Environmental Engineering and Management Journal

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

ENHANCING GREEN PRODUCTIVITY THROUGH SUPPLY CHAIN DIGITALIZATION

Ding Li[1], Han Yan[2*], Shenglin Ma[3]

[1]*School of Economics and Management, Heilongjiang Bayi Agricultural University, 5 Xinyang Road, Daqing, Heilongjiang 163319, China*
[2]*School of Business, Nankai University, 94 Weijin Road, Tianjin 300071, China*
[3]*School of Economics and Management, North University of China, 3 Xueyuan Road, Taiyuan, Shanxi 030051, China*

Abstract

With the rapid development of digital technology, supply chain digitalization has become a key strategic choice for firms seeking to adapt to contemporary changes. Leveraging the "Supply Chain Pilot Policy" introduced by the Chinese government as an exogenous policy shock, and using data on Shanghai and Shenzhen A-share listed firms from 2013 to 2023, we empirically examine the effect of supply chain digitalization on green total factor productivity (GTFP). The results remain robust across a series of validity checks. Mechanism analysis reveals that supply chain digitalization enhances GTFP by lowering external transaction costs and strengthening firm competitiveness. Heterogeneity analysis shows that this effect is more pronounced in growth- and mature-stage firms, in firms with stronger governance, lower supply chain concentration, and in more competitive markets. Finally, the economic consequence analysis indicates that by improving GTFP, supply chain digitalization significantly increases firm value.

Key words: competitive advantage, green total factor productivity, quasi-natural experiment, supply chain digitalization, transaction costs

Received: July, 2025; Revised final: November, 2025; Accepted: December, 2025

* Author to whom all correspondence should be addressed: E-mail: Haccept@163.com