

Exchange

From the Medical Industry Leadership Institute

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From the Director



Exchange is a new publication featuring a dialogue on medical industry research and application. The content is a

summary of research from both academia and the medical industry, followed by commentary on the importance of the research and its application for the industry. Topics highlighted in *Exchange* will span all sectors of the medical industry and include commentary from leaders of national firms and researchers from the University of Minnesota and other academic institutions. Our first issue highlights an article that appeared in *Strategic Management Journal*, by J. Myles Shaver from the Carlson School of Management, University of Minnesota and J. Penner-Hahn, Wayne State University, titled, "Does International Research and Development Increase Patent Output? An Analysis of Japanese Pharmaceutical Firms." Commentary is provided by Tamer Abdelgawad, Senior Manager, Economic and Policy Research, Pfizer Inc.

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The globalization of research and development

An analysis of Japanese pharmaceutical firms

The globalization of research and development (R&D) is increasingly recognized as an important firm strategy in many industries. Firms are taking R&D activities internationally to gain access to knowledge and capabilities not available in their own country. This trend has become important in recent years because of the perceived increase in technological sophistication throughout the world and the existence of specific expertise in particular countries or regions.

After the United States, the Japanese domestic pharmaceutical market is the second largest in the world and so provides an excellent context for our study. Our research examines the international R&D expansion activities, research capabilities, and patent output of 65 Japanese firms conducting pharmaceutical R&D between 1980 and 1991. Of the 65 firms, 30 are the largest Japanese pharmaceutical firms by sales. The other firms are non-pharmaceutical firms that engaged in pharmaceutical R&D (e.g., breweries conducting biotech pharmaceutical research). Our data came from publicly available sources and interviews of executives in 15 of the 65 studied companies. It is also important to note that we chose to exclude Japanese subsidiaries of European and U.S. pharmaceutical firms in our sample.

The time period chosen for our study is significant for two reasons:

- 1) The time period ushers in the beginning of significant change for the Japanese pharmaceutical industry (i.e., development of biotechnology,

changes in governmental payment policies, and increased foreign competition). These changes, along with increased competition and the fact that innovative products translate into higher revenues, motivated Japanese firms to undertake R&D.

- 2) We found no evidence of international R&D prior to 1980.

Our study discovered that firms with stronger pharmaceutical research capabilities prior to expanding internationally are most successful in acquiring new skills and technologies from their international R&D efforts. In fact, we found that firms lacking pharmaceutical research capabilities do not benefit at all from their international R&D efforts.

When one considers the effort and investment associated with international R&D, the international research efforts of firms weak in research capabilities reflected a very costly strategy. This tells a precautionary tale that although technological sophistication is increasing throughout the world and expertise resides in particular geographic regions, attempting to tap such expertise will not necessarily translate into success. Rather, attempts to tap such expertise are something that should be carefully and strategically considered.

Joan Penner-Hahn and J. Myles Shaver. "Does International Research and Development Affect Patent Output? An Analysis of Japanese Pharmaceutical Firms," *Strategic Management Journal* 26: 121-140 (2005).

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on medical industry
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Commentary

by Tamer Abdelgawad, Senior Manager, Economic & Policy
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In the research highlighted in this issue of *Exchange*, professors Penner-Hahn and Shaver attempt to answer the following important question about pharmaceutical R&D: Must firms already possess underlying research capabilities in order to generate innovative output from their international R&D activities? Using data on Japanese firms and their international drug R&D activity between 1980 and 1991, the authors answer the question in the affirmative—firms with underlying capabilities benefit from international R&D, while firms with no existing capabilities gain little or no innovative output from R&D investment overseas.

The findings of this research serve as an interesting potential input in corporate R&D decisions. Perhaps more importantly, the findings constitute a starting point for many additional critical research questions—

given differences in corporate cultures, could the results be replicated for American and European firms? How did the communication and information technology revolution that occurred, mostly after the study period, affect corporate ability to absorb and integrate international R&D? Does the particular location of international R&D matter to its success? If data on international R&D spending levels were used in the analysis, how would the results change? Do the results apply to all therapeutic R&D areas or are they unique to the specific biotechnology research of the sample period?

This is clearly an interesting research area with many open questions. I believe the pharmaceutical industry, in its efforts to adapt to a globally competitive and fast-changing R&D landscape, would highly value additional academic research and insights on this topic.