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# Subsidiary research and development, and the local environment

Lee N. Davis<sup>a,\*</sup>, Klaus E. Meyer<sup>b</sup>

<sup>a</sup> *Department of Industrial Economics and Strategy, Copenhagen Business School, Solbjergvej 3,  
2000 Frederiksberg, Denmark*

<sup>b</sup> *Department of International Economics and Management, Copenhagen Business School, Howitzvej 60,  
2000 Frederiksberg, Denmark*

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## Abstract

Multinational enterprises (MNEs) increasingly seek to optimise their global innovative capabilities by incorporating subsidiary-specific advantages in different countries. But how important are the different location advantages for subsidiary investments in research and development? This paper adds to our understanding of the effects of commonly cited location advantages by analysing the degree to which they actually influence the incidence and level of subsidiary R&D. We developed hypotheses from the existing literature on location advantages, multinational R&D, and innovation incentives, and tested them in relation to an empirical data set containing over 2000 responses from subsidiary managers in seven countries in Europe. Four aspects of the local business environment were investigated: competitive conditions, supply conditions, scientific institutions, and government support. We found that only the presence of scientific institutions has a consistent, positive effect on the incidence and level of subsidiary R&D. Government support has a positive effect on the incidence of subsidiary R&D, but not its level. However, highly competitive environments have a negative effect, at least in small countries.

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*Keywords:* International R&D; Multinational enterprise; Subsidiary R&D; Location advantages

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## 1. Introduction

Multinational enterprises (MNEs) are no longer content, as in earlier decades, to develop new products and processes at home and transfer these innovations to foreign subsidiaries to adapt to local market needs. They increasingly seek

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\* Corresponding author. Tel.: +45-38-15-2547; fax: +45-38-15-2540.

to optimise their global innovative capabilities by incorporating subsidiary-specific advantages in different countries, sometimes engaging in major research at the subsidiary level. The literature on multinational R&D discusses a range of putatively valuable location advantages (e.g. Boutellier, Gassmann, & Von Zedwitz, 1999; Conference Board Europe, 1995; Florida & Kenney, 1994; Frost, 2001; Håkanson, 1992; Kuemmerle, 1999; OECD, 1998; Patel & Vega, 1999; Pearce, 1997; Von Zedwitz & Gassmann, 2002). But most of this work is based on either patent data or sources from MNE headquarters, not the responses of subsidiary managers. There is also an extensive general literature on the effects of different aspects of the local business environment on R&D (e.g. Porter, 1990; Von Hippel, 1988)—but none, to our knowledge, analyse these effects from the perspective of the subsidiary manager.

This paper adds to the literature on international R&D by analysing which of the commonly cited location advantages affect the incidence and level of subsidiary R&D, based on the questionnaire responses of subsidiary managers. To this end, we generated hypotheses from the literature on location advantages, multinational R&D, and innovation incentives, and tested them with subsidiary level data. The results have implications both for understanding multinational R&D, and the effects of industrial policy.

In its reliance on subsidiary assessments, this paper contributes to the emerging literature that takes a “subsidiary view” of the MNE (e.g. Andersson, Forsgren, & Pedersen, 2001; Birkinshaw, 2000; Birkinshaw & Hood, 1998a). The study employs data of the “Centres of Excellence” database,<sup>1</sup> which was constructed specifically to investigate the nature of the MNE as a “multi-centre” firm (e.g. Holm & Pedersen, 2000; Moore, 2001). The survey on which this paper is based contains responses from subsidiary managers in seven European countries: the UK, Germany, Austria, Sweden, Norway, Finland, and Denmark. Our approach differs from parallel research with this database in its focus of analysis. While prior studies have sought to illuminate the affiliate’s relationship with the parent MNE and with its local and global business partners from the affiliate’s point of view, they paid little attention to the effects of the local environment. An important exception is the recent contribution by Frost, Birkinshaw, and Ensign (2002), who investigate the factors (including the local environment) governing the emergence of centers of excellence in MNEs in Canada.

The paper explores two interrelated research questions. Which of four commonly cited location advantages—market competitiveness, supply conditions, scientific institutions, and government support—are inducing R&D by subsidiaries?

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<sup>1</sup> The main purpose of the “Centres of Excellence” (COE) database was to identify (and study) subsidiaries that have a strategic role that goes beyond their local activities, that function as a driving force for the further development within the MNE. In this paper, it should be emphasized, we focus not on whether particular subsidiaries represent “centres of excellence” per se, and which do not (this is the focus, for example, of Frost et al., 2002), but rather on identifying (and studying) those that perform R&D. Nor have we incorporated COE data from the Canadian MNE subsidiaries, to maintain our focus on the location effects of environmental conditions in Europe.

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