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Multinationals, Clusters and Innovation

Does Public Policy Matter?

Edited by

Ana Teresa Tavares and Aurora Teixeira

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and

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To Frederick
To João, little João and Sara

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Preface

This is a remarkable book for several reasons. In the first place is the range of contributions – from all parts of Europe, from Asia and from Latin America. In a book that deals with globalization and foreign direct investment (FDI), this is of course what the reader would hope for but it is actually still quite rare to find such a widespread coverage.

Secondly, although the geographic and political range of the contributions is very wide, the editors and the contributors have avoided the temptation to make the book simply a quantitative study of scale and trends in foreign direct investment in various parts of the world. They have concentrated instead on qualitative analysis of the nature of this FDI and its relationship with host countries. This again is what most readers would hope to find as there are other sources for the global statistics.

Thirdly, a very valuable feature of the book is its attention to the relationships between the inward investment and host-country institutions, especially of course the already established firms and industries. It is frequently assumed that FDI is simply a one-way flow of new capital, new equipment, skills and new technology to the benefit of the importing host country. Many chapters show that this is by no means always the case. There is a two-way relationship in which the incoming firm also benefits from the knowledge and techniques already available in the host country.

This means that analysis of the networks developed around the incoming firms in the host countries is by no means a simple business and the study of their innovations in particular is not a simple matter. For this reason a particularly welcome feature of the book lies in the fact that most of the authors participate both in business studies research and teaching and in the more specialized innovation studies characteristic of evolutionary economics and technology policy research organizations. The confluence of these two streams of research lends much greater realism to their work.

Finally, it is obvious that this is a very rapidly changing feature of the world economy and that any studies can soon become out of date. Almost all of these chapters deal with the twenty-first-century developments although they often also have a longer historical perspective. For this reason it is to be hoped that this book is soon circulating widely in business schools, in universities, in business and government, as we all have much to learn from it.

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1
Introduction

Aurora Teixeira and Ana Teresa Tavares

There is hardly any doubt that multinational enterprises (MNEs), clusters, and innovation are three major engines of growth and development. Moreover, they are often related, though in various ways, and with different degrees of strength.

Multinational firms are sought after (literally chased) by nearly all countries nowadays. The forces of globalization, the growing unemployment pressure in many regions in the world (especially in developed countries) and the need for fast technological renewal stimulate this authentic 'race' (Oxelheim and Ghauri, 2003) for foreign direct investment (FDI). This state of affairs is also made possible given the lack of a minimum multilateral regulatory framework as regards MNE- and FDI-related policies (Young and Tavares, 2004).

One of the key issues in order to thrive in this demanding and often hostile environment, as well as to take into account the fact that most FDI is sequential, is that attention should shift from merely attracting FDI (the 'quantity' aspect) to enhancing the quality of such inward investment. Both the quantity and the quality dimensions are analysed in this volume. Nonetheless, as most of the literature until quite recently emphasized FDI attraction, neglecting to a considerable extent qualitative issues, a deep look into the factors that make an investment distinctive as regards its quality is a central objective of this book.

Hence, topics such as innovation, linkages and industrial agglomeration are highlighted. These three aspects are undoubtedly extremely important from both a host economy and from a MNE subsidiary viewpoint (and also potentially from the host economy and the headquarters perspective), as innovative firms, developing strong linkages with the local industrial fabric, and benefiting from being situated in vibrant and resourceful clusters are likely to have greater survival probability, and an enhanced position in the group. It is also much more promising from a host economy standpoint, given the potential for spillovers that innovation, linkages and agglomeration enhance (Tavares and Young, 2005).

The literature on subsidiary strategies and evolution (White and Poynter, 1984; Birkinshaw, 2000), and on the MNE as a differentiated network (Hedlund, 1986; Forsgren and Johanson, 1992), highlights exactly the different impact of MNEs' activities according to their role and evolutionary path in the host economy and intra-group (Pearce, 2001). This view is adopted in several of the chapters here.

This volume is divided into five parts (see Table 1.1 for a summary). The first one deals primarily with *Multinationals* and *Innovation*, analysing themes such as the relevance and magnitude of knowledge spillovers between MNEs and domestic firms, and host-country environment and MNEs. Emphasizing the latter, less focused, direction Dachs and Ebersberger examine how MNEs draw on knowledge from their host economies, i.e. the spillovers from host country to affiliate. Using data from the most recent Community Innovation Survey (CIS) relative to Austria, where MNEs maintain a strong presence in science and technology, the authors scrutinize the differences between Foreign Owned (FO) and Domestic Owned (DO) companies as regards their propensity to enter into co-operative arrangements, and their evaluation of various information sources.

The importance of knowledge spillovers is also noted in Chapter 3. Damijan, Jaklič and Rojec investigate internal and external sources of innovation and evaluate their impact on the productivity growth of a large sample of Slovenian firms (in the period 1996–2002). The authors test whether, and to what extent, firms' ability to innovate is induced by their own R&D activity, and by factors external to the firm, and what are the most important channels of external knowledge spillovers that contribute to productivity growth.

In Chapter 4, focusing on a rather under-explored source of FDI spillovers (product innovation) and on an under-researched type of companies (state-owned enterprises – SOEs), Girma, Gong and Görg assess the potential role foreign MNEs can have in the process of enhancing innovative performance. At the forefront of this chapter, the authors provide an overview of the outstanding recent performance of China in terms of inward investment attraction, and of the success of the proactive (economic liberalization) policies Chinese policy-makers adopted in order to attract FDI. Subsequently, and employing alternative econometric strategies to a sample of 30 000 Chinese SOEs for the period 1999 to 2002, Girma et al. assess whether R&D intensity influences the rate and incidence of new product innovation. While this chapter carries the optimistic message that FDI acts as a channel of product innovation externalities to Chinese SOEs, it also underscores the importance of getting the firm-level fundamentals right.

Iammarino, Sanna-Randaccio and Savona (Ch. 5) provide fresh insights on the locational and innovative choices of foreign MNEs relative to those of nationally-owned firms, and the integration between MNE innovative activities and territorial systems in a country – Italy – with a relatively weak

Table 1.1 Overview of the book's main issues

Chapters/authors	**Countries**	**Industries**	**Number of firms**	**Period of study**	**Main issues**
Chapter 2 – Dachs and Ebersberger	Austria	All	1287	1998–2000	
Chapter 3 – Damijan, Jaklič and Rojec	Slovenia	All		1996–2002	
Chapter 4 – Girma, Gong and Görg	China	All (State owned firms)	30 000	8313	Multinationals and innovation
Chapter 5 – Iammarino, Sanna-Randaccio and Savona	Italy	All	15 512	1998–2000	
Chapter 6 – Ferreira, Tavares and Hesterly	Portugal	Molds	Cluster*	1940–2004	
Chapter 7 – Gleeson, Ruane and Sutherland	Ireland	Manufacturing	Census data of all plants with ≥3 employees	1985–2001	Clusters and industrial development
Chapter 8 – Peters and Young	Ireland, Scotland	Biotechnology and life-sciences	2	1969–2004; 1997–2004	
Chapter 9 – Pedersen	Austria, Denmark, Finland, Germany, Norway, Sweden, UK	All	2107	2000	Linkages between multinationals and local firms
Chapter 10 – Andersson and Persson	Europe, North America	Manufacturing	97	2000s	
Chapter 11 – Giroud	Malaysia	Electrical and electronics	120	1996; 2001	
Chapter 12 – Figueiredo	Brazil	Electrical and electronics; motorcycle and bicycle	46	1999–2002	Innovation and linkages
Chapter 13 – Costa, Videira and Veloso	Portugal	Automotive	1	1999–2004	
Chapter 14 – Varum	Portugal, Spain	Automotive	4	1990s	
Chapter 15 – Männik and von Tunzelmann	Estonia, Hungary, Poland, Slovakia, Slovenia (CEEs)	All	433	1998–2002	
Chapter 16 – Bellak and Leibrecht		–	235 observations**	1996–2002	Policy issues
Chapter 17 – Pearce and Papanastassiou	–	–	–	–	

Note: * Currently comprises about 200 firms employing 5000 workers.
** Panel data involving 7 home-countries (i.e., Austria, Germany, France, Italy, The Netherlands, United Kingdom and the United States of America) and the CEEC-5 (i.e., Czech Republic, Hungary, Poland, Slovak Republic and Slovenia), from 1996 to 2002.

degree of both active multinationality and attractiveness towards foreign firms. Based on a similar data source (CIS) as Dachs and Ebersberger (Chapter 2), Iammarino et al. try to assess whether the perception of the importance of obstacles to innovation vary among type of firms and regions and whether such obstacles influence firms' locational choices and the potential level of innovative activity. Additionally, the locational patterns of foreign MNEs' innovative activities in Italy is researched and related to their obstacles' perception. Controlling for a series of regressors, among which firm size, sectoral specificities, ownership type, geographical location, and innovativeness, in a sample of 15 512 firms, Iammarino et al. reveal that the evaluation of obstacles is a relevant symptom of a higher awareness of innovative firms of the problems encountered when carrying out innovation activities.

The second part of the book is devoted to the issue of *Clusters* and *Industrial Development*. It encompasses a broad and relevant range of topics both conceptually focused (Chapter 6) and empirically driven (Chapters 7 and 8). Building on the idea that only by observing the genesis of the ties between firms one is better able to understand the formation and evolution of the inter-firm organizational forms that preside in clusters, thus enabling to understand how clusters develop, in Chapter 6 Ferreira, Tavares and Hesterly provide a rich conceptual account of the evolution of industry clusters through spin-offs highlighting the role of flagship firms. The authors posit that some clusters may emerge and develop more endogenously than usually considered in the literature, through the gestation of new firms. By focusing on entrepreneurial issues at the genesis of at least some clusters, Ferreira et al. contribute primarily to research on the evolution of clusters as a function of entrepreneurial activity by entrepreneurs that are insiders to the cluster, and also to the literature on the value of networks to support entrepreneurial dynamism and success. Moreover, they also formulate some insights on the possible role of 'flagship' firms, specifically MNEs in originating clusters, further complementing extant clusters' research. This chapter presents a 'motherhood model' offering a rather positive perspective of firms' spin-offs focused essentially on employees exiting because there is a promising entrepreneurial opportunity, often complementary to the parent's activity. Although ample empirical evidence in different countries and industries exists testifying that this motherhood process is a realistic model explaining the emergence and development of several clusters, in order to illustrate such perspective the authors examined the particular case of the plastic molds cluster of Marinha Grande, Portugal – an international leader in various niches of the industry.

Although the case of Ireland has been producing a considerable amount of studies related to FDI, proactive policies to promote spatial and sectoral clustering, the success of such policies is little analysed or understood. Moreover, the association of spatial and sectoral MNE clustering and the concentration of local (Irish-owned) enterprises have not yet been measured. In Chapter 7, Gleeson, Ruane and Sutherland compare the spatial and sectoral concentration of manufacturing enterprises in the Irish economy in 1985 and 2001 in order to establish the impact of industrial and regional policy objectives on the clustering of enterprises during this period. Using entropy indices, the pattern of spatial changes found suggests that market forces were already driving firms out of more concentrated locations prior to the introduction of policies to promote greater spatial dispersion in the late 1990s. MNEs have become more sectorally specialized over the period, which is not surprising as policy is deliberately selective in attracting MNEs to key high tech manufacturing sectors.

In Chapter 8 Peters and Young debate whether it is advisable or feasible for peripheral areas – namely, Ireland and Scotland – to target the biotechnology sector, where financial demands and risks (but also potential returns) are high. The example of Ireland highlights the challenges for public policy in taking a position on the structure of the biotech sector, and seeking to nurture a flagship firm. The authors emphasize that there are advantages related to this approach that can be integrated closely with a cluster model of development, but the risks of picking winners are high. In Scotland, while the number of players suggests a buoyant, innovative industry, most are small start-ups. The Scottish approach is termed a 'nursery-model', where an environment of early-stage development revolving around university science is encouraged. The high costs and risks of progressing along the value chain suggest high failure rates for such firms and a high propensity for mergers and acquisitions. The evidence from this chapter is that it is indeed advisable for peripheral areas to target the biotech sector, especially where the basic preconditions exist, notably, a strong science-base; but the critical issue is still the feasibility of this strategy. In particular, and according to the authors, policy-makers have not resolved the fundamental challenge of how to promote the successful emergence and development of significant international businesses of scale, i.e. in filling the gaps in the local milieu.

Local milieu development is intimately related to *linkages* among firms, specifically between *Multinationals* and *Local Firms*. This topic is detailed in Part III of the book. Evidence is gathered (Pedersen, Chapter 9), based on a large-sample data set of more than 2100 subsidiaries located in seven different European countries, and shows that in fact local dynamism in the business environment is an important source for the upgrading of subsidiary competences. This chapter undertakes the first statistical large scale test of Birkinshaw and Hood's (1998) seminal paper on subsidiary evolution, which proposed a model suggesting that such evolution is determined by headquarter assignment, dynamism of local business environment and subsidiary initiatives. The effect of these three determining factors on subsidiary development is tested simultaneously.

Following the same line of the previous chapter, in Chapter 10 Andersson and Persson argue that knowledge-creating activities in subsidiaries are linked to their local environment. They stress, however, that the environment provides opportunities for knowledge acquisition and creation, but it does not induce knowledge development per se. These authors examine how linkages (relationships) between the subsidiary and the local environment influence MNE *re*-investments in host-country subsidiaries. Such investigation is likely to contribute to our current understanding of MNE investment behavior: despite evidence showing that re-investments are a major source of resource inflows into nations, research examining MNE re-investments is relatively sparse. Based on a cross-industry, cross-country data set, from 20 business areas for 97 subsidiaries (92 located in Europe, five in North America), face-to-face interviews with managers at both HQ and subsidiary levels, and 514 relationships to customers and suppliers viewed as important, Andersson and Persson show indeed that the local environment represents an important source of knowledge for the subsidiary and, more specifically, that close relationships with network partners may enhance the importance of the subsidiary within the MNE.

Another type of (however complementary) linkages – supply relationships and supply networks – is featured by Giroud (Chapter 11). The central debate in this chapter is about the background and specificities of multinationals' supply relations in the Malaysian electrical and electronics industry, assessing the success of government policies implemented to encourage supply linkages by MNEs. Complementing other FDI policies Giroud suggests that the latest Malaysian Master Plan emphasized the need for inter-firm linkages and cluster development. Following this policy stance soft incentives have been launched to try and encourage MNE-local supplier linkages. More specifically, the Malaysian government tried to foster linkages through its Industrial Linkages Program (ILP), encouraging (through tax incentives) large companies to undertake actions to enhance the quality of local vendors. Small local vendors also receive incentives when they take part in the program. Based on data gathered through a direct survey of 95 foreign affiliates in 1996 and 25 of these firms in 2001–02, Giroud evaluates the dynamics of local purchasing in this period.

Further research on *Innovations* and *Linkages* is presented in Part IV, including some appealing case studies: local firms and MNEs' subsidiaries located in a developing area of a large late-industrializing country, Brazil (Chapter 12); a large 'cluster-generating' MNE subsidiary from the automobile sector located in Portugal (Chapter 13); and buyer–supplier linkages in the automotive sector in Portugal and Spain (Chapter 14).

In Chapter 12, Figueiredo examines the extent to which globalization of innovative technological capabilities has been spreading to a developing area – the Industrial Pole of Manaus (Northern Brazil) – by investigating the extent to which firms' capabilities have progressed from basic operations levels into innovative levels, not only within electro-electronics firms, but also in two-wheel vehicles' firms and key suppliers. Additionally, he assesses the association between technological capabilities and export performance. Figueiredo argues against over-generalizations and assumptions related to the non-globalization of innovative capabilities, the general deterioration of industrial technological capabilities, and low competitiveness as a result of a change into an outward-looking pattern of industrial development.

It is hardly debatable that MNEs can be credited with positive contributions to economic development if they are able to build a robust level of backward linkages. Aiming at a more profound understanding of how domestic value creation by foreign MNEs increases the potential for creating wealth in the region, Costa, Videira and Veloso (Chapter 13) propose an innovative 'combined model', which extends traditional input–output (I–O) value estimations by coupling it with a detailed account of the structure of existing and potential domestic purchases and an engineering-based cost estimation method, called System Cost Modeling (SCM). Using Autoeuropa (AE) (Ford–VW project) as case study, Costa et al. analyse what the impact of this project would have been under different circumstances and explore alternative value generation configurations. The application of the SCM/I–O combined method to the AE investment shows that variations in the level of incorporation of domestic supplies mean dramatic differences in the value generated by a given investment project. The magnitude of these differences endorses the view that certain density levels in the set of backward linkages might be needed to propel the industry to new levels of value creation.

Once more, using the automobile industry as a framework of analysis, Varum (Chapter 14) examines buyer–supplier (B–S) linkages as a key arrangement inducing innovation and skills' development among domestic Portuguese and Spanish firms. Instead of looking at the transfer of technology, she looks at the development of capabilities at the organizational and managerial levels, and skills of workers of domestic firms, issues overlooked in the literature. Varum argues that B–S linkages motivated and forced domestic suppliers to develop their practices and capabilities. Specifically, buyers acted as a catalyst in promoting learning among domestic suppliers by setting and enforcing strict performance standards.

The final part of the book includes three studies mainly focused on policy-related themes. The first two chapters provide evidence on Central and Eastern Europe (CEE) countries whereas the last chapter (Chapter 17) is general in scope, framing multinationals within National Systems of Innovation, and discussing corresponding strategies and policies.

Männik and von Tunzelmann's study (Chapter 15) is concerned with the interaction between autonomy at the national/regional/local level, and autonomy between MNE parent companies and their subsidiaries. It analyses in detail the role of subsidiaries of foreign MNEs in five CEE countries (Estonia, Hungary, Poland, Slovakia and Slovenia) at the 'functional' level.

Their empirical work uses a database drawn from a questionnaire distributed in those five CEE countries covering 433 firms spread over a range of manufacturing sectors. The authors address multi-dimensionality in subsidiary autonomy, encompassing technology, marketing, managerial and financing dimensions of autonomy. The results support the hypothesis of the heterogeneity of autonomy. The authors highlight a non-linear relation between subsidiary autonomy and performance, stressing that excessive dependence on the parent company might impede the development of subsidiary's absorptive capacity while excessive independence might leave the local unit in a circle of 'internationally uncompetitive' knowledge.

During the past few years lowering corporate tax rates has been regarded as a key policy instrument to attract FDI of foreign MNEs in several countries, including the 'CEEC-5' (i.e. Czech Republic, Hungary, Poland, Slovak Republic and Slovenia). Tax rates tend to be an attractive policy tool for policy-makers because they can easily be changed and are thought to affect the behavior of economic agents immediately. In Chapter 16, Bellak and Leibrecht investigate whether there is a significant empirical relationship between corporate taxation and FDI. Their empirical study, which is based on a panel data set, includes the bilateral effective tax rates instead of the statutory tax rate and as controls mainly variables which intend to capture the differences in location (L) advantages of the CEEC-5. The authors focus on FDI from the main home countries (i.e., Austria, Germany, France, Italy, The Netherlands, United Kingdom and the United States of America) to the CEEC-5, because the latter are in the center of the ongoing public debate within the EU about an increase of (harmful) tax competition. The time span considered here ranges from 1996 to 2002. Using this panel of seven home countries, five host countries, and seven years, Bellak and Leibrecht confirm the importance of the tax rate as a FDI determinant.

The need to understand the qualitative contribution of MNEs' participation in the host economy, rather than the mere quantitative magnitude of FDI attraction, is emphasized by Pearce and Papanastassiou in Chapter 17. The authors outline an idealized approach to a Global Innovation Strategy (GIS) by a contemporary MNE, implemented through two stages each of which is articulated around a different type of R&D laboratory. In a first (pre-competitive) stage, the GIS is positioned around a network of Internationally Interdependent Laboratories (IIL) and seeks to contribute to achieving the first aim (or benefit) of globalizing innovation activity. In a second stage, the GIS is implemented through product mandate (PM) subsidiaries and associated Locally Integrated Laboratories (LIL). According to Pearce and Papanastassiou, the persistence of PM/LIL units often depends (externally) on the parent MNE group's ability to generate new innovation potentials, and (internally) on the host country's ability to support those aspects of its NSI that enable the subsidiary to continue to attract elements of the group's creative programs.

After such stimulating and encompassing contributions, we felt we need to set the record straight and ask whether public policy matters. This comes from a preoccupation with the fact that the vast majority of the literature, although extremely interesting and relevant, tends to fall short of suggesting practical and clear avenues for specific policy intervention. The term 'intervention' should not be misunderstood: here it is meant in a benign and constructive way, allowing market forces to flourish, but helping especially where information asymmetry, market failures and liabilities of newness and smallness (of, for instance, local and recently set up firms) prevent better developments. We think that public policy matters (when well planned in a systemic way, selective, targeted and coordinated), and will explain why (in Chapter 18), based on the topics focused on in this volume. Our perspective is positive, believing that there is always something to improve in order to foster growth, development and prosperity.

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Part I

Multinationals and Innovation

2

Knowledge Flows between Multinational Enterprises and National Innovation Systems: The Case of Austria[1]

Bernhard Dachs and Bernd Ebersberger

2.1 Introduction

The international business (IB) literature regards knowledge spillovers from foreign affiliates to domestic enterprises as one of the major benefits a host economy derives from the presence of multinational enterprises (MNEs) (Blomström and Kokko, 1998). This chapter deals with the opposite situation, and sets out to measure the extent to which innovative MNEs utilize the knowledge base of their host countries. We believe that spillovers from the host country to MNE affiliates are extremely relevant to science and technology policy. Given the fact that innovation is an interactive process that depends heavily on external sources (Edquist, 2005), spillovers may be one of the most important reasons for MNEs to undertake innovative activities at any particular location.

As a consequence, if innovative MNE affiliates mainly exchange knowledge within the group to which they belong, and have only little or no exchange with the host country, we may conclude that MNEs are not dependent on local knowledge in the innovation process. MNE research, development and innovation activities are therefore extremely mobile, and can be moved elsewhere to benefit from cost advantages without losing spillovers from the host country knowledge base. On the other hand, if we find strong links with domestic enterprises and universities, it may be an indication that the innovative activities of MNEs are less 'footloose' than the critics of globalization assume.

We will examine here the degree to which MNE affiliates are 'embedded' in the knowledge base of their host countries in the case of Austria, which is one of the countries where MNEs maintain a strong presence in science and technology. In 2002 about a third of all gross expenditure for R&D in the Austrian business enterprise sector was funded by sources from abroad (OECD, 2005), and 40 per cent of all Austrian patent activities can be attributed to MNE affiliates (Dachs and Schibany, 2004).

The chapter is structured as follows: Section 2.2 presents some theoretical considerations and empirical results on knowledge spillovers and foreign enterprises. Section 2.3 presents our data source. The methodology and results of the empirical analysis are laid out in Section 2.4. Finally, Section 2.5 draws some conclusions from the results for theory as well as policy.

2.2 Theoretical background and research hypothesis

There are two quite distinct bodies of literature in economics dealing with the internationalization of corporate innovative activities. The first consists of the IB literature focusing on explaining foreign direct investment (FDI) and the existence of MNEs. The second is made up of studies in the neo-Schumpeterian tradition, which regard knowledge diffusion between various actors as a crucial element in explaining innovation and technological change.

Knowledge plays a key role in the microeconomic approach in the IB literature (see, for example, Markusen, 2002). FDI, exports, licensing etc. are seen as different ways of utilizing superior, company-specific assets such as technology, products, brands, or superior management skills. These assets (or 'knowledge capital' in Markusen's terminology) may be the result of innovative activity in the home country. Superior assets give MNEs an advantage over local companies, enabling them to enter foreign markets. According to this view MNEs locate R&D and design facilities abroad in order to adapt existing products and technologies to local needs, tastes and regulations.

When MNEs make use of these assets by setting up affiliates and producing and selling products outside their home countries, parts of their superior assets spill over to domestic enterprises.[2] Spillovers emanating to domestic enterprises from the affiliates of MNEs are assumed to be a major benefit for the host economies from FDI and have been widely recognized as such in IB literature (see Blomström and Kokko, 1998; and Keller, 2004, for a review). According to Blomström and Kokko (2003), these spillovers are the strongest argument for countries to try and attract inward investment.

In contrast to this view a number of studies suggest that MNE affiliates' activities abroad also add to the company's existing stock of knowledge instead of merely utilizing it. This strategy has been labeled 'strategic asset seeking' (Dunning and Narula, 1995). An important part of this strategy for enterprises is not only to absorb spillovers from clients and competitors, but also from universities and other research institutes in the host country. The