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Impacts of the information-technology revolution on Japanese manufacturer–supplier relationships

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“Vertical keiretsu,” characterized by suppliers’ willingness to make customized investments, their long-term relationships with manufacturers and financial as well as personal ties between them, had been recognized as an important source of strength in Japanese industries. Our model predicts that, in contrast to the recent popular argument, the information-technology revolution can strengthen several aspects of “vertical keiretsu.” This is because the efficiency of designing customized parts can be significantly enhanced by suppliers’ IT investments such as the introduction of 3D CAD systems. Our interviews with Japanese manufacturers provide a support to this prediction. *J. Japanese Int. Economies* **18** (3) (2004) 390–415. School of Economics, The University of New South Wales, Sydney, NSW 2052, Australia; Ministry of Economy, Trade and Industry, Tokyo, Japan.
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1. Introduction

Japanese manufacturer–supplier relationships have been intensively studied throughout the 1980s, and a number of researchers have identified the cooperative relationships based

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on long-term relationships, suppliers' willingness to make customized investments, and financial as well as personal ties as their key features. Namely, Japanese manufacturers purchase intermediate products (or parts) repeatedly from a limited number of suppliers on a long-term basis, and the suppliers are willing to make investments specific to their purchaser in order to produce customized parts.¹ Also, Japanese manufacturers typically own partial shareholdings of their suppliers, and they tend to build close personal ties by transferring employees between manufacturers and suppliers (see, e.g., [Dyer and Ouchi, 1993](#)).

The Japanese manufacturer–supplier relationships characterized by these features have often been called “vertical keiretsu,” and regarded as a major source of strength in Japanese manufacturing industries. The MIT Commission on Industrial Productivity concluded, based on a number of case studies conducted in the late 1980s, that US manufacturers should establish Japanese-type cooperative relationships with their suppliers in order to regain their productive edge (see [Dertouzos et al., 1989](#)). Since 1989, the Chrysler Corporation has made a substantial effort to establish Japanese-type relationships with its suppliers. [Dyer \(1996\)](#) observed that, as a result, suppliers increased their investment in dedicated assets—plants, equipment, systems, processes, and people dedicated exclusively to serving Chrysler's needs.

In contrast, a number of people recently asserted that recent advances in information technology (call it IT revolution hereafter) would dramatically change the basic nature of Japanese manufacturer–supplier relationships. For example, a leading economist in Japan argued in a recent newspaper article that Japanese manufacturers would change the nature of parts required for their products from customized parts to standard parts, and would procure them from a larger number of potential suppliers through the internet rather than from a limited number of suppliers within their own corporate groups (or “keiretsu”).^{2,3}

¹ For example, [Dyer and Ouchi \(1993\)](#) found, based on their comparative study of the Japanese and the US automobile industries, that the Japanese suppliers were willing to invest in customized equipment and customer-specific human capital (e.g., let their own engineers develop significant partner-specific knowledge), and locate their plants quite close to the manufacturer. [Nishiguchi \(1994\)](#) obtained similar findings from his extensive comparative study of British and Japanese subcontracting in the electronics industry. Concerning long-term relationships, [Aoki \(1988\)](#) pointed out that only three firms exited from the association of first-tier Toyota suppliers between 1973 and 1984, whereas 21 firms entered. See also, e.g., [McMillan \(1990\)](#), [Cusumano and Takeishi \(1991\)](#), [Fujimoto \(1998\)](#).

[Asanuma \(1989\)](#) studied the Japanese automobile and the electric machinery industries and found that these two features are closely interrelated. According to his observations, as the extent of customization increases, the manufacturer–supplier relationships tend to become longer-term and more stable.

² Asahi Newspaper of September 18, 2000.

³ Also, [Steffensen \(1998\)](#) pointed out that, because of the IT revolution, Japanese manufacturer–supplier relationships would switch from stable relationships under closed informational networks to flexible relationships under open networks. [Araki and Makita \(2002\)](#) pointed out that, due to the rapid prevalence of the internet since 1995, “vertical keiretsu” type relationships are about to disappear in Japan. More broadly, the Information Economy Committee of Industrial Structure Council pointed out (in their report submitted to the Ministry of Economy, Trade and Industry) that the IT revolution reduces transaction costs between firms, which in turn reduces the advantage of closed corporate networks in which memberships are stable and limited, and increases the advantage of more open and flexible relationships. Note, this report was published as [METI \(2002\)](#). See also [Noguchi \(2002\)](#) for a similar argument.

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