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The impact of the information and communications technology revolution on the internationalisation of corporate technology

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Abstract

The rising pace of technological change in information and communications technology (ICT) has doubtless provoked the rise of "techno-globalism" at a cross-firm level by providing a new mode of diversification. As a result of the increasing process of technological interrelatedness, the specialisation in a core pervasive technology (as ICT is nowadays) allows the firm to develop tacit capabilities, which, in turn, facilitate its corporate activity in different kinds of technology across national boundaries in an intra-firm network. Therefore ICT can be view as a platform for entry into new products as well as an enabler of fusion of technology.

This paper investigates whether the increased specialisation in ICT has influenced the geographical diversification or internationalisation of firms. The association between the two phenomena is found in the later (but not in the former) period under analysis. By adopting a more detailed level of sectoral aggregation within the ICT field, the econometric analysis seems to indicate computing (rather than communications) as the ICT component driving the relationship between internationalisation of research and development activity and ICT specialisation. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

The 1970s' techno-socio-economic paradigm shift has been characterised by the emergence of technological opportunities in microelectronics technology and computerised systems, which other technologies and related innovations depend on. Since each paradigm shift involves technological and institutional as well as organisational structural changes, in the 1970s the widespread application of information and communications technology (ICT) promoted the rise of Japan as technological leader, and the success of flexible manufacturing systems and corporate network linkages as new forms of organisation of production (Lazonick, 1992).

Similarly, the 1970s witnessed the phenomenon of technological globalisation. Globalisation is a concept broader than internationalisation since it goes beyond the simple "going abroad" of the multinational corporation (MNC) by implying the establishment and development of international, integrated intra- and inter-firm technological networks and, accordingly, the co-ordination of geographically dispersed research and development (R&D) activities. Therefore, globalisation of technology can be understood as a process involving "new modes of interactions across borders (such as foreign direct investment (FDI), inter-firm corporate agreements) as well as the active intervention of new economic agents, such as multinational corporations" (Svetličič, 1996). Despite these differences, the terms globalisation and internationalisation will be used here synonymously with reference to the definition provided above. Great attention has been paid to this phenomenon as a consequence of the increasing share of technological activity located abroad by leading multinationals. The dimensions of this process have been evaluated in a rather controversial way. The argument of an effective impact of such a process in economic life (Cantwell 1995, 1998; Dunning, 1993; Howells & Wood, 1993; Humbert, 1995) faces the sceptical view about the dimensions of globalisation in empirical terms (Patel, 1995; Patel & Pavitt, 1991). It should, however, be pointed out that the sceptics seem to criticise mainly the idea of a stateless corporation. Indeed, few firms have lost the central role played by their home base, although they now interact with other geographically dispersed centres.

The authors arguing for an effective international increase in the generation, transmission and diffusion of technology explain this phenomenon as due to the technological opportunities the current paradigm has opened up (Archibugi & Michie, 1995). The rising pace of technological change in ICT has doubtless provoked the rise of "techno-globalism" (Archibugi & Michie, 1995) at a cross-firm level as a result of the increasing process of technological interrelatedness. Besides the flexibility in promoting the development of just-in-time distribution skills and consequent geographical dispersion (Bordeau, Lock, Robly, & Straud, 1998), ICT specialisation (in general) and computerisation (in particular) also play two major roles. First, it can be argued that the shift into ICT has played a great role in strengthening the globalisation of economic activity as a result of an enlargement of the corporate spectrum of active technological fields across national boundaries through an intra-firm network. Therefore, specialisation in these cutting-edge fields provides the firm with a platform for entry into new products. Second, due to the pervasive character

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