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Corporate strategic technological partnerships in the European information and communications technology industry

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Abstract

In the era of ''alliance capitalism'', the increasing number of strategic technological partnerships (STPs) has been mainly recorded in the science-based fields, of which information and communications technology (ICT) is a leading sector. The establishment of STPs has also characterised the European ICT industry. The growing technological interrelatedness and the need to acquire capabilities in related fields have been identified in the literature as major explanations for the increase in corporate technological co-operation. This paper investigates the role of corporate technological specialisation factors in the conclusion of STPs in the European ICT industry by carrying out a dynamic analysis. Accordingly, the patterns followed by corporate technological partnerships in the industry in question are investigated since the late 1970s. Based on US patent data granted to the world's largest firms as well as STPs data, the results of the econometric analysis are consistent with the view that the more similar partners' technological portfolios are with one another, the easier it is to absorb each other's capabilities.

Keywords: Strategic technological partnerships; European ICT industry; Absorptive capacity; Co-ordinated learning vs. exchange of knowledge

1. Introduction

In the 1980s, the increased adoption of strategic technological partnerships (STPs) as a form of organisation of economic activity has been identified as a main feature of a new phase of the capitalist system (Gerlach, 1992; Dunning, 1995, 1997), where competitiveness is increasingly pursuid through co-operation. The growth in the number of technology-based inter-firm alliances has mainly been recorded in science-based fields (such as information and communications technology, ICT) (Hagedoorn, 1993b; Hagedoorn and Schakenraad, 1992; Duysters and Hagedoorn, 1995). This trend may be interpreted as a new corporate strategic response to increasing technological interrelatedness and complexity in order to co-ordinate change and innovation effectively.

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Based upon a resource pooling strategy, corporate alliances promote synergies between allied companies, thus affecting the development of firms' internal capabilities and furthermore their technological profiles over time. Since inter-firm alliances tend to develop in areas in which firms shares complementary capabilities, partner's choice can be predicted by firms' technological overlap (Mowery et al., 1998). Nonetheless, a distinction should be made between complementary and close complementary firm-specific paths of development (Cantwell and Barrera, 1998). The fruitful exchange of knowledge requires the complemenarity of activities, but cooperative learning creates a closer complementarity between those activities. Technological collaborative agreements are likely to promote partners' technological convergence by encouraging coordination between partners' internal paths of innovative learning. By contrast, in the former, firms' learning paths become more localised, although their activities remain complementary (ibid.). However, if alliances enable firms to cope with the fast rate of technological development, they cannot substitute in-house investment in order to enhance firm's technological competencies. Multinational corporations (MNCs) still need to diversify in the range of technologies they master since a wider range of specialised knowledge is now required for the production and distribution of specific products (Granstrand and Sjölander, 1990; Granstrand et al., 1997). The growth in STPs has also characterised the European ICT industry, where a cooperative strategic approach has been adopted to deal with the issue of European competitiveness in electronics. For this purpose, European electronic corporations have increasingly targeted technological collaboration as a major strategy in their agenda.

Using data on patents granted in the US to the world's largest firms as well as data on STPs, this paper aims to evaluate the role of corporate technological specialisation factors in the completion of STPs in the European ICT industry. The novelty of the paper lies in the fact that few studies have addressed the issue of corporate technological specialisation dynamics in the conclusion of STPs. Moreover, as the paper deals with this issue in the context of a high-tech industry, the results of the analysis appear to have relevant implications for both corporate strategy and public policy agenda.

Strategic technological agreements are understood as inter-firm long-term cooperative relationships concerning one or more areas of activity, where combined innovative activity or an interchange of technology is at least part of the agreement and the contractual mechanisms can be more or less formally specified. The ''strategic'' character is given by the fact that the agreement improves the future value of the firm rather than simply minimising the net costs. As discussed above, firms are willing to enter alliances in order to acquire partner's capabilities related to their fields of competencies. Therefore, firms with overlapping portfolios of technological specialisation are likely to become partners. Combining the patent data drawn from the Reading patents database with the Advanced Research Programme on Agreements (ARPA) database — see Appendix A — two hypotheses are tested over the period 1978–1995 in the context of the European ICT industry.

Hypothesis 1: the degree of overlap between partners' technological specialisation profiles has a positive influence upon the formation of STPs. The closer companies' co-specialisation, [1] the greater the likelihood of alliances between them for the purpose of technological cooperation; but, if firms are not co-specialised, the greater is the degree of technological dissimilarities between them, the less likely the formation of an alliance.

Hypothesis 2: partners' technological specialisation over time is likely to further converge in the case of alliances between firms that were co-specialised in the previous period, while already dissimilar partners are likely to further diverge if they have concluded alliances previously. Further technological convergence/divergence may be linked as well to the extent of technological diversification of firms over time.

The organisation of the paper is as follows. The role of STPs in the ICT-based paradigm is discussed in Section 2. Section 3 sheds some light on the data

[1] The term co-specialisation refers to the co-presence of partners' technological expertise in the same sectors.