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Circular Supply Chain Management and Circular Economy: A conceptual model

Mohd Rizaimy Shaharudin [1], Ahmad Rais Mohamad Mokhtar [2], Preecha Wararatchai [3], Rafeah Legino [4]

[1] Smart Manufacturing Research Institute, Faculty of Mechanical Engineering, Universiti Teknologi MARA, 40450 Shah Alam, Selangor Malaysia, [2] Faculty of Business and Management, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia, [3] College of Logistics and Supply Chain, Suan Sunandha Rajabhat University, Nakhon Pathom, Thailand, [4] Formgiving Research Group, College of Creative Art, Universiti Teknologi MARA, 40450 Shah Alam, Selangor Malaysia

rizaimy@uitm.edu.my, ahmadraismm@uitm.edu.my, preecha.wa@ssru.ac.th, rafeahl@uitm.edu.my
Tel: +6019-448 2008

Abstract
This study develops a circular supply chain management model. The review shows how CSCM promotes green supply chain management and sustainability by extending its sustainable dimension beyond the original producer. Closed-loop and open-loop supply chains are CSCM components. Using contingency theory and transaction cost theory, the CSCM model proposes that product circularity in closed-loop and open-loop supply chains affects a company's circular economy performance. This model explains CSCM's popularity in current literature, which supports the circular economy.

Keywords: Circular, Closed-loop, Open-loop, Sustainability, Supply Chain

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1.0 Introduction

Achieving economic growth and sustainable development requires the reduction of the ecological footprint by changing how firms produce and use resources. To achieve this goal, efficient management of shared natural resources and disposal of toxic waste and pollutants are critical targets. Such practices are vital to creating more efficient production and supply chains and eventually shifting inclinations toward a more resource-efficient economy. Encouraging industries, businesses, and consumers to recycle and reduce waste is equally important, as is supporting developing countries to move towards more sustainable consumption patterns.In relation to this, the United Nations Environmental Programmes (UNEP) has taken the initiative to protect the planet by introducing the seventeen Sustainable Development Goals (SDGs) Agenda for 2030. With the official start date of January 1st, 2016, the majority of countries around the world, regardless of economic status, have recognised the Global Goals. Specifically, Goal 12 of the SDGs clearly mentions the objective of responsible consumption and production. Sustainable consumption and production is about promoting resource and energy efficiency, sustainable infrastructure, providing access to basic services, green and decent jobs, and a better quality of life for all. Its implementation helps to achieve overall development plans, reduce future economic, environmental, and social costs, strengthen economic competitiveness, and reduce poverty (UN, 2019). Hence, the adoption of SDGs enables a country to achieve development targets, reduce economic, ecological, and social costs, enhance financial performance, and alleviate poverty.

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The circular economy concept entails the essential impact of eco-design, waste prevention, and product recovery on the supply chain, such as cost savings, energy conservation, waste elimination, and sustainable consumption (Kalmykova et al., 2018). As such, there is a need to focus on supply chain effectiveness in manufacturing, from producer to final consumer. This requirement resonates with the critical application of circular supply chain management (CSCM) in manufacturing operations. Unlike the closed-loop supply chain (CLSC), firms in the circular economy can collaborate with other firms in the same and different industries to maximise salvage value and zero waste. Nevertheless, it was discovered that the CSCM topic had been insufficiently discussed in the literature, as in principle, the field is still new in the domain of circular economy (Mangla et al., 2018). In Malaysia, there are no proactive efforts to recover or recycle the returns in circular environments, signifying that CSCM has not received attention from the manufacturing sector in the country (Shaharudin et al., 2017; 2019). Moreover, only 9% of plastics are recycled in the UK, and overall recycling rates have been constant at 45% since 2017. Environmentalists are concerned that a substantial portion of collected items is not recycled but instead is burned (Soufani, & Loch, 2021).

Numerous concepts, such as sustainable supply chains, green supply chains, environmental supply chains, open-loop supply chains (OLSC), and closed-loop supply chains (CLSC), have been introduced and used interchangeably in the supply chain management literature to express the integration of sustainability concepts into SCM (Gurtu et al., 2015; Ahi and Searcy, 2015). Despite the fact that these notions reflect varying degrees of integration of sustainable supply chains, most concepts lack the circular perspectives deemed necessary in the foundation of CSCM models (Farooque et al., 2019). In their study, Farooque et al. (2019) define CSCM from an extensive literature review. Through a structured examination of the literature, the study started by exploring the definition to have a thorough grasp of the state of CSCM in research today. The findings showed that the field has great potential and calls for additional research using the CSCM conceptualization, which includes restorative and regenerative processes, suitable business models (closed and open loop), and supply chain functions (reorientation) to realise a zero-waste goal in the circular economy environment. Furthermore, Batista et al. (2018) used the circular supply chain framework to analyse how well the supply chain supported the implementation of materials recovery ecosystems in the packaging sector. The study discovered that the necessity of including extra participants and processes that implement circular flows of materials makes such ecosystems more complicated than standard linear value chain systems.

Currently, the CSCM is little more than a concept, albeit a potentially powerful one (Yatim, 2018). The transition of manufacturing firms to more CSCM has yet to be implemented on a large scale. It will be a disaster if such adoption is slow, especially for developing countries such as Malaysia, with abundant waste resources that can be turned into used materials for manufacturing purposes. Furthermore, a review of the extant literature shows that a comprehensive view of CSCM is still limited in the extant literature. This prevents a clear distinction compared to other supply chain sustainability concepts and hinders further progress in the field (Farooque et al., 2019). Hence, the study aims to develop a conceptual model by providing a clear understanding of the CSCM concept and practices. The paper starts with a review of literature from the past studies, followed by the development of a conceptual model and the research propositions. The study ends with the conclusion, implication, and suggestions for future research at the end of the paper.

2.0 Literature Review

2.1 Circular Economy

The European Commission defines the transition to a circular economy as follows: "In a circular economy, the value of products and materials is preserved for as long as possible, waste and resource consumption are minimised, and resources are retained within the economy when a product reaches the end of its useful life, to be reused indefinitely to create additional value." (European Parliament, 2015). Currently, the circular economy exists widely as an idea, and the transformation to practical implementation is unavoidable, as the circular economy initiatives have been woefully inadequate. In relation to this, technologies and modelling can be used in production to leverage production through component optimisation to enhance product quality and reduce waste generation. In addition, integration among various stakeholders in the supply chain can increase the ability to maintain the production capacities in the reverse supply chains (Buyong et al., 2021), such as reverse logistics, product recovery, and remanufacturing. Such integration can pave the way for a faster transition of manufacturing into circular economy environments (Yatim, 2018).

2.2 Circular Supply Chain Management

Circular supply chain management is the application of circular perspectives to the management of the supply chain and the industrial and natural ecosystems in which it operates. It aspires to a zero-waste vision via system-wide innovation in business models and supply chain operations that span the product/service lifecycle, from design through end-of-life and waste management, including all stakeholders (Farooque et al., 2019). Significantly, there are two types of product circularity in CSCM that resemble the components of CSCM: closed-loop supply chain (CLSC) and open-loop supply chain (OLSC).

2.3 Closed-loop Supply Chain (CLSC)

CLSC is a concept that refers to the process of reconnecting the reverse supply chain to the initial forward supply chain in order to reintroduce returns into downstream production and distribution systems (Krikke, Le Blanc, & Van de Velde, 2004; Vachon, Klassen, & Johnson, 2001; Shaharudin et al., 2019). The loop does not have to be connected to the place of manufacture; instead, it can connect to any point along the forward supply chain. It refers to the final destination of items at the reverse supply chain's end, at which point businesses may choose whether to return in a loop or leave it open (Saibani, 2010). The CLSC idea comprises the concept of reclaiming end-of-use items rather than disposing of them, which has been demonstrated to increase supply chain sustainability (Geyer & Jackson, 2004). This transition transformed the businesses' traditional supply chain management into a green supply chain management model based on recycling and closed-loop logistics for material movement throughout supply networks (Basiri, Shemshadi, & Tarokh, 2011).

2.4 Open-loop Supply Chain (OLSC)

In contrast, the returns' destination in the reverse flow can also be diverted to OLSC. In most cases, CLSCs and OLSCs can be differentiated by the ability to integrate the return operations with the original operations (Kenné, Dejax, & Gharbi, 2012), which occurs in most cases of managing common reverse logistics functions. In an OLSC, the flow of products entering and exiting the supply chain occurs at two different points in a single-direction arrangement (Fleischmann, et al., 2000). Products in OLSCs are repossessed by other parties willing and capable of reusing them without having to return them to the original manufacturers (Kopicki, Legg, & Novak, 1993). For example, a recycling company in the UK, Novelis, acquired used beverage cans (UBC), which were then transformed into can body coils for resale to other can manufacturers (Stewart et al., 2018). Tetra Pak's circular supply chain mostly consists of open loops in China. Due to the fact that Tetra Pak does not recycle UBCs, recycling firms are critical to the company's circular supply chain (Batista et al., 2018). This is different from CLSCs, where products are returned to the original producers for further salvaging activities to exploit the "available" value through disposition processes such as remanufacturing and reuse activities (Fleischmann et al., 1997). Furthermore, closed and open circular supply networks comprise two types of resource flows forward-flow chains and reverse-flow chains. Forward-flowing products are common flow from producer to customers, and reverse-flowing products flow via recovery processes such as recycling, reusing, remanufacturing, and refurbishing.

2.5 Forward Supply Chains

In general, the forward supply chain deals with the movement of products from the producer to the customers (Östlin, Sundin, & Björkman, 2008). It consists of a network of interconnected facilities and supply options that purchase raw materials, converts these materials into semi- and finished products, and distribute manufactured products to customers (Basiri et al., 2011; Georgiadis & Besiou, 2009). To put it more specifically, the forward supply chain consists of a series of activities to transform the raw materials into finished products. Among other activities in the traditional forward supply chain, as indicated by Talbot et al. (2007), spanning from research and development, which include design and engineering, purchasing and production, marketing, sales, and distribution, to the post-purchase of after-sales services.

Concerning this, managing a forward supply chain requires managers to enhance the performance of several important functions such as manufacturing, purchasing, order management, and fulfilment. This can be done through improvement efforts in several ways, which include the supplier development programme and corporate customer relationship management. Besides that, several manufacturing concepts are introduced in production to increase eco-efficiency, reduce waste generation and enhance environmental performance. Among the effective strategies are cleaner production, green design, remanufacturing, and lean manufacturing (Rao & Holt, 2005). The efforts to implement these concepts may reduce the raw materials cost and increase the energy optimisation in the production phase (Jasni et al., 2021), which eventually could enhance the firm's competitiveness and performance.

2.6 Reverse Supply Chains

Reverse logistics have been widely recognised in the literature as the major component of circularity by managing product recovery, product returns, or excessive stock in the market. Reverse logistics also has become the main part of the supply chain due to its role in product circularity in the forward supply chains by reducing the waste generated through several recovery activities such as reuse, remanufacturing, and recycling (Hervani, Helms, & Sarkis, 2005). This has led to the notion that reverse logistics is imperative to green logistics, green marketing, and sustainability in the supply chain. By turning the returns into marketable products, reverse logistics support the supply chain by moving them into circulation to minimise waste throughout the process. Hence, the best approach by companies to achieve sustainability is by managing the reverse flow chain to maximise the value of product returns (Kumar & Malegeant, 2006).

Previous research has argued that reverse logistics is critical for success in many businesses (Shaharudin, 2021), even though it is frequently overlooked or underutilised. The scope of reverse logistics has now expanded from service parts management to other areas, e.g., post-service, repair, remanufacturing, etc. However, as the reverse logistics process has not been mapped under the broad scope of reverse logistics, companies find it difficult to properly plan, implement and control the process (Stock, 1998). Furthermore, most businesses established reverse logistics programmes through a non-logistics-related group or department. This situation has caused further complications that could be cumbersome to the whole process of product circularity in supply chain management.

2.7 Recovery Process

The recovery process plays an important part in managing the product returns in such a way that its absence could greatly contribute to the detrimental effects on the environment by raising the amount of waste and unprocessed product returns (Shaharudin et al., 2014). Reverse supply chains are complex operations. To overcome this, firms need to have the recovery process in at least two different rework sites (Krikke et al., 2013); repair and refurbishing centers and remanufacturing centers. The repair and refurbishing centers involved less investment, and it is human skills based to perform general refurbishing activities to replace the returns into the best possible conditions as the new products. On the other hand, remanufacturing centers are concerned with high capital investment, including technological support to produce improved remanufactured products from product returns. These rework facilities' capabilities can be located either within the factory or at the collection centers, which normally operate close to the customers.

2.8 Remarketing/Resale

Remarketing sells, moves, and stores recovered items so they can be sold to new people or used again (Kumar & Malegeant, 2006). In this context, the selling of recovered or used items may take place via a variety of different marketing channels. One channel is to offer new items in the established market, but with a distinction between new and refurbished products. Another way to get the word out is to promote to "specialty brokers." These brokers will then distribute to third parties, like stores that sell discounted goods, and also to end users (Prahinski & Kocabasoglu, 2006).

The environmental benefit is that there is reduced reliance on new resources since the lives of recovered, reused, and refurbished items may be extended. As in earlier research by Guide Jr. & Van Wassenhove (2001), there were various variables affecting the resale performance of reused items were identified, including product life expectancy, degree of innovation, design originality, consumer demand, and market worth of the products. As reconditioned items' prices might affect freshly presented products and designs on the market, certain management has expressed worry about this, particularly about the disagreements with OEM suppliers (Prahinski & Kocabasoglu, 2006).

3.0 Methodology

Generally, a literature review may be considered a more or less organised method of compiling and analysing earlier studies (Synder, 2019). In this study, an integrated literature review approach has been utilised to assess prior literature. A typical goal of an integrated review is to evaluate a research issue in a way that encourages the emergence of new theoretical frameworks and viewpoints (Torraco, 2005). The method used in this study signified the five-stage of the integrative review method (Russell, 2005), which include the conceptual problem, literature search, assessment, analysis, and model development from the interpretation results.

4.0 The Development of a Conceptual Model for Circular Supply Chain Management (CSCM)

Based on the literature review, the initial concept of CSCM is different from the linear and closed-loop supply chain model. The linear model does not implicate zero waste, whilst the closed-loop supply chain is confined to the responsibility of the original producer. In this case, CSCM enhances green supply chain management and sustainability in the supply chain management concept by intensifying its sustainable dimensions to larger participation of industries beyond the original manufacturer. Indeed, CSCM fosters new understanding and knowledge in circular economy environments.

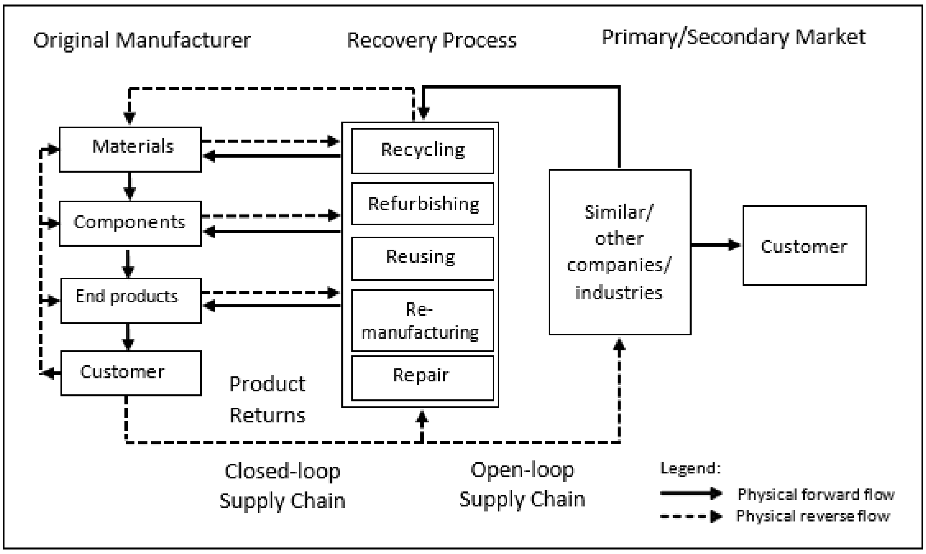

Fig. 1: Conceptual Model of CSCM

As shown in Figure 1, CSCM starts with a manufacturer's supply chain. Materials are supplied to the manufacturing process, and end products are delivered to the customer via forward flow chains. The reverse flow may consist of product returns from the three sources of product returns: customer, distribution, and manufacturing returns. In CLSC environments, product returns are transformed into new end-of-life products through recovery processes such as recycling, refurbishing, reusing, remanufacturing, or repairing. The recovery process depends on the usage, returned materials, and quality. On the other hand, in OLSC settings, unprocessed product returns are later sold or transferred to similar or other companies/industries for further recovery. Subsequently, the original manufacturer may purchase the recovered and used products from a third party. The notion of CSCM is the integration of the whole system to produce zero waste through the recovery of used materials and returns and the resale or remarketing of used products in the primary or secondary markets.

The developed CSCM conceptual model can be explained using contingency theory and transaction cost theory (Lahti et al., 2018).

The rationale of contingency theory underpins the adoption of a circular economy in the supply chain to reposition the organisation by implementing changes to meet environmental requirements on an internal and external contextual basis. This is imperative since sustainability deprivation is exacerbated far more by the damage to social and economic conditions due to environmental degradation (OECD, 2020). In this context, the environmental directions of the companies are intended to increase the value of the existing resources and realignments the new resources (Kortmann & Piller, 2016). Hence, the companies' extent of bundling the resources and improving internal resources is contingent upon the environmental requirements such as institutional, stakeholders, and market demand (Shaharudin et al., 2019).

Furthermore, the transaction cost theory intertwines between the circularity of products and the collaborations among the network partners in the supply chain (Lahti et al., 2018). With solid cooperation among partners, the companies can face the pressures of environmental requirements in the supply chain. The extent to which companies can deal with the reverse supply chain transactions, including the basic contractual terms and cost, can eventually determine the success of the value-adding activities in adopting CSCM. Hence, companies need to comprehend the whole supply chain, including the linear and reverse supply chains, when implementing circular principles in their supply chain management. As such, the preceding discussions strongly suggest that CSCM adoption is related to the circular economy principles. Thus, this leads to the following proposition:

Proposition: CSCM adoption significantly affects the company's circular economy performance.

5.0 Discussion

Specifically, the study found several significant elements of CSCM support the circular economy philosophy. The inclusion of products in closed-loops and open-loops from both forward and reverse supply chains, supported by the recovery process, and finally, resale or remarketing of used products in the primary or secondary market, can successfully implement the shift towards a circular economy. Such integrative approaches with diverse circulating flows in the supply chain enable a sustainable product recovery process (Batista et al., 2018). Hence, the study signified the supply chain's critical role in product recovery in circular economy settings.

The CSCM conceptual model developed in this study prevailed over the CLSC and OLSC circularity of products, with the used products ending up in two different destinations: the original manufacturer or different companies/industries. Such circumstances occur depending upon the ability of the original manufacturer to conduct the recovery of used products in the reverse flow chains. From a circular economy perspective, adopting circular flows for the main products can add more complexity and enlarge the process of supply chain operations (Govindan & Hasanagic, 2018). The original manufacturer can have three choices for the restorative and regenerative processes in CSCM: either conduct the recovery internally, to sell the used product to the third party, or purchase the recovered products from the third party. Each process supports the notion of product circularity within the sustainable ecosystem by eliminating waste in the supply chain.

From a practical viewpoint, the CSCM model supported the complementary process, particularly in obtaining the returns from the CLSC and OLSC. In order to effectively manage reverse logistics operations, manufacturers can benefit from an additional source of returns from both flow chains. Significantly, the returns uncertainties such as timing, volume, and quality (Shaharudin et al., 2019) can be mitigated by considering the suitable strategies of the CSCM with the choices of the used products from their own brand and other brands, including those of the competitors' products. Manufacturers can acquire many used products with eco-friendly characteristics from different brands in the reverse flow chain as a potential source of recovered materials in the production with sustainable product design development (Cooper-Ordoez et al., 2018).

The study outcome supports the contention of contingency and transaction cost theory. Both theories embrace the principles of circularity in the supply chain by repositioning the company into a recovery package strategy and absorbing the basic contractual terms and costs with the partners to achieve higher added value in the CSCM implementation. The recovery package is termed "build back better", which refers to the reduction of carbon emission goals, climate change impacts, lessening harm to biodiversity, and enhancement of CSCM (OECD, 2020).

6.0 Conclusion

This study addresses the issue of CSCM as the utmost concept in the sustainability of supply chains, which are expected to benefit the firm and society. In this case, the study proposed a developed CSCM model for a better and more precise explanation of the linkage between sustainability and circular economy principles. The model advanced the understanding of broad coverage of product return circularity, with both CLSC and OLSC being the significant components in CSCM. Both components support the notion of industry-limited adoption, especially on the part of the CLSC component, which means not all products can be diverted back to the original manufacturer. The model clarified the CSCM adoption from the past studies and is expected to contribute by providing new practises under the CSCM concept in the existing literature. In practical contribution, the CSCM adoption is aligned with Goal 12 under the UNEP SDG2030 initiatives to promote sustainable consumption and production patterns. Hence, this study promotes the adoption of CSCM to improve sustainability practises in line with the Malaysian government's efforts to achieve SDGs by 2030. The developed conceptual model lays the groundwork for future research on any aspect of CSCM because there is very little information and literature discussing the CSCM model.

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References

Ahi, P., & Searcy, C. (2015). Assessing sustainability in the supply chain: A triple bottom line approach. Applied Mathematical Modelling, 39(10), 2882-2896.

Basiri, A. H., Shemshadi, A., & Tarokh, M. J. (2011). A Closed-Loop Logistics Model for Green Supply Chain Management. International Journal of Applied Logistics, 2(3), 1–15.

Batista, L., Gong, Y., Pereira, S., Jia, F., & Bittar, A. (2018). Circular supply chains in emerging economies – a comparative study of packaging recovery ecosystems in China and Brazil. International Journal of Production Research, 57(23), 7248-7268.

Buyong, S. Z., Syed Marzuki, S. Z., Junid, J., & Abdul Kadir, M. A. B. (2021). Eco Business Practices Among Malaysian Green Technology Companies Towards Expected Business Benefits. Environment-Behaviour Proceedings Journal, 6(17), 25-32.

Cooper-Ordoñez R.E., Altimiras-Martin A., Filho W.L. (2019) Environmental Friendly Products and Sustainable Development. In: Leal Filho W. (eds) Encyclopedia of Sustainability in Higher Education. Springer, Cham. https://doi.org/10.1007/978-3-319-63951-2_131-1

European Parliament (2015). Circular economy: definition, importance and benefits. News European Parliament. Retrieved from https://www.europarl.europa.eu/news/en/headlines/economy/20151201STO05603/circular-economy-definition-importance-and-benefits

Farooque, M. Zhang, A., Thürer, M., Qu, T., & Huisingh, D. (2019). Circular Supply Chain Management: A Definition and Structured Literature Review. Journal of Cleaner Production, 228, 882-900.

Fleischmann, M., Bloemhof-Ruwaard, J. M., Dekker, R., van der Laan, E., van Nunen, J. A. E. E., & Van Wassenhove, L. N. (1997). Quantitative models for reverse logistics: A review. European Journal of Operational Research, 103(1), 1–17.

Fleischmann, M., Krikke, H. R., Dekker, R., & Flapper, S. D. P. (2000). A characterisation of logistics networks for product recovery. Omega, 28(6), 653-666.

Georgiadis, P., & Besiou, M. (2009). Environmental Strategies for Electrical and Electronic Equipment Supply Chains: Which to Choose? Sustainability, 1(3), 722-733.

Geyer, R., & Jackson, T. (2004). Supply loops and their constraints: The industrial ecology of recycling and reuse. California Management Review, 46(2), 55-73.

Guide Jr., V. D. R., & Van Wassenhove, L. N. (2001). Managing product returns for remanufacturing. Production and Operations Management, 10(2), 142-155.

Gurtu, A., Searcy, C., & Jaber, M. Y. (2015). An analysis of keywords used in the literature on green supply chain management. Management Research Review, 38(2), 166-194.

Hervani, A. A., Helms, M. M., & Sarkis, J. (2005). Performance measurement for green supply chain management. Benchmarking: An International Journal, 12(4), 330-353.

Jasni, N. S., Yusoff, H., & Wibowo, P. (2021). Internal Business Factors for Business Sustainability: A Realistic View from Sustainability Managers. Environment-Behaviour Proceedings Journal, 6(18), 3-8.

Kalmykova, Y., Sadagopan, M., & Rosado, L. (2018). Circular economy – From review of theories and practices to development of implementation tools. Resources, Conservation and Recycling, 135, 190-201.

Kenné, J. –P. & Dejax, P., & Gharbi, A. (2012). Production planning of a hybrid manufacturing–remanufacturing system under uncertainty within a closed-loop supply chain. International Journal of Production Economics, 135(1), 81-93.

Kortmann, S., & Piller, F. (2016). Open Business Models and Closed-Loop Value Chains: Redefining the Firm-Consumer Relationship. California Management Review, 58(3), 88-108.

Krikke, H., Le Blanc, I., & Van de Velde, S. (2004). Product modularity and the design of closed-loop supply chains. California Management Review, 46(2), 23–39.

Krikke, H., Hofenk, D., & Wang, Y. (2013). Revealing an invisible giant: A comprehensive survey into return practices within original (closed-loop) supply chains. Resources, Conservation and Recycling, 73(2013), 239–250.

Kopicki, R. J., Legg, L. L., & Novak, K. E. (1993). Reuse and recycling: reverse logistics opportunities. Annual Conference Proceedings, Council of Logistics Management, pp. 29-36.

Kumar, S., & Malegeant, P. (2006). Strategic alliance in a closed-loop supply chain, a case of manufacturer and eco-non-profit organisation. Technovation, 26(10), 1127–1135.

Mangla, S. K., Luthra, S., Mishra, N., Singh, A., Rana, N. P., Dora, M., & Dwivedi, Y. (2018). Barriers to effective circular supply chain management in a developing country context. Production Planning & Control, 29(6), 551-569.

OECD (2020). Building back better: A sustainable, resilient recovery after COVID-19. OECD Policy Responses to Coronavirus (COVID-19). Retrieved from https://www.oecd.org/coronavirus/policy-responses/building-back-better-a-sustainable-resilient-recovery-after-covid-19-52b869f5/

Östlin, J., Sundin, E., & Björkman, M. (2008). Importance of Closed Loop Supply Chain Relationships for Product Remanufacturing. International Journal of Production Economics, 115(2), 336-348.

Prahinski, C., & Kocabasoglu, C. (2006). Empirical research opportunities in reverse supply chains. Omega, 34(6), 519–532.

Rao, P., & Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance? International Journal of Operations & Production Management, 25(9), 898–916.

Russell, C. L. (2005). An Overview of the Integrative Research Review. Progress in Transplantation, 15(1), 8-13.

Saibani, N. (2010). Performance Measurement for Reverse and Closed-loop Supply Chains. Unpublished Thesis, University of Nottingham.

Shaharudin, M.R. (2021). The Role of Transport in Reverse Distribution Chains. The Open Transportation Journal, 15(1), 256-259.

Shaharudin, M. R., Tan, K. C., Kannan, V., & Zailani, S. (2019). The mediating effects of product returns on the relationship between green capabilities and closed-loop supply chain adoption. Journal of Cleaner Production, 211, 233–246.

Shaharudin, M. R., Govindan, K., Zailani, S., Tan, K. C., & Iranmanesh, M. (2017). Product return management: Linking product returns, closed-loop supply chain activities and the effectiveness of the reverse supply chains. Journal of Cleaner Production, 149, 1144-1156.

Shaharudin, M. R., Zailani, S., & Tan, K. C., 2014. Barriers to product returns and recovery management in a developing country: investigation using multiple methods. Journal of Cleaner Production, 96, 220-232.

Soufani, K., & Loch, C. (2021). Circular Supply Chains Are More Sustainable. Why Are They So Rare? Harvard Business Review. Retrieved from https://hbr.org/2021/06/circular-supply-chains-are-more-sustainable-why-are-they-so-rare.

Stewart, R., Niero, M., Murdock, K., & Olsen, S. I. (2018). Exploring the Implementation of a Circular Economy Strategy: The Case of a Closed-loop Supply of Aluminum Beverage. Procedia CIRP. 69(1). 810-815.

Stock, J. R. (1998). Development and implementation of reverse logistics programs. Oak Brook, IL: Council of Logistics Management.

Snyder H. (2019). Literature review as a research methodology: An overview and guidelines, Journal of Business Research, 104, 333-339.

Talbot, S., Lefebvre, É., & Lefebvre, L.-A. (2007). Closed-loop supply chain activities and derived benefits in manufacturing SMEs. Journal of Manufacturing Technology Management, 18(6), 627–658.

Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. Human Resource Development Review, 4(3), 356-367.

UN (2019). The Sustainable Development Agenda. Retrived from https://www.un.org/sustainabledevelopment/development-agenda/

Vachon, S., Klassen, R. D., & Johnson, P. F. (2001). Customers as green suppliers: Managing the complexity of the reverse supply chain. In Sarkis, J. (Ed.) Greener Manufacturing and Operations: From Design to Delivery and Back (pp. 136–149). Sheffield: Greenleaf Publishing.

Yatim (2018). Circular economy for sustainable development. The New Straits Times. Retrieved from https://www.nst.com.my/opinion/columnists/2018/02/332848/circular-economy-sustainable-development