Measuring the Systemic Risk in Interfirm Transaction Networks*

Makoto Hazama †   Iichiro Uesugi ‡
November 27, 2012

Abstract

Using a unique and massive data set that contains information on interfirm transaction relationships, we examine default propagation along the trade credit channel and for the first time provide direct and systematic evidence of its existence and relevance. Not only do we implement simulations in order to detect prospective defaulters, we also estimate the probabilities of actual firm bankruptcies and compare the predicted defaults and actual defaults. We find, first, that an economically sizable number of firms are predicted to fail when their customers default on their trade debt. Second, these prospective defaulters are indeed more likely to go bankrupt than other firms. Third, a certain type of firm-bank relationships, in which a bank extends loans to many of the firms in the same supply chain, significantly reduces firms’ bankruptcy probability, providing evidence for the existence and relevance of “deep pockets” as documented in Kiyotaki and Moore (1997).

Keywords: interfirm networks, trade credit, default propagation

JEL classification: E32, G21, G32, G33

---

*Preliminary. This study is a product of the project “Design of Interfirm Networks to Achieve Sustainable Economic Growth” under the program for Promoting Social Science Research Aimed at Solutions of Near-Future Problems conducted by the Japan Society for the Promotion of Science (JSPS). The authors are grateful to Tsutomu Watanabe, Makoto Nirei, Daisuke Miyakawa, Shin-ichi Fukuda, Takatoshi Ito, Kosuke Aoki, Kaoru Hosono, Arito Ono, Hirofumi Uchida, Peng Xu, Hikaru Fukanuma, Keichi Yoshimura, Ralph Paprzycki, and participants at the SWET workshop, the RIETI study group, and the DBJ RICF seminar for their helpful comments and suggestions. The authors are also grateful to Teikoku Data Bank Incorporated, especially, Masahiro Miyatani, Taro Aihara, Takuro Kitou, Takashi Suzuki, and Goro Komatsuzaki for data provision and research collaboration.

†Graduate School of Economics, Hitotsubashi University. Email: hit-tdb@ier.hit-u.ac.jp.
‡Institute of Economic Research, Hitotsubashi University. Email: inesugi@ier.hit-u.ac.jp.