CHAPTER V. Internationalisation of R&D in ICT

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1 Introduction

An important aspect of the ongoing integration of the world economy is the internationalisation of research and development. Enterprises not only produce and sell, but also increasingly develop goods and services outside of their home countries. The internationalisation of R&D is not a new phenomenon, but has gained momentum in recent years (Veugelers 2005, Part 1). A considerable part of this acceleration can be attributed to the activities of multinational enterprises (MNEs). MNEs increasingly locate R&D and innovation activities outside of their home country (Narula and Zanfei 2005; Veugelers 2005).

This chapter takes a closer look at the magnitude and at the patterns of these developments using patent data. Since R&D is a knowledge intensive activity, the internationalisation of R&D in ICT is most relevant for the two knowledge intensive sectors of the four-sector typology discussed in chapter II. These sectors are innovative scale and innovative niche product sectors. We will therefore focus on ICT industries in these two areas. R&D internationalisation in these two sectors may be more technology-driven, leading to dispersed R&D activities around the world and R&D units located where high-quality scientific input may be expected.

R&D internationalisation may also occur in the two other less knowledge-intensive sectors. However, since scale and other factors than knowledge may be more relevant for economic success, R&D internationalisation is less relevant than in the knowledge-intensive sectors. Foreign R&D facilities will mainly support production and marketing activities by adopting existing technologies to foreign markets.

Section 2 of the chapter will examine the relevant literature in relation to the internationalisation of research and development. In addition to that, it will discuss the main arguments brought forward to exemplify the process. Furthermore, in section 3 we will examine how research and development activities in the field of ICT have spread over countries in recent years with patent data. The final section of this chapter summarizes the main findings of the analysis and gives some conclusions.

2 R&D Internationalisation Strategies of Enterprises

The theoretical analysis of the question why firms locate R&D and other innovative activities abroad received important contributions from a number of different research streams within the economic literature, including the international busi-
The literature (see the reviews of Narula and Zanfei 2005 and Veugelers 2005) discusses two basic strategies of how multinational enterprises organize cross-border innovation activities. A very interesting distinction of these two basic motives to decentralize research and development has been brought forward by Kuemmerle (1999) who distinguishes between ‘Home-Base Exploiting’ (HBE) and ‘Home-Base Augmenting’ (HBA) strategies.

2.1 Home Base Exploiting Strategies

‘Home Base Exploiting’ (Kuemmerle 1999) or ‘Asset Exploiting’ (Dunning and Narula 1995) describes a strategy where foreign-owned affiliates are mostly exploiting existing knowledge to support foreign production by doing minor development work in adjusting existing technologies and products. Knowledge relevant for the innovative activity at the affiliate mainly originates from within the multinational group. External linkages to firms, universities or public laboratories in the host country are only of minor importance for the innovative outcome of the affiliate. The most important information sources that contribute to innovative performance of the affiliate reside inside the MNE.

‘Home Base Exploiting’ – approaches to explain the internationalisation of R&D are rooted in the framework of the theory of the multinational enterprise and the international business literature (Dunning 1973; Markusen 1995; Barba Navaretti and Venables 2004). Multinational enterprises exist because they possess firm-specific assets like technological knowledge, well-known products and brands, design or management capabilities, etc. These assets are intangible, fully appropriable and transferable within the firm. MNEs use these assets to enter foreign markets because they give them advantages over incumbent competitors. To fully exploit these assets, they have to be adopted to local needs, consumer tastes, regulation etc. Engineering and design activities are located in the MNEs’ target markets to do these adjustments close to the customers and production facilities abroad.

The explanation brought forward by the international business literature can explain a lot of the characteristics of the current internationalisation of corporate R&D. If foreign R&D mainly supports local production of MNEs, it seems clear that innovative activities are less internationalized than production or sales activities. The incentive for MNEs to support local production with R&D and design units increases with the size a foreign market and the production volume of the MNE in this market. Companies have no need for R&D abroad below a certain market size.

HBE argues that internationalisation of R&D has to be seen in the broader context of international trade, foreign direct investment and other aspects of internationalisation. R&D and innovative activity acts as an auxiliary function of overseas production and sales activities.