International Journal of Industrial Engineering and Management

A two-stage sustainable production-inventory model with carbon credit demand

Y.F. Huang[a], M.W. Weng[a,*], C. J. Fu[b,c]

[a] *Chaoyang University of Technology, Department of Marketing and Logistics Management,Taichung, Taiwan;*

[b] *Chaoyang University of Technology, Department of Business Administration, Taichung, Taiwan;*

[c] *Chaoyang University of Technology, Department of Accounting, Taichung, Taiwan*

References

[1] A. Toptal, H. Ö zlü, and D. Konur, "Joint decisions on inventory replenishment and emission reduction investment under different emission regulations," Int. J. Prod. Res., vol. 52, no. 1, pp. 243-269, 2014, doi: 10.1080/02680939.2018.1435909.

[2] J. Xu , Y. Chen, and Q. Bai, "A two-echelon sustainable supply chain coordination under cap-and-trade regulation," J. Clean. Prod., vol. 135, no. 1, pp. 42-56, 2017, doi: 10.1016/j.jclepro.2016.06.047.

[3] N. Sunar, and L. Plambeck, "Allocating emissions among co-products: Implications for procurement and climate policy," Manuf. Serv. Oper. Manag., vol. 18, no. 3, pp. 414-428, 2016, doi: 10.1287/msom.2015.0572.

[4] X. Hu, Z. Yang, J. Sun, and Y. Zhang, "Carbon tax or cap-and-trade: Which is more viable for Chinese remanufacturing industry?" J. Clean. Prod., vol. 243, 118606, 2020, doi: 10.1016/j.jclepro.2019.118606.

[5] Y. Wang, F. Wang, and Z. Wang, "How carbon allowance allocation rule affects manufacturing/remanufacturing decisions under the carbon credits buy-back policy," Energy Rep., vol. 8, pp. 14061-14071, 2022, doi: 10.1016/j.egyr.2022.10.346.

[6] E. W. Taft, "The most economical production lot," Iron Age, vol. 101, no.18, pp. 1410-1412, 1918.

[7] T. Odanaka, "Deterministic inventory problem with non-constant demand," J. Inform. Optim. Sci., vol. 3, no. 3, pp. 209-228, 1982, doi: 10.1080/02522667.1982.10698733.

[8] X. Chen, and P. Hu, "Joint pricing and inventory management with deterministic demand and costly price adjustment," Oper. Res. Lett., vol. 40, no. 5, pp. 385389, 2012, doi: 10.1016/j.orl.2012.05.011.

[9] A. Guria, B. Das, S. Mondal, and M. Maiti, "Inventory policy for an item with inflation induced purchasing price, selling price and demand with immediate part payment," Appl. Math. Model., vol. 37, no. 1-2, pp. 240-257, 2013, doi: 10.1016/j.apm.2012.02.010.

[10] C.T. Yang, Q. Pan, L.Y. Ouyang, and J.T. Teng, "Retailer's optimal order and credit policies when a supplier offers either a cash discount or a delay payment linked to order quantity," Eur. J. Ind. Eng., vol. 7, no. 3, pp. 370-392, 2013, doi: 10.1504/EJIE.2013.054132.

[11] S. Panda, N.M. Modak, and L.E. Cárdenas-Barrón, "Coordinating a socially responsible closed-loop supply chain with product recycling," Int. J. Prod. Econ. vol. 188, pp. 11-21, 2017, doi: 10.1016/j.ijpe.2017.03.010.

[12] U. Mishra, J.Z. Wu, Y.C. Tsao, and M.L. Tseng, "Sustainable inventory system with controllable non-instantaneous deterioration and environmental emission rates," J. Clean. Prod., vol. 244, 118807, 2020, doi: 10.1016/j.jclepro.2019.118807.

[13] S. Saha, and S.K. Goyal, "Supply chain coordination contracts with inventory level and retail price dependent demand," Int. J. Prod. Econ., vol. 161, pp. 140152, 2015, doi: 10.1016/j.ijpe.2014.12.025.

[14] S. Pal, G.S. Mahapatra, and G.P. Samanta, "A three-layer supply chain EPQ model for price- and stock-dependent stochastic demand with imperfect item under rework," J. Uncertain. Anal. Appl., vol. 4, no. 10, 2016, doi: 10.1186/s40467-016-0050-3.

[15] S.C. Chen, J. Min, J.T. Teng, and F. Li, "Inventory and shelf-space optimization for fresh produce with expiration date under freshness- and-stock-dependent demand rate," J. Oper. Res. Soc., vol. 67, no. 6, pp. 884-896, 2016, doi: 10.1057/jors.2015.100.

[16] T. Avinadav, A. Herbon, and U. Spiegel, "Optimal inventory policy for a perishable item with demand function sensitive to price and time," Int. J. Prod. Econ., vol. 144, no. 2, pp. 497-506, 2013, doi: 10.1016/j.ijpe.2013.03.022.

[17] G. Dobson, E.J. Pinker, and O. Yildiz, "An EOQ model for perishable goods with age-dependent demand rate," Eur. J. Oper. Res., vol. 257, no. 1, pp. 84-88, 2017, doi: 10.1016/j.ejor.2016.06.073.

[18] C.H. Glock, M.Y. Jaber, and C. Searcy, "Sustainability strategies in an EPQ model with price- and quality-sensitive demand," Int. J. Logist. Manag., vol. 23, no. 3, pp. 359, 2012, doi: 10.1108/09574091211289219.
[19] L.A. San-José, J. Sicilia, and D. Alcaide-López-de-Pablo, "An inventory system with demand dependent on both time and price assuming backlogged shortages," Eur. J. Oper. Res., vol. 270, no. 3, pp. 889-897, 2018, doi: 10.1016/j.ejor.2017.10.042.
[20] C.Y. Dye, "Optimal joint dynamic pricing, advertising and inventory control model for perishable items with psychic stock effect," Eur. J. Oper. Res., vol. 283, no. 2, pp. 576-587, 2020, doi: 10.1016/j.ejor.2019.11.008.
[21] C.Y. Dye and C.T. Yang "Sustainable trade credit and replenishment decisions with credit-linked demand under carbon emission constraints," Eur. J. Oper. Res., vol. 244, no. 1, pp. 187-200, 2015, doi: 10.1016/j.ejor.2015.01.026.
[22] A.A. Taleizadeh, L. Aliabadi, and P. Thaichon, "A sustainable inventory system with price-sensitive demand and carbon emissions under partial trade credit and partial backordering," Oper. Res., vol. 22, pp. 4471-4516, 2022, doi: 10.1007/s12351-021-00683-w.
[23] A. Rezaee, F. Dehghanian, B. Fahimnia, and B. Beamon, "Green supply chain network design with stochastic demand and carbon price," Ann. Oper. Res., vol. 250, no. 2, pp. 463-485, 2017, doi: 10.1007/s10479-015-1936-z.
[24] R. Olschewski and P.C. Benítez, "Optimizing joint production of timber and carbon sequestration of afforestation projects," J. For. Econ., vol. 16, no. 1, pp. 1-10, 2010, doi: 10.1016/j.jfe.2009.03.002.
[25] S. Ruidas, M. R. Seikh, and P. K. Nayak, "An EPQ model with stock and selling price dependent demand and variable production rate in interval environment," Int. J. Syst. Assur. Eng. Manag., vol. 11, pp. 385-399, 2020, doi: 10.1007/s13198-019-00867-w.
[26] L. Di and Y. Yang, "Greenhouse gas emission analysis of integrated production inventory-transportation supply chain enabled by additive manufacturing," J. Manuf. Sci. Eng., vol. 144, no. 3, 031006, 2022, doi: 10.1115/1.4051887.
[27] S. Ruidas, M. R. Seikh, and P. K. Nayak, "A production inventory model for high tech products involving two production runs and a product variation," J. Ind. Manag. Optim., vol. 19, no. 3, pp. 2178-2205, 2023, doi: 10.3934/jimo.2022038.
[28] S. Ruidas, M. R. Seikh, P. K. Nayak, and M.T. Tseng, "An interval-valued green production inventory model under controllable carbon emissions and green subsidy via particle swarm optimization," Soft. Comput., vol. 27, no. 14, pp. 9709-9733, 2023, doi: 10.1007/s00500-022-07806-1.
[29] B. Xu, and B. Lin, "Investigating the role of high-tech industry in reducing China's CO2 emissions: A regional perspective," J. Clean. Prod., vol. 177, pp. 169-177, 2018, doi: 10.1016/j.jclepro.2017.12.174.
[30] P. Zdraveva, T.O. Grncarovska, and N. Markovska, "Building a sustainable greenhouse gases inventory system in Macedonia," Manag. Environ. Qual., vol. 25, no. 3, pp. 313-323, 2014, doi: 10.1108/MEQ-11-2013-0131.
[31] M.D. Ramandi and M.K. Bafruei, "Effects of government's policy on supply chain coordination with a periodic review inventory system to reduce greenhouse gas emission," Comput. Ind. Eng., vol. 148, 106756, 2020, doi: 10.1016/j.cie.2020.106756.
[32] S. Ruidas, M.R. Seikh, and P.K. Nayak, "A production inventory model with interval-valued carbon emission parameters under price-sensitive demand," Comput. Ind. Eng., vol. 154, 107154, 2021, doi: 10.1016/j.cie.2021.107154.
[33] H. Shahbazi, A.M. Abolmaali, H. Alizadeh, H. Salavati, H. Zokaei, R. Zandavi, S. Torbatian, D. Yazgi, and V. Hosseini, "Development of high-resolution emission inventory to study the relative contribution of a local power plant to criteria air pollutants and Greenhouse gases," Urban. Clim., vol. 38, 100897, 2021, doi: 10.1016/j.uclim.2021.100897.
[34] A.K. Petersen and B. Solberg, "Greenhouse gas emissions, life-cycle inventory and cost-efficiency of using laminated wood instead of steel construction Case: beams at gardermoen airport," Environ. Sci. Policy, vol. 5, pp. 169-182, 2002, doi: 10.1016/S1462-9011(01)00044-2.
[35] B. Wicke, V. Dornburg, M. Junginger, and A. Faaij, "Different palm oil production systems for energy purposes and their greenhouse gas implications," Biomass. Bioenergy, vol. 32, pp. 1322-1337, 2008, doi: 10.1016/j.biombioe.2008.04.001.
[36] Q. H. Zhou, Y. H. Qiu, H. S. Liu, and Y. He, "A performance study on structural parameters of centre-axle-trailer combinations," Int. J. Simul. Model., vol. 22, no. 1, pp. 168–179, 2023, doi: 10.2507/IJSIMM22-1-CO5.
[37] R.H. Su, M.W. Weng, and C.T. Yang, "Effects of social responsibility activities in a two-stage assembly production system with multiple components and imperfect processes," Eur. J. Oper. Res., vol. 293, pp. 469-480, 2021, doi: 10.1016/j.ejor.2020.12.027.
[38] N.M. Modak, N. Kazemi, and L.E. Cárdenas-Barrón, "Investigating structure of a two-echelon closed-loop supply chain using social work donation as a corporate social responsibility practice," Int. J. Prod. Econ., vol. 207, pp. 19-33, 2019, doi: 10.1016/j.ijpe.2018.10.009.
[39] H. Shahbazi, A. M. Abolmaali, H. Alizadeh, H. Salavati, H. Zokazi, R. Zandavi, S. Torbatian, D. Yazgi, and V. Hosseini, "Development of high –resolution emission inventory to study the relative contribution of a local power plant to criteria air pollutants and greenhouse gases," Urban. Clim., vol. 38, 100897, 2021, doi: 10.1016/j.uclim.2021.100897.
[40] Y. Daryanto and H.M. Wee, "Low carbon economic production quantity model for imperfect quality deteriorating items," Int. J. Ind. Eng. Manag., vol. 1, no. 1, pp. 1-8, 2019, doi: 10.24002/ijieem.v1i1.2291.
[41] M.A. Zadjafar and M.R. Gholamian, "A sustainable inventory model by considering environmental ergonomics and environmental pollution, case study: Pulp and papermills," J. Clean. Prod., vol. 199, pp. 444-458, 2018, doi: 10.1016/j.jclepro.2018.07.175.