Special Issue Editorial: Empirically grounded research in logistics and supply chain management for a circular economy

Introduction

As a sustainable alternative to the extractive linear (extract-make-use-dispose) economic model, the circular economy (CE) has been increasingly embraced by policymakers and business leaders across the globe. The CE is driven by intentional design, aiming to drastically improve resource efficiency by restoring technical materials and regenerating biological materials to keep them in circulation instead of sending them to a landfill as in a linear economy (Ellen MacArthur Foundation, 2015). Although transitioning to a circular supply chain (CSC) is an influential topic among global business leaders (Aronow, Ennis & Romano, 2018), the 2023 circularity gap report (Circular Economy, 2023) suggests that only 7.2% of the global economy is circular. This is lower than 9.1% in 2018 and 8.6% in 2020, suggesting that transitioning to CE is easier said than done.

Despite surging research interest, circular supply chain management (CSCM) is confronted by many practical challenges and under-researched questions (Farooque, Zhang, Thürer, Qu, & Huisingh, 2019). Unfortunately, the relevance gap (Tranfield & Denyer, 2004) is prominent in CSCM research hindering its development. Often dominated by recycling, there is a limited understanding of the broader view of CSC (Lima, 2022) and CSC theory development (Pansera & Genovese, 2020) highlighting the need for more empirical research. A recent review of CSCM publications shows that empirical research articles are only about 9% in the leading logistics, operations and supply chain management (SCM) journals (Zhang et al., 2021). The dominate modelling research articles typically examine abstract problems without specifying a specific country or industry context. Due to this apparent and urgent need for more empirically grounded research, the guest editors called for papers and edited this Special Issue.

The accepted special issue papers will be briefly described, followed by and exploration of some overarching themes. Finally, we point to research directions for circular economy and CSCM.

Insights from the Special Issue

The Special Issue includes 12 research papers and one literature review paper that passed the double-blind review process of the journal. The collected research papers involve a wide range of research methods, but all of them use empirical data which is in line with the theme of the Special Issue. We briefly summarize the insights from these contributions. We hope this Special Issue will stimulate further research to advance the CSCM research domain and the circularity cause in the society.

Bhattacharya and Kalakbandi (2022) follow a grounded theory methodology to study barriers to CSCs in the unorganized tire retreading industry in India. The research discovers 10 critical barriers, among which the two most vital ones are the “lack of effective promotional methods” and the “poor implementation of standards.” The unique results show that some barriers to CSCs are context-specific. This study makes a theoretical contribution by highlighting the effects of contexts in applying the stakeholder and institutional theories. Policy and managerial interventions are discussed for overcoming the barriers.

Adopting a complex adaptive systems perspective, Ciccullo et al. (2023) explore why and how start-ups design CSCs. Case studies of five Italian start-ups in the fashion and construction industries show their CSC design employ open and closed–loop circularity logic. The study discovers three different coordination roles played by the start-ups such as orchestrator, integrated orchestrator, and circular manufacturer. The findings inform entrepreneurs on how to innovate business models to design and coordinate CSCs.

De Vass et al. (2022) use the 10R framework and a soft-hard continuum to study drivers and barriers to CE adoption in the wood sector. Case studies of three Australian wood-based companies show that the implementation of CE practices can be successfully driven by business leaders who are committed to the CE despite a regulatory void. Supply chain collaboration with customers and value recovery operations is necessary for maximizing value retention.

Dohale et al. (2023) analyze the enablers for implementing CSCs in the Indian apparel industries. Ten enablers are identified by using the Delphi method and their interrelationship are analyzed by the neutrosophic interpretive structural modeling (N-ISM) method. The results suggest critical enablers including supportive legislative framework, understanding CE’s economic benefits, and knowledge and research support.

Dwivedi et al. (2023) analyze factors for sustaining CE practices in the COVID-19 pandemic in India. Through a mix-method approach, they find five most influential factors such as continued stakeholder pressure, CE and sustainability culture, sustained implementation of cleaner technology, feedback system, and CE training for overcoming resilience issues.

Through the lens of the stakeholder theory, Fobbe and Hilletofth (2022) conduct multiple case studies of Swedish manufacturers about how to transform stakeholder engagement practices in the CE context. They find that manufacturers need to change not only resource flows, but also stakeholder engagement, from linear to circular. The study offers insights about how to extend, expand, and level up stakeholder engagement for driving the CE transition.

Extending the concept of supply chain followership, Gong et al. (2023) study Tetra Pak’s Chinese recyclers who recycle used beverage cartons. Analyzing their differences in critical thinking and engagement approaches, the research identifies four supply chain followership styles: exemplary, conformist, passive, and alienated. The findings establish supply chain followership as a dynamic concept. Supplier

performance can be improved when a supplier aligns its supply chain followership style with a customer' leadership style.

Kouhizadeh et al. (2022) investigate how the blockchain technology can support CE performance assessment. Using an inductive theory building approach, they analyze survey data from 32 CE and blockchain experts. The study identifies four major blockchain capabilities, namely, reliability and security, transparency and traceability, smart contracts, and incentivization and tokenization. A framework is developed to synthesize the relationship between blockchain and CE performance to guide future technology applications.

Le (2022) develop a conceptual model exploring big data-driven SCM's relationship with sustainability performance. The model is tested using survey data from 495 small and medium-sized enterprises in the Vietnamese food sector. Results show that supply chain big data applications positively, directly and indirectly, contribute to sustainable corporate performance. Apart from a direct and positive effect on sustainable SCM, CE thinking moderates the relationship between big data-driven SCM and sustainable SCM.

Using real-world data from Germany, Lehner and Elbert (2022) simulate how a digital platform facilitates pallet exchange across different industry sectors. With increased collaboration, supply chain circularity can be improved by reducing total transport distance and the resources required in the pallet exchange system. The findings from the simulation demonstrate the benefits of a digital platform and cross-sector collaboration.

Luo et al. (2022) conduct a longitudinal study in New Zealand about food waste and SCM during the COVID-19 pandemic. They identify four consumer segments (rational opportunists, impulsive consumers, economic consumers, and spendthrift consumers) who have different food purchase and consumption habits, and consequently, different waste generation patterns. The study makes a theoretical contribution by developing a refined conceptual model of consumer segmentation for reducing food waste.

From a dynamic capability view, Samadhiya et al. (2022) develop a conceptual model about the impact of total productive maintenance (TPM) and industry 4.0 (I4.0) on the transition to the CE. Using survey data from 304 Indian manufacturers, the study tests the conceptual model and finds that I4.0 positively impacts TPM, CE, and sustainable performance. In addition, CE plays a partial mediation role between I4.0 and sustainable performance and between TPM and sustainable performance.

Zhang et al. (2023) review 1,130 journal articles on CSCM published till 2021. Using bibliometric analysis tools, the study maps out the development trends in the domain and identifies five prominent research clusters related to reverse channel optimization and closed-loop and circular SCM. The research clarifies the boundaries of the interrelated supply chain sustainability terms such as closed-loop SCM (Guide & Van Wassenhove, 2006), green SCM (Srivastava, 2007), and sustainable SCM (Seuring & Müller, 2008). Significant research gaps are found especially in the utilization of longitudinal and secondary data, behavioral experiment, and action research. More

studies are also required in the under-researched topics including reuse, sourcing and supply management, circular product design, industrial symbiosis, and zero waste.

Table I summarises the contributions in the Special issues on the aspects of topic/study focus, methodology, and empirical field.

Table I. A summary of contributions in the Special Issue

Authors	Topic/study focus	Methodology	Empirical field
Bhattacharya & Kalakbandi	Barriers to CSC	23 interviews	Tire retreading industry in India
Ciccullo et al.	CSC design and value creation	Five case studies	Companies in Italy
De Vass et al.	Collaboration for implementation of 10Rs	Three case studies	Wood sector in Australia
Dohale et al.	Enablers for implementing CSCs	Delphi-study and neutrosophic interpretive structural modeling	Apparel industry in India
Dwivedi et al.	Influential factors for CE	Expert interviews for DEMATEL	India
Fobbe and Hilletofth	Stakeholder engagement for CE transition	Three case studies	Manufacturers in Sweden
Gong et al.	Supply chain followership styles	14 interviews	Food processing and packaging company and suppliers in China
Kouhizadeh et al.	Blockchain supporting CE performance assessment	Survey	CE and blockchain experts across the globe
Le	Big data, corporate performance	Survey	Companies in Vietnam
Lehner & Elbert	Cross-sector collaboration	Simulation	Pallet exchange Germany
Luo et al.	Consumer segmentation for food waste	Longitudinal study, first survey, then interviews	Consumers in New Zealand
Samadhiya et al.	Dynamic capabilities for total productive maintenance	Survey	Companies in India
Zhang et al.	Five prominent research clusters on CSC	Bibliometric analysis	Academic journal papers on CSC

Contributions and Research Directions

As the call for papers focused on empirical research on the CE and CSCM, it is great to receive and accept papers using different empirical methods including interviews, case studies, surveys, and empirically-based simulation. The data also represent diverse industries and geographical regions. While four papers use data from India, all others build on data from almost around the globe. One gap and a future opportunity is that contributions from Africa and South America are missing.

The papers employ a wide range of theoretical approaches. While several studies use performance measures, there seem to be multiple directions on achieving performance and exploring and explaining how it would be reached. Stakeholder (Fobbe & Hilletofth, 2022) and resource-based, such as dynamic capabilities (Samadhiya et al., 2022), approaches are well established in logistics, operations and SCM research. The typical debate on what drives and hinders sustainability-related measures in sustainable or circular supply chains is evident but is a starting point for researchers (Bhattacharya & Kalakbandi, 2022; Dohale et al., 2022; Dwivedi et al., 2022), where much has been published already. Collaboration in CSCM is garnering attention (Lehner & Elbert, 2022; De Vaas; for a review see Sudusinghe & Seuring, 2022), where the idea of supply chain followership styles (Gong et al., 2022) makes an interesting point. Collaboration is a promising area warranting future research by e.g. building on collaboration and integrations logics already available in the SCM domain. Although traditional supply chain research often uses a focal firm approach, CSC research also needs to be connected to the consumers (Luo et al., 2022).

Only two papers build on the now much discussed aspects of digital transformation, where Le (2022) examines big data, while Kouhizadeh et al. (2022) analyse the potentials of blockchain-based solutions. The intersection of digital and sustainable transformation is a promising research direction crating many open questions in the CSCM field.

Overall, we are sure that the topic of this special issue needs further exploration and research, so our goal is to provide a starting point stimulating more research on CSCM-related topics.

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