clusters have been discussed and researched. They find a tendency to use terms such as agglomeration, clusters, industrial districts, economic milieu, and industrial complex more or less interchangeably, and with little concern of how to operationalize the ideas. They suggest that the literature contains three basic notions of clustering: (i) the classic model of pure agglomeration, (ii) the industrial-complex model, and (iii) the network or club model focusing on social ties and trust. In this study, the two first notions are considered. In the pure agglomeration model, externalities arise via the local market and local spillovers. The industrial-complex model stresses the role of trading links that help to reduce transaction costs and ascertain input quality. The two notions merge in the sense that local markets and local transaction links can exist side by side in a functional region.

In concordance with the suggestions in Chap. 8, proximity to input suppliers and to customers are here introduced as important aspects of agglomeration economies. Proximity in these two respects can be substituted by supplier-customer links which are formed in order to reduce transaction costs and hence to eliminate the influence of distance on the interaction between seller and buyer. Such links can develop into networks that have similar properties as clusters although the networks extend across regional boundaries. Proximity does not exclude that local networks are formed. However, proximity implies that it is easier to establish links for transactions and cooperation, and hence, it is also easier to rearrange such links more frequently. In the subsequent analysis, it is important to recall this distinction between networks and clusters. This is emphasized by using the term spatial clusters.

Cluster formation can be described as a location process. At each point in time, we may look for a static picture of co-located (localized) industries and co-located firms. One may interpret such location patterns as an equilibrium outcome. However, it may also be conceived as a momentary picture of a dynamic location process, where an attractor drives the dynamics, and this attractor may have equilibrium properties. Although the statistical sources in this chapter can be used to examine change processes, the empirical analysis is a static cross-section exercise that represents a first step of a more comprehensive study.

7.1.2 The ICT Sector and Spatial Structure

In this chapter, ICT is used as an acronym for information and communication technology. During the 1990s, ICT was considered as a specific growth factor in