

Global R&D activities of Japanese MNCs in the US: A triangulation approach

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Abstract

We examined 79 Japanese MNCs' R&D subsidiaries in the US from the knowledge-based view. We found: (1) subsidiaries' R&D strategies generally encouraged knowledge flows; (2) subsidiaries' R&D alliances promoted knowledge flows; (3) R&D subsidiaries with process-oriented incentives promoted vertical knowledge flows; (3) autonomous R&D subsidiaries promoted knowledge flows from the local environments to the subsidiary; (4) R&D subsidiaries with a high level of knowledge flows accumulated a high level of knowledge; and (5) R&D subsidiaries with a high level of accumulated knowledge achieved high overall performance. Our interviews with 30 R&D subsidiaries and 10 parent companies supplement these findings.

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1. Introduction

Traditionally R&D activities in multi-national corporations (MNCs) were centralized and concentrated in a home country, mainly because of supply-side reasons such as possible scale economies (Vernon, 1966; De Meyer, 1993) or higher appropriability of R&D efforts (Teece, 1987; Grandstrand et al., 1993). However, MNCs have been rapidly globalizing their R&D activities, especially for the last two decades.

A National Science Foundation study shows that US companies' investment in overseas R&D has increased three times faster than company funded domestic R&D over the last 10 years—10.1% versus 3.4%. Overseas R&D now accounts for 12% of the US industry's domestic R&D expenditures (NSF, 2004). The largest US (and European) R&D spenders are even more concentrated in foreign locations (>33%) (Roberts, 2001). JETRO (2003b) also reports that the number of overseas R&D subsidiaries by Japanese MNCs has been increasing approximately 10% annually for the past decade.³

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³ Furthermore, NSF (2004, Chapter 4) reports that foreign-owned R&D in the United States grew at an average annual rate of 10.8% from 1994 to 2000, compared with an average annual growth rate of 6.9% for U.S.-owned R&D overseas.

“Demand-side” factors seem to be replacing the supply-side factors as influences. Namely, in order to better serve diversified foreign demands, R&D activities must be decentralized (Grandstrand et al., 1993; Iwata, 1994). Kurokawa et al. (1999), Roberts (2001), and Hirschey and Caves (1981) report a positive relationship between foreign R&D activities and export shares on the foreign market.

Although these supply and demand-side considerations shed light on recent MNCs’ overall tendencies, such factors do not suggest *how to efficiently organize global R&D activities*. In an effort to fill such a gap in our understanding, this study investigates global knowledge flows in Japanese MNCs in the US, from the knowledge-based view (KBV) of the firm (Grant, 1996; Kogut and Zander, 1993).

This paper attempts to answer the following five research questions: (1) why knowledge flows are important in managing global R&D subsidiaries?; (2) what factors determine knowledge flows among R&D subsidiaries, headquarters (HQ), and other subsidiaries?; (3) what factors determine knowledge accumulations of R&D subsidiaries?; (4) what factors determine performance of R&D subsidiaries?; (5) how should R&D subsidiaries manage knowledge flows for higher performance?

In order to answer these questions, this paper has the following four major sections. First, the paper discusses global R&D activities by surveying the relevant literature. Second, it constructs hypotheses from KBV of MNCs. Third, it tests these hypotheses by using our survey data from 79 Japanese R&D subsidiaries in the US, supplemented by 30 interviews with these subsidiaries and 10 interviews with their parent companies. Finally, it concludes with managerial implications and observations for further research.

2. Theoretical framework and hypotheses

2.1. The knowledge-based view

External technical markets continue to become more global and efficient, mainly because of the advancement of IT-based communication and database methods. For example, web-based knowledge sharing sites, such as “Innocentive,” have been becoming popular outsourcing methods among MNCs for technological problem-solving. External markets, however, remain relatively ineffective mechanisms for knowledge sharing and transfer because: (1) specialized knowledge of firms tends to be tacit and thereby difficult to transfer: (2) market-based transfers of knowledge are often associated with

negative externalities such as involuntary expropriation and the risk of creating a new competitor (Teece, 1987).⁴

Hymer (1960) originally argued that MNCs’ *raison d’être* lies in the ability to exploit knowledge more efficiently internally than would be possible through external market mechanisms. Such a perspective emphasizes that globally dispersed R&D operations provide MNCs with competitive advantages not available in single-country centralized R&D operations (Brouthers et al., 2001; Dunning, 1995; Penner-Hahn, 1998), and that such a competitive advantage is based on how efficiently MNCs share knowledge across HQs and subsidiaries (Gupta and Govindarajan, 2000; Doz et al., 2001). Such a view can be called “the knowledge-based view (KBV) of MNCs.”⁵

In spite of the criticality of “knowledge shares and transfer within MNCs”—labeled henceforth as “knowledge flows”—we have a limited understanding of how to efficiently manage such knowledge flows. This is because only a limited number of studies have empirically investigated such knowledge flows, stemming from difficulties in accessing actual knowledge flows in MNCs. However, we identified nine studies that actually measured knowledge flows in MNCs and confirmed KBV. We briefly review these studies below—see Table 1 for summary.⁶

By studying 110 R&D subsidiaries in 15 Swedish MNCs, Nobel and Birkinshaw (1998) argue that effective knowledge flow methods (e.g., face-to-face) and directions (e.g., with other global R&D subsidiaries) vary depending on specific types of R&D subsidiaries (e.g., global creator). In their extensive study on 374 subsidiaries in 75 MNCs in US, Europe and Japan, Gupta and Govindarajan (2000) found that knowledge flows tended to be promoted by subsidiaries’ knowledge

⁴ Innocentive was originated by Eli Lilly in 1991 (see www.innocentive.com for details).

⁵ In line with such a perspective, Niosi (1999) emphasize “learning MNCs” from a global technology transfer perspective. However, “the knowledge-based view (KBV) of MNCs” is different from so-called “research on communications” (Allen, 1977; Allen and Katz, 1986) and the information-processing perspective (Galbraith, 1977), because neither research approach has ever discussed the importance of “communication” or “information flow” in terms of MNCs’ *raison d’être*.

⁶ Egelhoff (1988) examined knowledge flows between headquarters and subsidiaries of MNCs by focusing on control mechanisms. Rosenzweig and Nohria (1994) also studied HR practices in MNCs and found that knowledge flows affect subsidiaries’ HR practices. However, we excluded these studies from our review because they were not based on KBV.

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