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ICT clusters in Europe The great central banana and the small Nordic potato

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Abstract

We analyse the clustering of European ICT activities. Our focus is primarily on the ICT manufacturing industries in the EU countries. We find a clear and intensifying concentration tendency of ICT-related production and R&D. As a rule, originally specialized countries have become more so. In terms of export specialization, however, countries have become more similar. This may be a consequence of new production modes and distribution systems in the sector. Mapping of ICT businesses by postal code reveals two blocs of European ICT activity. The larger central bloc begins in the greater London area and proceeds via Randstad through Germany's industrial heartland and ends in northern Italy. The smaller Scandinavian bloc covers the Helsinki and Stockholm metropolitan areas. Our empirical investigation shows a notable country-level specialization in ICT, but businesses within the EU are concentrated into spatial clusters that do not respect national borders. © 2002 Elsevier Science B.V. All rights reserved.

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1. Introduction

Information and communication technology (ICT) is arguably the most powerful agent for change in advanced societies. The demand-side, i.e. the use of ICT, is

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perhaps the more important one in considering productivity and other macro-economic effects. A particularly interesting question is the contribution of ICT use to economic growth (see, for example, Jalava and Pohjola, 2002). The supply-side, i.e. the production and provision of ICT-related goods and services has, however, grown to a sizeable business in its own right not only in the United States but also in Europe and elsewhere.

Both the production and use of ICT are unevenly distributed across countries and regions (Quah, 2001). While this is typical of emerging and fast evolving technologies, there are particularly significant spatial differences in the patterns of ICT production. Traditional explanations for these differences include distinct factor endowments, technologies, and policies.

Regions with originally similar or identical characteristics may develop in very different directions. Hence, the locational patterns of ICT cannot be explained in terms of factor endowments and policy regimes only. The views of new economic geography and micro-(firm-)oriented industrial economics are needed.

The tendency of particularly knowledge-driven industries to cluster geographically as well as the implications of the new growth theories have also been recognized in policy making. Countries and regions are moving their policies towards ‘creating favourable framework conditions’ (see, for example, OECD, 1999a). The rationale of these policies is to enhance the creation of pools of advanced factors of production that attract knowledge-intensive firms and hence lead to fast growing industrial clusters.

In this paper we look at the clustering of the ICT sector in the European Union (EU). Due to data limitations, our focus is primarily in the country-level production of ICT manufactures. We address the following issues.

- Location of European ICT sector activities.
- Relative specialization of European economies in production, technology, and trade.
- Changes in ICT-orientation over time.
- Explanations of changing patterns of ICT specialization.

2. *Specialization of countries and regions*

Economic literature suggests that industrial countries have become increasingly specialized in their patterns of production (see, for example, Hummels et al., 1998). But why do countries and regions specialize in certain types of production? Traditional trade theory explanation relies on differing comparative advantages. This explanation has, however, proved insufficient in explaining patterns of specialization.

The more recent literature of economic geography discusses various *centripetal* and *centrifugal* forces, i.e. forces fostering spatial agglomeration and dispersion,

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