

# The Strength of Long Ties and the Weakness of Strong Ties: Knowledge Diffusion through Supply Chain Networks\*

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## Abstract

This paper examines the effect of the structure of supply chain networks on productivity and innovation capability through knowledge diffusion, using large firm-level panel data for Japan. We find that ties with distant suppliers improve productivity, measured by sales per worker, more than neighboring suppliers, probably because intermediates from distant firms embody more diversified knowledge than from neighboring firms. Ties with neighboring clients improve productivity more than distant clients, probably because diffusion of disembodied knowledge from neighboring clients is more effective than from distant clients. By contrast, ties with distant suppliers and clients improve innovative capability, measured by the number of registered patents, while neighboring suppliers or clients do not affect it. In addition, density of a firm's ego network, which is measured by how densely its supply chain partners transact with each other, is found to have a negative effect on productivity and innovative capability, implying knowledge redundancy in dense networks. These results suggest importance of diversity of knowledge in knowledge diffusion.

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\* This research was conducted as part of a project entitled 'Empirical Analysis on Determinants and Impacts of Formation of Firm Networks,' undertaken at the Research Institute of Economy, Trade, and Industry (RIETI). The authors would like to thank RIETI for providing the firm-level data used in the analysis. Financial support from JSPS Kakenhi Grant (No. 25101003 and 26245037 for Todo and Matous, and No. 24530506 for Inoue) is gratefully acknowledged. The authors would also like to thank Martin Everett, Masahisa Fujita, Akie Iriyama, Johan Koskinen, Masayuki Morikawa, Garry Robins, Yukiko Saito, Ryuhei Wakasugi and seminar participants at the University of Tokyo, RIETI, and Waseda University for their helpful comments. The opinions expressed and arguments employed in this paper are the sole responsibility of the authors and do not necessarily reflect those of Osaka Sangyo University, RIETI, the University of Tokyo, Waseda University, or any institution with which the authors are affiliated.

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