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Relationship among Reverse Logistics, Corporate Image and Social Impact in Medical Device Industry

Shu-Quan HONG[1], Yue-Jun, HUANG[2]

Abstract

Along with rising awareness of social welfare and environmental protection, corporate social responsibility becomes an internationally emphasized topic. The implementation of corporate social responsibility could effectively promote social impact and brand value as well as present the competitiveness of long-term competitive advantage and sustainable management. From the aspect of environmental protection, medical products with use value should not be disposed in the recovery channel. In this case, the maintenance of medical products and the activity to maintain waste medical products, recycle resources, and reuse parts are the environmental protection issues stressed by the government and the public. Aiming at the mass society in Fujian Province, total 360 copies of questionnaire are distributed, with random sampling, and 274 valid copies are retrieved, with the retrieval rate 76%. The retrieved data are analyzed with statistics software. The research results show significant correlations between reverse logistics and corporate image, corporate image and social impact, as well as reverse logistics and social impact. Suggestions, according to the results, are proposed, expecting to help medical device industry effectively combine green strategies, include the concept of environmental protection into corporate culture, provide the society with valuable goods or services, master green business opportunities, and precede differentiation competition in the same trade in order to win in the fierce competition.

Keywords: medical device industry, reverse logistics, corporate image, social impact, social responsibility.

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Introduction

Image is the intangible asset of an enterprise. Corporate image is the overall feeling, impression, and cognition about an enterprise, the comprehensive reflection of the status, and the overall impression established after the public comprehensive cognition of the enterprise. Current competition among enterprises could be the competition of image. An enterprise with good image could more easily be trusted by consumers. In other words, a company receiving consumers' trust and good impression would be more easily present good social impact. However, consumers would not blindly accept all messages delivered from enterprises and follow the messages to have behaviors and make decisions, but would filter messages to appear successive behavioral responses. Along with rising awareness of social welfare and environmental protection, social impact becomes an internationally emphasized topic. The implementation of corporate social responsibility could effectively promote social impact and brand value and present the competitiveness of long-term competitive advantage and sustainable management. Risks are disasters, but could create related economic benefits. Similar to the issues of greenhouse effect and energy crises discovered by people, environmental protection issue are emphasized in the world, and relevant recycle regulations are made internationally to enhance enterprises more positively participating in reverse logistics. To balance economy and environmental protection, the effective use of energy and resource recycling are concerned in the world, and environmental protection regulations are made to supervise businesses providing environmental protection products and taking responsibility for effectively dealing with waste products and recovery. In fact, the role of corporate reverse logistics in the entire logistics activity could complement the process of forward logistics. For instance, the introduction of material substitution and the use of reclaimed materials could reduce waste in the manufacturing process; reinforcing the efficiency of a company dealing with returned products could enhance customer satisfaction; applying object reuse and processing, extending the life cycle of objects, enhancing the use efficiency of objects, and doing well of waste cleaning could reduce processing costs of enterprises as well as reduce the damage on the environment. On the other hand, large amount of waste exists in the supply chain system of production, circulation, and consumption, along with constant economic growth, to seriously endanger the natural ecological environment on the earth. Along with strengthening environmental protection awareness of the mass society and the constraints of international environmental protection regulations, the society enhances the emphasis on reverse logistics to have the concept of corporate reverse logistics management be broadly concerned in the society. The impacts from product return, material substitution, material reuse, waste processing, reprocessing, maintenance, and reproduction on the environment should be taken into account to form the green supply chain. To fulfill the goal of sustainable development, the environmental

burden must be stabilized or reduced. Greening could be a long-term development strategy of an enterprise, as well as a long-term investment.

The development of technology and the constant progress of medicine have high-quality and new-function medical devices be developed. Nevertheless, the short life cycle of products result in the rapid renewal of products. Advanced countries are facing large quantity of waste after the largely increasing information products. Most recycled waste or the parts could be reused in the production that domestic government and the public gradually stress on the reuse of medical waste. From the aspect of environmental protection, medical products with use value should not be disposed in recovery channels. For this reason, the maintenance of medical products and the maintenance, resource reuse, and parts reuse of waste medical products are the environmental protection issues emphasized by the government and the public. In the discussion of the relationship among reverse logistics, corporate image, and social impact in medical device industry, this study expects to help medical device industry break through traditional thinking models and effectively combine green strategies to achieve the new business model with balanced economy, environment, and society. Including the concept of environmental protection into corporate culture to provide valuable goods or services for the society, mastering green business opportunities, and preceding differentiation competition from the same trade would win in the fierce competition.

Literature review

Chen *et al.* (2020) defined reverse logistics as the goods moving process from the end destination to other places, mainly for acquiring the value which could not be acquire from other aspects or proper treatment of products. Long *et al.* (2019) defined reverse logistics as product return, source reduction, regeneration, material substitution, object reuse, waste cleaning, retreatment, maintenance, and reproduction in the logistics. From the viewpoint of engineering logistics, it was revealed as reverse logistics management, a systematic business model applying the optimal logistics engineering and management methods in the enterprise to complete the circulation of supply chain and make profits. Ho, Huang, & Hsu (2018) pointed out reverse logistics as the process of an enterprise, through regeneration, reuse, and material reduction, efficiently achieving environmental protection. The narrow definition of reverse logistics was considered as the process of reusing, regenerating, reprocessing waste products and material recycling of sold products in the distribution network system. In addition to the narrow definition of reverse logistics, the broad definition also covered the reduction of materials used in positive supply chain so that the recycled material quantity was decreased and products could be more conveniently reused and regenerated. Guo *et al.* (2018) proposed that most research focused on environmental protection. Reverse logistics referred to maintaining, recovering and sorting, reusing, remanufacturing,

and scrapping returned products, i.e. the activity or route of recovering and treating product materials for the product being resold on the market. Shen *et al.* (2019) indicated that, along with globally emerging environmental awareness and mandatory acts in European and American countries, enterprises stressed more on reverse logistics and regarded reverse logistics as important as forward logistics to further integrate forward logistics and reverse logistics. Jian, Xu, & Zhou (2019) mentioned that the introduction of reverse logistics into enterprises could reduce damage to the environment and enhance corporate image. Accordingly, the following hypothesis is proposed in this study.

H1: Reverse logistics presents significant correlations with corporate image.

Ding, Chen, & Wang (2020) regarded image as personal subjective perception, rather than aiming at the true content of an event, as people were not completely guided the actions by knowledge and information, but would act according to the perceived result. Image was individual perceived result that it presented subjectivity and was responded based on personal point of view and acquired limited information. Zhang & He (2019) defined corporate image that consumers often described the characteristics of an enterprise with personified adjectives, such as reliable, reputable, friendly, and bad. The sum of such personality traits formed the so-called corporate image. Sun, Liu, & Zhao (2019) mentioned that factors in corporate image might be the overall impression of customers perceiving the entity and behavior of an enterprise, including the name, tradition, business philosophy, and service of the enterprise, as well as the mutual effect of customers' overall experience, feeling, ideas, and knowledge about the enterprise. Dost *et al.* (2019) explained corporate image as the interaction of consumers' experience, ideas, feeling, belief, and knowledge about an enterprise. Wang *et al.* (2019) regarded corporate image as consumers' emotion or impression about activities engaged by an enterprise; such perception presented individual subjectivity. Tseng *et al.* (2019) pointed out corporate image as the belief, emotion, or impression of consumers generated through the understanding, description, and memory of an enterprise. Xue *et al.* (2021) stated that, in addition to legal regulations and economic operation, an enterprise had to consider the effect of corporate image on social impact when making decisions with moral and ethical factors; and, an enterprise was obligated to make prosocial decisions and assist in solving social problems. Difrancesco, Huchzermeier, & Schröder (2018) mentioned that corporate action should seriously consider the effect of corporate image on social impact, and the obligation of an enterprise was to pursue all activities conforming to social value and satisfying the society. Qu *et al.* (2019) indicated that corporate image could maintain the competitive advantage of a company as well as establish positive social impact. Karaman & Akman (2018) pointed out the external effect of corporate image on organizational reputation to build positive social impact in front of suppliers, investors, and consumers. Govindan *et al.* (2019) stated that the mass society would perceive good corporate image of an enterprise investing the

surplus in some charitable events and consider the clean and upright image of the enterprise. For this reason, an enterprise permanently and continuously investing in resources for charity could enhance the reputation and image. In comparison with other enterprises, an enterprise fulfilling social responsibility would have better opportunities to shape social impact. Dou *et al.* (2019) considered that an enterprise engaging in social responsibility and delivering information to consumers would enhance consumers' perceived corporate image to further promote social impact to affect consumers' behavior and decisions. Accordingly, the following hypothesis is proposed in this study.

H2: Corporate image shows remarkable correlations with social impact.

Guo *et al.* (2020) regarded social impact as a leader's thinking and behavior devoting to social welfare or specific social problems to contribute to the positive, meaningful, and continuous change; social impact was not simply generated by a person, but also enterprises, government, society-targeted organizations, and intellectuals. Hong, Wang, & Yu (2018) regarded social impact as a metatheory, i.e. description of mutual influence among individuals under limited time and space; more importantly, the effect was enhanced through the intensity, immediate action, and number of people in the social environment. Social impact theory concerned about the effect of an individual, several individuals, to the entire group on individuals as well as individual social process operation in certain period. Sennaroglu & Celebi (2018) considered that an organization with social impact would positively, meaningfully, and continuously change the behavior for devoting to social or environmental problems in order to change the attitudes of consumers, investors, suppliers, and employees towards the organization. Sellitto (2018) indicated that, along with constantly growing economy, a large amount of waste existed in the supply chain system of production, circulation, and consumption to serious endanger the natural ecological environment on the earth. The strengthening environmental awareness of the mass society and the constraint of international environmental regulations enhanced social emphasis on reverse logistics. The concept of corporate reverse logistics was then broadly concerned in the society. The process from product return, material substitution, article reuse, waste treatment, retreatment, maintenance, and remanufacturing should take the impact on the environment into account for forming the green supply chain and fulfilling corporate social responsibility to promote corporate social impact. Fraccascia, Giannoccaro, & Albino (2018) indicated that an enterprise was a member of the society and the adoption of reverse logistics would affect the environment. Few enterprises would not particularly stress on costs in the development of environmental plans; however, more enterprises tended to spend the least after fulfilling social responsibility, as it would influence the profits and social impact of enterprises. Zhang *et al.* (2020) stated that, since reverse logistics related activities would impact the environment, the adoption of reverse logistics could be regarded as the effort of an enterprise to social responsibility,

because the coverage and application of reverse logistics would positively affect the environment; an enterprise could therefore enhance the social impact. Liu, Chen, & Diallo (2018) regarded reverse logistics as a core plan of an enterprise that an enterprise had to emphasize reverse logistics management and devote to the development of green supply chain in order to match customers' requirement for environmental products and reduce the impact on the entire social environment down to the lowest as well as to fulfill corporate social responsibility for promoting corporate social impact. As a result, the following hypothesis is proposed in this study.

H3: Reverse logistics reveals notable correlations with social impact.

Methodology

Operational definition

Reverse logistics: Referring to He & Yuan (2020), reverse logistics in this study is divided into three dimensions.

a) Cost benefit: When making decisions for reverse logistics, the cost and benefit are the major considerations of an enterprise.
b) Legal requirement: In the industrialized world, environmental legislations of the government could effectively promote corporate responsibility for the life cycle of the produced products. Customers' concern about global climate warming, greenhouse effect, and environment pollution deepens the trend.
c) Environmental impact: An enterprise is a member of the society that the adoption of reverse logistics would affect the environment. Reverse logistics related activities would impact the environment, as the coverage and application would positively affect the environment.

Corporate image: Referring to Huang, Fang, & Lin (2020), perfect corporate image is established on three mutually correlated dimensions, which should be simultaneously improved and mutually supported.

a) Economic aspect: pursuit of profits (products, service, management, innovation).
b) Social aspect: sharing social responsibility (environmental protection, public welfare).
c) Human: aspect satisfying employees and consumers. Such three aspects must be simultaneously improved and mutually supported.

Social impact: Referring to Huang, Fang, & Lin (2020), social impact is established on three dimensions in this study.

a) Corporate commitment: commitment to consumers, cultivation and care about employees, and involvement in social responsibility.

b) Environmental protection: An enterprise presents specific goals and measures on environmental protection and energy saving.
c) Social participation: An enterprise permanently involves in specific social issues and develops positive influence.

Method and model

The goodness-of-fit test of LISREL model could be measured from overall model fit (i.e. external quality of model) and internal quality of model. In terms of overall model fit test, the most commonly used fit indices contain (1)"$\chi 2$ ratio" (Chi-Square ratio), standing for the gap between actual theoretical model and expected value, which is better smaller than 3, (2)goodness of fit index (GFI) and adjusted goodness of fit index (AGFI), which reveal the better fit when close to 1, (3)root mean square residual (RMR), reflecting "fit residual variance/covariance mean", which is better smaller than 0.05, and (4)incremental fit index (IFI), which reveals good model fit when higher than 0.9.

The indices for the internal quality of model commonly used for LISREL include (1)square multiple correlation (SMC) of individual manifest variable, i.e. R2 of manifest variable and latent variable, which should be higher than 0.5, (2)component reliability of latent variable (ρ), as the Cronbach's α of observed indices of latent variable, which should be higher than 0.6, and (3)average variance extracted of latent variable, which is calculated by dividing R2 sum of manifest variables of a latent variable by the number of manifest variables to show the percentage of latent variable being measured with manifest variables, which is better higher than 0.5.

Research sample

Aiming at the mass society in Fujian Province, total 360 copies of questionnaire are distributed, with random sampling, and 274 valid copies are retrieved, with the retrieval rate 76%. The retrieved questionnaire data are analyzed with statistics software.

Reliability and validity test

Validity refers to a measurement scale being able to actually measure what a researcher intends to measure. Common validity contains "content validity", tending to qualitative verification, "criterion validity", using the known external criterion and correlation coefficient of the test for the evaluation, and "construct validity", used for evaluating the theoretical consistency of the measurement to other observable variables. The questionnaire content is based on past theories and referred to the real situation of research subjects to design the measuring tool which could express the essence of affairs and complete representativeness, in order to

ensure the questionnaire conforming to content validity. The final communality estimate of the factor analysis result is applied to test the construct validity, and the validity appears in 0.8~0.9, showing good validity test result of this questionnaire.

Results

Model fit test

The estimation with "maximum likelihood method" is used in this study, and the analysis result achieves the convergence. Overall speaking, the overall model fit indices in this study pass the test, fully reflecting good external quality of the model.

Table 1. Model analysis result

	index	judgment standard	result
overall fit	*p* -value	*p* -value > 0.05	0.000
	χ_2/d.f.	< 3	1.634
	GFI	> 0.9	0.977
	AGFI	> 0.9	0.924
	CFI	> 0.9	0.958
	RMR	< 0.05, < 0.025 excellent	0.021
	RMSEA	0.05~0.08 good < 0.05 excellent	0.028
	NFI	> 0.9	0.936
	IFI	> 0.9	0.926

Path relation test

Regarding the test of internal quality of mode, SMC of manifest variables is higher than 0.5 (Tables 2 & 3), showing good indices of latent variables. Furthermore, the component reliability of latent variables, namely reverse logistics, corporate image, and social impact, is higher than 0.6, and the average variance extracted is higher than 0.5 (Table 4), apparently conforming to the test requirement for internal quality of model.

Table 2. SMC of variable to dimension

reverse logistics		
cost benefit	legal requirement	environmental impact
0.71	0.78	0.86

Table 3. SMC of variable to dimension

corporate image			social impact		
Economic aspect	Social aspect	Human aspect	Corporate commitment	Environmental protection	Social participation:
0.75	0.77	0.81	0.82	0.83	0.88

Table 4. Component reliability and average variance extracted of variable

item	reverse logistics	corporate image	social impact
component reliability	0.856	0.847	0.886
average variance extracted	0.84	0.82	0.87

The model analysis result, *Table 5*, reveals positive and significant correlations between reverse logistics and corporate image (0.869), corporate image and social impact (0.883), and reverse logistics and social impact (0.857) that H1, H2, and H3 are supported. The research hypothesis test results are shown in *Table 6*.

Table 5. Linear structural model analysis result

evaluation item	parameter/evaluation standard	result	t
internal fit	reverse logistics→corporate image	0.869	25.77**
	corporate image →social impact	0.883	34.12**
	reverse logistics→social impact	0.857	21.36**

Table 6. Hypothesis test

research hypothesis	correlation	empirical result	P	result
H1	+	0.869	0.00	supported
H2	+	0.883	0.00	supported
H3	+	0.857	0.00	supported

Discussion

Due to the greenhouse effect and energy crises, environmental protection issues have raised lots of universal attention in the past few years. In the competitive medical device industry, personalized consumption and diversified demand facilitate medical device companies to launch innovative products. It will shorten the product life circle and gradually increase the number of products returned. In the medical device industry, the companies that implement reverse logistics management contribute to improving their corporate image. It also has an impact on perspective towards that specific company and could enhance social influence. Medical device companies could do their corporate social responsibilities through reverse logistics activities to improve their corporate image and social influence. In the meantime, using the concept of cradle-to-cradle (C2C) while doing product design and development would consider green production and outline the whole process of the supply chain. It means a lot for both the medical device industry and the society as a whole since it affects consumers' point of view towards suppliers and their brand loyalty. Therefore, implementing reverse logistics management would bring substantial benefits to the medical device industry.

Conclusion

The research results show remarkably positive effects of the implementation of reverse logistics management in medical device industry on social impact, revealing that medical device industry should get rid of traditional old thinking, consider the effect, with the thinking of sustainable development, on the society and the natural environment, include the concept of environmental protection into medical device industry, reinforce companies in medical device industry executing reverse logistics management, reduce damage on the environment to enhance environmental performance, and minimize waste. It would promote competitive advantage and establish good social impact of medical device industry to achieve the vision of sustainable development. An enterprise fulfilling corporate social responsibility would appear notably positive effects on corporate image. It reveals that medical device industry, in the business activity, should not regard profit-making as the sole object, but should consider the effect, under moral and ethical factors, on the society, and positively invest in the responsibility for improving social environment. In addition to assisting in the development of medical device industry, it could present good social impact on the mind of the mass society. Finally, the implementation of reverse logistics in medical device industry could significantly and positively affect corporate image. Apparently, the introduction of reverse logistics management into medical device industry allows timely recycling and treating or reusing used products, reducing impacts on the environment, and facilitating green design and manufacturing. It could promote self-image and

reputation of medical device industry as well as become a competitive advantage to achieve the vision of sustainable development. Apparently, the practice of reverse logistics management presents actual benefits on enterprises.

Recommendations

According to the research results and findings, the following practical suggestions are proposed in this study.

a) The social responsibility of medical device industry indeed could promote good image of enterprises and affect consumers' attitude towards medical device industry. For this reason, medical device industry should not take profit making as the objective. Under the thinking of sustainable development, medical device industry should not simply pursue profits, but should get into communities, participate in society, and help the disadvantaged. It does not simply do good things, but also develops social impact, enhances social development, and implements corporate social responsibility to become good corporate citizens.
b) It is suggested that medical device industry should promote reverse logistics engaged in the enterprise for consumers understanding the practice of reverse logistics. In this case, it would help the society and enhance the image and social impact.
c) It is suggested that medical device industry could donate recycled, reassembled, and reproduced products to disadvantaged groups to present the kind behavior. In this case, the engagement in reverse logistics management in medical device industry would greatly help the environment and promote the social impact through the fulfillment of social responsibility.

References

Chen, D., Ignatius, J., Sun, D., Goh, M., & Zhan, S. (2020). Pricing and equity in cross-regional green supply chains. *European Journal of Operational Research*, *280*(3), 970-987. DOI: 10.1016/j.ejor.2019.07.059.

Difrancesco, R.M., Huchzermeier, A., & Schröder, D. (2018). Optimizing the return window for online fashion retailers with closed-loop refurbishment. *Omega*, *78*, 205-221. DOI: 10.1016/j.omega.2017.07.001.

Ding, J., Chen, W., & Wang, W. (2020). Production and carbon emission reduction decisions for remanufacturing firms under carbon tax and take-back legislation. *Computers & Industrial Engineering*, *143*, 106419. DOI:10.1016/j.cie.2020.106419.

Dost, M., Pahi, M.H., Magsi, H.B., & Umrani, W.A. (2019). Influence of the best practices of environmental management on green product development. *Journal of Environmental Management*, *241*, 219-225. DOI: 10.1016/j.jenvman.2019.04.006.

Dou, G., Guo, H., Zhang, Q., & Li, X. (2019). A two-period carbon tax regulation for manufacturing and remanufacturing production planning. *Computers & Industrial Engineering*, DOI: *128*, 502-513. 10.1016/j.cie.2018.12.064.

Fraccascia, L., Giannoccaro, I., & Albino, V. (2018). Green product development: What does the country product space imply? *Journal of Cleaner Production*, *170*, 1076-1088. DOI: 10.1016/j.jclepro.2017.09.190.

Govindan, K., Kadziński, M., Ehling, R., & Miebs, G. (2019). Selection of a sustainable third-party reverse logistics provider based on the robustness analysis of an outranking graph kernel conducted with ELECTRE I and SMAA. *Omega*, *85*, 1-15. DOI: 10.1016/j.omega.2018.05.00.7

Guo, L., Qu, Y., Tseng, M.-L., Wu, C., & Wang, X. (2018). Two-echelon reverse supply chain in collecting waste electrical and electronic equipment: A game theory model. *Computers & Industrial Engineering*, *126*, 187-195. DOI: 10.1016/j.cie.2018.09.036.

Guo, R., Lv, S., Liao, T., Xi, F., Zhang, J., Zuo, X., Zhang, Y. (2020). Classifying green technologies for sustainable innovation and investment. *Resources, Conservation and Recycling*, *153*, 104580. DOI: 10.1016/j.resconrec.2019.104580.

He, L., & Yuan, H. (2020). Investigation of construction waste recycling decisions by considering consumers' quality perceptions. *Journal of Cleaner Production*, 259, 120928. DOI: 10.1016/j.jclepro.2020.120928.

Ho, J.-W., Huang, Y.-S., & Hsu, C.-L. (2018). Pricing under internal and external competition for remanufacturing firms with green consumers. *Journal of Cleaner Production, 202*, 150-159. DOI: 10.1016/j.jclepro.2018.08.109.

Hong, Z., Wang, H., & Yu, Y. (2018). Green product pricing with non-green product reference. *Transportation Research Part E: Logistics and Transportation Review*, *115*, 1-15.

Huang, Y.-S., Fang, C.-C., & Lin, Y.-A. (2020). Inventory management in supply chains with consideration of Logistics, green investment and different carbon emissions policies. *Computers & Industrial Engineering*, *139*, 106207. DOI: 10.1016/j.cie.2019.106207.

Jian, H., Xu, M., & Zhou, L. (2019). Collaborative collection effort strategies based on the "Internet + recycling" business model. *Journal of Cleaner Production*, *241*, 118120. DOI:10.1016/j.jclepro.2019.118120.

Karaman, A. S., & Akman, E. (2018). Taking-off corporate social responsibility programs: An AHP application in airline industry. *Journal of Air Transport Management*, *68*, 187-197. DOI: 10.1016/j.jairtraman.2017.06.012.

Liu, Z., Chen, J., & Diallo, C. (2018). Optimal production and pricing strategies for a remanufacturing firm. International Journal of Production Economics, 204, 290-315. DOI: 10.1016/j.ijpe.2018.07.015.

Long, X., Ge, J., Shu, T., & Liu, Y. (2019). Analysis for recycling and remanufacturing strategies in a supply chain considering consumers'

heterogeneous WTP. Resources, Conservation and Recycling, 148, 80-90. DOI: 10.1016/j.resconrec.2019.05.001

Qu, S., Zhou, Y., Zhang, Y., Wahab, M.I.M., Zhang, G., & Ye, Y. (2019). Optimal strategy for a green supply chain considering shipping policy and default risk. *Computers & Industrial Engineering*, *131*, 172-186. DOI: 10.1016/j.cie.2019.03.042

Sellitto, M.A. (2018). Reverse logistics activities in three companies of the process industry. *Journal of Cleaner Production*, *187*, 923-931. DOI: 10.1016/j.jclepro.2018.03.262.

Sennaroglu, B., & Celebi, G.V. (2018). A military airport location selection by AHP integrated PROMETHEE and VIKOR methods. *Transportation Research Part D: Transport and Environment*, *59*, 160-173. DOI: 10.1016/j.trd.2017.12.022.

Shen, B., Liu, S., Zhang, T., & Choi, T.-M. (2019). Optimal advertising and pricing for new green products in the circular economy. *Journal of Cleaner Production*, *233*, 314-327. DOI: 10.1016/j.jclepro.2019.06.022.

Sun, Y., Liu, N., & Zhao, M. (2019). Factors and mechanisms affecting green consumption in China: A multilevel analysis. *Journal of Cleaner Production*, *209*, 481-493. DOI: 10.1016/j.jclepro.2018.10.241.

Tseng, M.-L., Islam, M.S., Karia, N., Fauzi, F.A., & Afrin, S. (2019). A literature review on green supply chain management: Trends and future challenges. *Resources, Conservation and Recycling, 141*, 145-162. DOI: 10.1016/j.resconrec.2018.10.009.

Wang, M., Li, Y., Li, M., Wan, L., Miao, L., & Wang, X. (2019). A comparative study on recycling amount and rate of used products under different regulatory scenarios. *Journal of Cleaner Production*, *235*, 1153-1169. DOI: 10.1016/j.jclepro.2019.06.320.

Xue, D., Teunter, R., Zhu, S. X., & Zhou, W. (2021). Entering the High-end Market by Collecting and Remanufacturing a Competitor's High-end Cores. *Omega*, 102168. DOI: 10.1016/j.omega.2019.102168.

Zhang, W., & He, Y. (2019). Optimal policies for new and green remanufactured short-life-cycle products considering consumer behavior. *Journal of Cleaner Production*, *214*, 483-505. DOI: 10.1016/j.jclepro.2018.12.213.

Zhang, X., Zhang, M., Zhang, H., Jiang, Z., Liu, C., & Cai, W. (2020). A review on energy, environment and economic assessment in remanufacturing based on life cycle assessment method. *Journal of Cleaner Production*, *255*, 120160. DOI: 10.1016/j.jclepro.2020.120160.