

# **How does natural disaster experience impact spatial structure of supply chain network?**

## **Evidence from the Great East Japan Earthquake and expected Nankai Trough Earthquake**

**Keisuke Takano**

Graduate School of Systems and Information Engineering, University of Tsukuba/

TDB Center for Advanced Empirical Research on Enterprise and Economy, Hitotsubashi University

1-1-1 Tennodai, Tsukuba, Ibaraki, Japan/2-1, Naka, Kunitachi, Tokyo, Japan

+81-29-853-5572

s1211270.sk.tsukuba@gmail.com

**ABSTRACT.** This paper investigates empirically the interrelationship between the perception of a forthcoming disaster risk based on the actual disaster damage and the change in the spatial distribution of firm transactional networks (supply chains) by examining the Nankai Trough area after the Great East Japan Earthquake in the period 2009 to 2017. By adopting the propensity score matching and the difference-in-difference method, the study estimates the effects of tsunami damage on the magnitude of the spatial concentration or dispersion of the supply chain network stemmed from risk perception, measured by the inverse of the Herfindahl-Hirschman Index after 2011. The results show that the magnitude of the spatial concentration or dispersion of suppliers changes heterogeneously after 2011 largely dependent on firm size, which can indicate the barrier of the capacity constraint toward the pre-disaster preparation.

**Keywords:** Interregional trade, Supply chain, Disaster risk, Spatial pattern

**JEL code:** R12, Q54