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EDUCATION

2014/01 – 2022/09 Ph.D. Dept. of Industrial and Systems Engineering, Chung Yuan Christian Uni., Taiwan

2009/09 – 2013/07 B.A. Industrial Engineering, Faculty of Tech. Industry, Petra Christian Uni., Indonesia

HONORS & AWARDS

2022 The Phi Tau Phi Scholastic Honor Society of Republic of China

RESEARCH INTEREST

My research field is around supply chain systems modeling and optimization catered to the modern business environment. I have done a number of modeling works, covering various supply chain problems, such as (1) SCND works of forward and reverse supply chain, (2) green IRP model, and (3) competition model between remanufacturing systems. It should be noted that various supply chain systems formulated in these works involve the management of complex operations. In addition, results obtained from these works show that environmental policies and uncertain conditions could significantly cause different performance outcomes for the supply chain systems. Therefore, this has emphasized the need for comprehensive modeling and optimization methods that can be adjusted to various conditions. The right strategies, combined with the optimization of integrated decision-making (e.g., from strategic to operational decision levels), are necessary to deliver the best-practice solutions (e.g., the best-known alternatives for both economic and environmental performance), especially in the nowadays fast-paced business and advanced technological developments. Such modeling approaches will be crucial in facilitating sustainable supply chain development, transitioning the business model to the circular economy, and realizing environmental improvement goals, such as net-zero plans.

RESEARCH HIGHLIGHTS

1. Modeling of modern supply chain network using postponement concept

Modern business traits have shaped companies' reliance on the large and complex global supply chain network (SCN). To function properly, SCN has to perform responsive and efficient operations against risks of uncertain conditions while reducing carbon emission production. In addressing these issues, postponement strategies are adopted in SCN design modeling studies to (1) realize environmentally friendly SCN ^[1] and (2) enable responsive operations against uncertainty risks ^[2]. These studies mainly optimize the configuration of a globally dispersed multi-tier SCN and the multi-period operations planning, involving procurement, processing, and sales decisions. Computational examples of the notebook computer SCN show that the optimized SCN configuration with the right postponement strategies can reduce excess processes, lost sales, and deadstock, and increase inventory turnover rate, allowing more resilient SCN against uncertainty risks. Postponing product differentiation also reduces excessive processes and emissions, allowing an eco-efficient SCN that adheres to environmental policies.

Reference: [1] Budiman & Rau, 2021, [2] Budiman & Rau, 2019

2. Improvement of reverse supply chain system sustainability with postponement strategy

Issues of resource depletion and waste piling have grown at an alarming rate, especially in the cases of product wastes with significant residual values. To address these issues, stakeholders have focused to develop a reverse supply chain (RSC) system that can sustain profitable takeback, reuse, and recycling operations in the long term. One way in realizing these capabilities is by incorporating postponement concepts into the integrated RSC network, allowing the delay of operations susceptible to demand uncertainty. Numerical examples of the notebook computer RSC demonstrate that utilizing the right operation postponement can increase the network's flexibility, allowing better economic performances even under stricter environmental (product takeback) regulations. The better RSC management then can be used to improve waste management and support the sustainable supply chain system.

References: Rau, Budiman, & Monteiro, 2021

REPRESENTATIVE PUBLICATIONS (*: corresponding author)

1. **Budiman, S. D.**, & Rau, H.* (2021). A stochastic model for developing speculation-postponement strategies and modularization concepts in the global supply chain with demand uncertainty. *Computers & Industrial Engineering*, 158, 107392. doi:10.1016/j.cie.2021.107392
2. Rau, H.*, **Budiman, S. D.**, & Monteiro, C. N. (2021). Improving the sustainability of a reverse supply chain system under demand uncertainty by using postponement strategies. *Waste Management*, 131, 72-87. doi:10.1016/j.wasman.2021.05.018

3. **Budiman, S. D.**, & Rau, H.* (2019). A mixed-integer model for the implementation of postponement strategies in the globalized green supply chain network. *Computers & Industrial Engineering*, 137, 106054. doi:10.1016/j.cie.2019.106054
4. Rau, H.* , **Budiman, S. D.**, Regencia, R. C., & Salas, A. D. P. (2019). A decision model for competitive remanufacturing systems considering technology licensing and product quality strategies. *Journal of Cleaner Production*, 239, 118011. doi:https://doi.org/10.1016/j.jclepro.2019.118011
5. Rau, H.* , **Budiman, S. D.**, & Widyadana, G. A. (2018). Optimization of the multi-objective green cyclical inventory routing problem using discrete multi-swarm PSO method. *Transportation Research Part E: Logistics and Transportation Review*, 120, 51-75. doi:https://doi.org/10.1016/j.tre.2018.10.006
6. Wee, H. M.* , Budiman, S. D., Su, L. C., Chang, M., & Chen, R. (2016). Responsible supply chain management – an analysis of Taiwanese gutter oil scandal using the theory of constraint. *International Journal of Logistics Research and Applications*, 19(5), 380-394. doi:10.1080/13675567.2015.1090964

Others (conference papers)

7. Rau, H., & Budiman, S. D. (2021). Development of Reverse Logistics Supply Chain Network with Postponement Strategies for Multiple Remanufactured Products. Paper presented at the 2021 International Conference on Resource Sustainability (Virtual), University College Dublin, Ireland. icrs2021dublin.ucd.ie
8. S. D. Budiman, & Rau, H. (2017). Modeling of reverse logistics system for modular products under emission consideration. Paper presented at the Going Green EcoDesign 2017: 10th International Symposium on Environmentally Conscious Design and Inverse Manufacturing, Taiwan.