International Business Review 23 (2014) 76–90

Contents lists available at ScienceDirect

International Business Review

journal homepage: www.elsevier.com/locate/ibusrev

Knowledge sharing and subsidiary R&D mandate development: A matter of dual embeddedness

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ARTICLE INFO

Article history:
Received 30 September 2012
Received in revised form 15 March 2013
Accepted 8 August 2013

Keywords:
Dual embeddedness
Knowledge
Mandate
Multinational
R&D
Role evolution
Subsidiary

ABSTRACT

Sharing knowledge across borders has proven to be especially relevant to multinational corporations (MNCs). Foreign subsidiaries have become active players in these knowledge flows. However, the network effects of interacting with multiple agents on the evolution of the R&D role played by subsidiaries are still undeveloped. The present study focuses on changes in subsidiary capabilities and on the dynamic mechanisms by which their R&D role might evolve, especially, as a consequence of their interaction with a variety of knowledge networks. We examine this issue by conducting four longitudinal case studies of subsidiaries operating in Spain. Using an inductive approach to theory building, we develop a general theoretical framework considering the subsidiary's embeddedness in the knowledge networks within the MNC (internal) and within the host country (external). We find that evolving towards a competence-creating mandate is characterised by the simultaneous growth of embeddedness in both internal and external networks; otherwise, a subsidiary may gravitate away from upgrading its R&D role. Thus, the contribution of this paper is to present a dynamic model that sheds light on how internal and external knowledge embeddedness interact in generating outcomes for subsidiary R&D roles.

1. Introduction

The role played by subsidiaries and their competitive position within their respective multinational corporations (MNCs) are perceived as being subject to change over time. Historically, headquarters was considered the only source of competitive advantage for an MNC and this was leveraged overseas by the transfer of knowledge to foreign subsidiaries (Dunning, 1981; Vernon, 1966). Recently, linked to the closer integration of subsidiaries into international networks, the latter have been able to generate new knowledge for the whole MNC. In fact, heterarchical (Hedlund, 1986) and transnational (Bartlett & Ghoshal, 1989) corporate models reflect the existence of an internal network within the MNC, where knowledge flows freely in all directions. At the same time, the metanational corporate model (Doz, Santos, & Williamson, 2001) emphasizes the emergence of the company's external network. A subsidiary, thus, absorbs knowledge through its business linkages with local partners, which represent an important source of technological competencies enabling it to contribute to the MNC's overall capabilities (Andersson, 2003). Thus, the ability to manage dispersed capabilities effectively within this 'double network' – comprising internal and external networks (Zanfei, 2000) – is seen as the key to an MNC's competitive advantage (Frost, Birkinshaw, & Ensign, 2002). At the MNC level, this double network implies managing a portfolio of scattered capabilities in multiple heterogeneous local contexts through the corporation's affiliate units, whilst devising strategies to embed these units as efficiently as possible in each of these multiple contexts (Meyer, Mudambi, & Narula, 2011). At the subsidiary level, it implies that each of the subsidiaries plays a differentiated strategic role within the global MNC network.

Focusing on R&D activities, the International Business literature has recently identified the emergence of technologically advanced foreign subsidiaries (Blomkvist, Kappen, & Zander, 2010). Today, we see foreign subsidiaries not only as knowledge receivers, or in the terminology of Cantwell and Mudambi (2005) as the performers of a 'competence-exploiting' role, but also as knowledge creators in a fully integrated network (Di Minin & Zhang, 2010), fulfilling what Cantwell and Mudambi (2005) label as a 'competence-creating' role. This shift is important, as recent research highlights the more active role played by subsidiaries in the globalization of innovation, while examining their influence on MNC innovative ability (Blomkvist et al., 2010; Phene & Almeida, 2008). R&D networking allows firms to benefit mutually from each unit's R&D competences (Pla-Barber & Alegre, 2007).

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http://dx.doi.org/10.1016/j.ibusrev.2013.08.006

In this sense, the configuration of subsidiary R&D roles has become an issue of great interest in International Business research (see, for example, Bartlett & Ghoshal, 1990; Gassmann & von Zedtwitz, 1999; Gerybadze & Reger, 1999; Gupta & Govindarajan, 1991; Kuemmerle, 1997, 1999; Pearce, 1992; Sachwald, 2008; von Zedtwitz & Gassmann, 2002). However, the research presents two major shortcomings: first, most of the studies take a static approach. Since they are primarily concerned with identifying the specialised roles adopted by overseas R&D laboratories, they neglect the prior evolution of capabilities within the subsidiary that takes on this function (notable exceptions are Cantwell & Mudambi, 2005; Kim, Rhee, & Oh, 2011). But as the specific R&D role of a subsidiary is a direct outcome of this evolution, the way in which these capabilities are created must first be analysed. In this sense, it is widely acknowledged that technological capability building is the outcome of complex processes of interaction both within the firm and between the firm and external actors (Iammarino, Padilla-Perez, & Von Tunzelmann, 2008). This leads to the second shortcoming: many of the studies analyse the drivers of a subsidiary's R&D role in isolation and so neglect any network effect. Specifically, they identify three main factors in the configuration of strategic roles: task assignment by headquarters, the subsidiary's own choices and local environmental factors (Birkinshaw & Hood, 1998; Kim et al., 2011; Westney & Zaheer, 2001). However, less importance is attached to any underlying network effects, particularly those arising as a consequence of simultaneous engagement in internal and external networks.

While some authors have examined the effect of headquarters-subsidiary relationships and knowledge transfer between units of the MNC (Bartlett & Ghoshal, 1990; Gassmann & von Zedtwitz, 1999; Gerybadze & Reger, 1999; Kuemmerle, 1997, 1999; Pearce, 1992; von Zedtwitz & Gassmann, 2002), others have examined the impact of local embeddedness (Andersson & Forsgren, 2000; Andersson, Forsgren, & Pedersen, 2001; Andersson, Forsgren, & Holm, 2002; Andersson, Forsgren, & Holm, 2007; Dörrenbächer & Gammelgaard, 2010). However, only a few recent studies have considered their simultaneous impact on subsidiary innovation, albeit not specifically on their evolving R&D roles (see, for example, Birkinshaw, Hood, & Young, 2005; Gammelgaard, McDonald, Stephan, Tüselmann, & Dörrenbächer, 2012; Garcia-Pont, Canales, & Noboa, 2009; Helble & Chong, 2004; Yamin & Andersson, 2011). Only Wang, Liu, and Li (2009) analyse the role of subsidiaries within their internal and external networks, although they do so separately and statically. In sum, despite the increasing interest in taking a double-network approach to study MNCs, the analysis of the interface between internal and external network embeddedness has not been fully applied to the R&D strategic roles of a subsidiary, and even fewer studies adopt a dynamic approach.

To fill this gap in the literature, we develop an integrated framework that includes the interaction effects of changes in internal and external network embeddedness on a subsidiary's R&D role from an evolutionary perspective of competence mandates. Building on Wang et al.'s (2009) study and taking Dörrenbächer and Gammelgaard's (2010) work as our starting-point, we examine subsidiary R&D evolution patterns by analyzing the distinction between competence-creating and competence-exploiting typologies of subsidiary R&D mandates (Cantwell & Mudambi, 2005). Hence, we respond to recent calls to investigate the simultaneous change experienced by internal and external networks in models of coevolution (Madhok & Liu, 2006; Nell, Andersson, & Schlegelmilch, 2010). We address this issue by undertaking longitudinal case studies of four subsidiaries operating in Spain. Adopting an inductive approach to theory building (Yin, 1990), we find that the evolution towards a competence-creating mandate is characterised by the simultaneous growth of embeddedness in the local environment and in the corporate network; otherwise, a subsidiary may gravitate away from upgrading its R&D role. Thus, the main contribution of this paper is the development of a dynamic model that can illustrate how internal and external knowledge embeddedness interact to affect a subsidiary's R&D roles.

The paper is structured as follows: the next section develops our main theoretical argument regarding the interrelation between internal and external knowledge networks. Section 3 discusses our research methods. We then present the analyses and results of our case studies identifying four generic processes and developing propositions based on the underlying network drivers of each process. Finally, we present the inductively obtained model and highlight a number of conclusions and implications for future research.

2. Theoretical framework

2.1. External MNC network

The International Business literature has tended to emphasise the importance of environmental factors in determining MNC subsidiary roles and evolution (Birkinshaw & Hood, 1998; Cantwell & Mudambi, 2005; Kuemmerle, 1999; Pearce & Papanastassiou, 1999; Pearce, 1999). However, most of these studies treat the external context quite generally, seeing environmental forces just as a driver to concentrate R&D where local conditions are most conducive to technology creation (Cantwell & Kosmopoulou, 2001). In other words, most studies confide their interest in location issues at a country level and neglect firm-location interactions as a potential platform for leveraging environmental effects. In its relationships with local actors a subsidiary is exposed to new knowledge outside the organisation and this knowledge constitutes one of the key inputs for developing and accumulating the capabilities required for technological and organisational innovation (Andersson, Forsgren, & Holm, 2002). For example, Andersson, Björkman, and Forsgren (2005) report that external embeddedness has a positive impact on the development of products and processes in the MNC. Almeida and Phene (2004) suggest that a subsidiary's knowledge linkages with the host country have a positive effect on innovation in the subsidiaries of the MNC. And Santangelo (2009) concludes that local linkages creation is greater when subsidiaries have 'competence-creating scope' within the corporate organisational structure.

In sum, the reason why some subsidiaries achieve better innovative performance than others operating in the same environmental context can be explained by the frequency, depth and quality of subsidiary linkages to local partnerships. Thus, arguably, improvements in a subsidiary's R&D role depend upon effective integration within the local host country's environment rather than simply on siting activities in a munificent location (Cantwell, 2009). In other words, the potential of environmental factors as a source of competitiveness lies in a subsidiary's awareness of how to benefit from the welfare effects of the country's science base through a certain degree of embeddedness.

2.2. Internal MNC network

It is widely assumed that two of the key internal factors associated with subsidiary role development are subsidiary initiative-taking (Birkinshaw, 1997; Birkinshaw & Hood, 1998; Dörrenbächer & Gammelgaard, 2006), on the one hand, and parent company determinism in the allocation of mandates (Birkinshaw & Hood, 1998; Hood & Taggart, 1999), on the other. However, in terms of R&D roles, the mechanisms driving the evolution are not so straightforward: one argument advocates that subsidiaries with acknowledged advanced R&D mandates may enjoy higher levels of