

The Hong Kong Polytechnic University
Department of Logistics and Maritime Studies
Research Seminar

Blockchain Design for Supply Chain Management

by

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Date: 6 August 2018 (Monday)
Time: 10:30am - 11:30am
Venue: R401, Shirley Chan Building
The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

Blockchain research is still in its infancy stage, with most exiting work focused on security and scalability and few applications for controlling physical devices. Very scant research looks at its impact and design issues on management perspectives, especially from the perspective of Supply Chain Management. To investigate the impact of blockchain technology (BCT) on supply chain performance and the inherent design issue, we study a generic stochastic model, where a manufacturer seeks to maximize the total expected discounted profit, by jointly managing (i) blockchain design, (ii) production or ordering decision, and (iii) dynamic pricing and selling. The leverage of blockchain can help firms reduce order quantity, lower selling price and reduce the target inventory level to carry over. It is also shown that the volatility pertaining to either supply or demand market will lower the expected profit. While facing higher volatility, the firm prefers to leverage high degree of blockchain. Finally, our numerical study illustrates rich managerial insight. For example, considering tech-savvy customer behavior, some types of goods (e.g., credence goods and experience goods) appreciate BCT, but it might not be beneficial to leverage BCT for some others (e.g., Search goods); considering the lifecycle of the product, it is recommended to adopt BCT as early as possible and leverage a higher adoption degree at an earlier stage; high volatility of supply chain (e.g., yield and demand) raises the intension to adopt BCT.

Bio:

Dr. Jim Shi is an associate professor of Supply Chain Management at the Tuchman School of Management of NJIT. Prior to joining with NJIT in 2014, Dr. Shi was an assistant professor at the Robinson College of Business at Georgia State University. Dr. Shi was a visiting scholar at Hong Kong University of Science and Technology and a visiting professor at the Rotman School of Management at the University of Toronto. Recently, Dr. Shi has received Excellence in Teaching Award and Outstanding Research Award, from both the school and university levels at NJIT.

His research interest lies in (1) Supply Chain Management, (2) Blockchain impact on Supply Chain management, (3) Container Shipping and Logistics, (4) Interface between Finance and Supply Chain Management, (5) Continuous Manufacturing/Production, (6) Agribusiness and Agricultural Supply Chain Management, (7) Green Supply Chain and Sustainability. His research has been supported by several federal and government grants, such as United States Department of Agriculture (USDA) and Leir Research Foundation, etc.

His scholarly articles have been published in a variety of prestigious journals such as Operations Research (OR), Manufacturing & Service Operations Management (MSOM), Production and Operations Management (POMS), Naval Research Logistics (NRL), Annals of Operations Research, IEEE Transactions, Omega, European Journal of Operational Research (EJOR), Operations Research Letter, among others. Dr. Shi's research introduces major initiatives in (1) blockchain applications in supply chain management; (2) helping to develop new product design with recyclable/green materials, (3) tackling development of agricultural supply chain for African Agribusinesses, e.g., coffee supply chain, and (4) taking data-driven research to solve problems with container shipping logistics and operations.

Dr. Shi has been refereeing for many journals in the field, including but not limited to: Operations Research, Manufacturing and Service Operations Management, Naval Research Logistics, Production and Operations Management, Annals of Operations Research, Operations Research Letter, Mathematical Methods of Operations Research, IEEE Transactions on Engineering Management, DSJ and IJPR. He has been invited and chaired a variety of prestigious international conferences, such as MSOM, POMS annual conference, INFORMS annual conference, DSI annual conference, INFORMS International conference, etc.

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All are welcome!