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Special issue Editorial: Logistics and supply chain management in an era of circular economy

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ABSTRACT

This special issue explores important issues in logistics and supply chain management for transitioning to a circular economy. This editorial note first explains the background of and motivation for the special issue, and then introduces the featured research articles.

1. Background and motivation

Recently, the circular economy (CE) concept has been implemented by major economies such as China and the European Union for addressing resource scarcity and environmental issues related to economic development. In comparison with a linear make-use-dispose model which is prevalent, the CE drastically improves resource efficiency by circulating biological and technical materials in regenerative cycles (*e.g.*, organic composting) and restorative cycles (*e.g.*, remanufacturing and recycling), respectively (Ellen MacArthur Foundation, 2015). By maximizing the utilities of resources, the CE reduces the demand for natural resource extraction. At the same, it returns biological nutrients to preserve the earth's nature capital (Ellen MacArthur Foundation, 2015). Therefore, it offers a plausible pathway to decouple resource consumption from economic growth.

Many large corporations including Apple and Dell, just to name a few, have embraced CE to improve environmental sustainability in their operations and supply chains. Transitioning to circular supply chain management (SCM) (CSCM), *i.e.*, "*the integration of circular thinking into the management of the supply chain and its surrounding industrial and natural ecosystems*" (Farooque et al., 2019), has become a major trend among global business leaders (Aronow, Ennis, & Romano, 2018). Reverse logistics is expected to play a pivotal role in CSCM because of increased flows of end-of-life and end-of-use product returns. Renewable energy will replace fossil fuels for powering logistics and supply chain activities in the CE.

The emerging CSCM concept integrates the CE perspective into the research and practice of green SCM (Srivastava, 2007) and sustainable SCM (Seuring & Müller, 2008). It extends the boundaries of closed-loop SCM (Guide & Van Wassenhove, 2006) to use third parties, apart from original equipment manufacturers, for value recovery operations (Genovese et al., 2017; Batista et al., 2018). By using both open-loop and closed-loop circuarity (Farooque et al., 2019; Zhang et al., 2021), CSCM offers a much wider scope and

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greater potential to improve resource circularity.

Despite rapid developments in recent years, the CSCM research domain is still nascent. The adoption of CE is gathering pace in many firms and supply chains, but a variety of implementation challenges need to be overcome. For example, the COVID-19 pandemic and the subsequent restrictions imposed by the governments caused tremendous supply chain disruptions across the globe. The rising geopolitical risk, particularly the one triggered by Russia's invasion starting a war in Ukraine in February 2022, has led the world into a period of great uncertainty and rising inflation. In response, many businesses have already adjusted, or are rethinking their global supply chain configurations. These developments have profound implications for managing global logistics and supply chains in transitioning to a CE.

2. Insights on logistics and SCM for a CE

This special issue publishes original research on logistics and SCM relating to the CE. We received over 50 submissions. After undergoing TRE's rigorous manuscript screening and peer-review process five articles were accepted for the special issue. We briefly introduce them here.

Stekelorum et al. (2021) use dyad survey data from 404 firms in France to examine the role of supplier capabilities for buyer firms to improve their CE practices. The research investigates how the suppliers' big data analytics capabilities and supply chain ambidexterity support the buyer firms' responsible governance for improving CE practices. The findings suggest that the focal firm's supplier-selection mechanism, instead of its supplier-development mechanism, has a significant and positive impact on its CE practices. Therefore, in a CE implementation, the focal firms should consider sustainable selection criteria as well as supplier capabilities in the tendering process.

Zhang et al. (2021) conduct a review to compare the state-of-the-art CSCM practices and research. The literature sample includes Ellen MacArthur Foundation's collection of 68 CE implementation cases and 124 academic papers in high-ranking operations and supply chain journals. The review establishes CSCM as a multi-dimensional construct encompassing closed-loop SCM, remanufacturing SCM, recycling SCM, reverse SCM, and industrial symbiosis. Based on the identified research-practice gaps, this study calls for empirically-driven and context-specific studies in CSCM. It also advocates more CSCM research relating to industrial symbiosis, product circularity assessment, performance implications, and consumer behaviors, among others.

Using a Delphi method, Gebhardt et al. (2022) explore the potential of CE to reduce dependencies in supply chain networks. Based on the assessments of 78 experts from 12 countries, they suggest that the likely implemented CE practices by 2030 are not aligned with the 4R (reduce, reuse, recycle, recover) framework's value retention hierarchy. The implementation of CE practices is mostly influenced by regulatory factors, financial considerations, customer requirements, technology usage, and product design. CE practices can enable supply chain resilience by obtaining alternative supplies through recycled materials and components.

Luthra et al. (2022) employ a multi-method approach to explore the barriers to cross-sector collaboration in CSCM, an unexplored area in the literature. They identify governance barriers and contextual barriers as causal factors in India. The study highlights the necessity of collaborative efforts across sectors, which are often neglected in the supply chain collaboration literature. It recommends effective strategies for managing cross-sector collaboration for CSCM such as supportive government regulations and policies, collaborative value creation, and applying Industry 4.0 technologies.

Feng et al. (2022) develop an integrated multi-criteria decision-making (MCDM) method for managing recyclable waste transport vehicles. The research is motivated by the need of optimizing parking locations for recyclable waste transport in a Chinese city. Through extensive experiments, they find that the integrated MCDM method outperforms the traditional location allocation model. Specifically, the integrated MCDM method has advantages in reducing cost of transporting recyclable waste and improving transport efficiency.

CRediT authorship contribution statement

Abraham Zhang: Writing – original draft. **Janet Hartley:** Writing – review & editing. **Yulan Wang:** Writing – review & editing. **Shuaian Wang:** Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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