

# **A Comparative Study of the Japanese Pharmaceutical Industry with the National Innovation Survey Data**

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*Discussion Paper No. 43*

## ***Abstract***

The National Institute of Science and Technology Policy (NISTEP) conducted the “Japanese National Innovation Survey 2003” (J-NIS 2003) in 2003. Innovation here is defined as “new or significantly improved products (goods or services) introduced to the market” (product innovation), and “new or significantly improved process adopted in the enterprise” (process innovation). Survey questionnaires were sent to more than 43,000 enterprises with 9,257 responses (21.4% response rate). The summary results of J-NIS 2003 were published in the *NISTEP Research Material*, No. 110 in Japanese (with an English version to follow). In this Research Material, the industrial data, basically at the 2-digit SIC level, were reported; hence, pharmaceuticals were included in the chemicals industry. For two reasons, however, it is desirable to separate pharmaceuticals from other chemicals. The first is the idiosyncratic nature of pharmaceutical innovation, such as the high R&D intensity, the long and costly process of clinical research, and the close relationship with academics. The second is that, as is well-known, the industry is most closely related with life sciences and biotechnology, one of the four priority areas in Japan’s Science and Technology Basic Plan.

Thus, in this paper, we present the industry data for pharmaceuticals (drugs and medicines) and compare them to the average figures for the total economic activity and to those for manufacturing. It is warned, however, that the reliability of the data for pharmaceuticals may be limited because of the small number of respondents (98 enterprises).

Relatively to the total economic activity and to manufacturing, the main findings on the innovation of the pharmaceutical industry are summarized as follows:

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1. A larger proportion of enterprises actively performed innovation, with more emphasis on product innovation than process innovation.
2. As the effects of innovation, “increased range of goods or services” and “expanded market or increased market share” were raised most frequently, again suggesting the prevalence of product innovation.
3. The proportion of enterprises receiving public funding is rather smaller.
4. Co-operation agreements for innovation are made more actively. Many of them are made with universities (including other higher education institutes) and with the government or private non-profit research institutes. Also common are the agreements with competitors (*i.e.*, other enterprises within the same industry) and with commercial laboratories, R&D enterprises, and the suppliers of R&D support services. This fact suggests that the pharmaceutical industry is active in university-industry collaborations, alliances, outsourcing, and other co-operative arrangements for innovation. Also found is that, in pharmaceuticals, more firms consider these partners as important for their innovation.
5. Also, as a source of information for innovation, a larger proportion of enterprises consider universities and the government (including non-profit research institutes) as more important, as well as academic journals and professional meetings, suggesting that the industry is keen to introduce scientific achievements in their innovations. In addition, competitors, and commercial laboratories, R&D enterprises, and the suppliers of R&D support services are also regarded as important sources of information for innovation.
6. As disincentives to innovation activities, economic risks and innovation costs are most frequently raised. There is some indication that regulation is also considered as such a disincentive.
7. Patent applications are actively made in order to protect innovations. Trademarks are also used extensively.
8. As a method to ensure profits from innovation activity, many firms, reaching 85 percent among large firms (with 250 employees or more), raised patents. There are firms having made decision not to apply for patents; however, most commonly, the reason for this decision was the difficulty in presenting the novelty of innovations and not that they were afraid of legitimate detour inventions by others. Thus suggested is that, insofar as the in-

vention is patentable, patents are more effective means of appropriating the returns from innovation, compared to other industries.

9. Whether the product innovation is patented or not, it takes more time for other enterprises to accomplish alternative innovations.

[Note: All the tables have English titles and notations.]