應用雙階段模糊競局模擬供應鏈聯盟關係

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摘要

現代企業面臨了許多劇烈的挑戰,例如:顧客要求企業在不同的地點給予足量的商品時,企業必須能迅速選定那些上下游 當他的供應鏈夥伴,當然必須以最低的成本或是其他企業考量的目標來完成。許多供應鏈相關的文獻所鑽研的是存貨、排 程與指派問題,然而,很少有文獻提及以競局理論模擬供應鏈夥伴之間的同盟關係。本研究主要目的為:「以競局理論模 擬供應鏈的同盟關係,進而做分析、比較」。問題之假設簡單描述如下:供應鏈中各個夥伴都有各自的目標式與限制式, 各個夥伴都有多個目標式,我們將模擬多個時期的供應鏈問題,並做一些模擬,最後,由結果中說明競局理論模擬同盟關 係之可行性。

關鍵詞:供應鏈,模糊理論,多目標決策,競局理論

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參考文獻

[1] Andreas Otto, Herbert Kotzab, "Does supply chain management really pay? Six perspectives to measure the performance of managing a supply chain," European Journal of Operational Research 144 (2003) 306-320 [2] Anshuman Gupta, Costas D. Maranas, Conor M. McDonald, "Mid-term supply chain planning under demand uncertainty: customer demand satisfaction and inventory management," Computers and Chemical Engineering 24 (2000) 2613-2621 [3] Bard, J. F. and Falk, J. E., "An explicit solution to the multi-level programming problem," Computers and Operations Research, Vol. 9, No. 1, pp. 77-100, 1982 [4] Bellman, R. E. and Zadeh, L. A., "Decision making in fuzzy environment," Management Science, Vol. 17B, No. 3, pp. 141-164, 1970 [5] Bhattacharya U., Rao, J. R. and Tiwari, R. N., "Fuzzy Multi-criteria Facility Location Problem," Fuzzy Sets and Systems, Vol. 51, No. 3, pp. 277-287, 1992 [6] Bthisland, K. E., Powell, S. G. and Pyke, D. F., "Exploiting timely demand information to reduce inventories," European Journal of Operational Research, Vol. 92, No. 2, pp. 239-253, 1996 [7] Chen, Y. W. and Tzeng, G. H., "Fuzzy Multi-objective Approach to the Supply Chain Model," Multiple Objective and Goal Programming: Advances in Soft Computing, Trzaskalik, T. and Michnik, J. (Eds), pp. 221-234, Physica-Verlag (2002) [8] Chen, Y. W. Larbani, M., "Implementing the Supply Chain Management with Fuzzy Alliances," 16th International MCDM Conference, Wien (2002) [9] Chiung Moon, Jongsoo Kim, Sun Hur, "Integrated process planning and scheduling with minimizing total tardiness in multi-plants supply chain," Computers & Industrial Engineering 43 (2002) 331-349 [10] Current, J. R., ReVelle, C. S. and Cohon, M. B., "The maximum covering/shortest path problem: A multi-objective network design and routing formulation," European Journal of Operational Research, Vol. 21, No. 1, pp. 189-199, 1985 [11] Danuta Kisperska-Moron, "Responsibilities for inventory decisions in Polish manufacturing companies," Int. J. Production Economics 81-82 (2003) 129-139 [12] Demeulemeester, E. and Herroelen, W., "A branch-and bound procedure for the multiple restrict-constrained project scheduling problem," Management Science, Vol. 38, No. 12, pp. 1803-1818, 1992 [13] Dobrila Petrovic, Rajat Roy, Radivoj Petrovic, "Modelling and

simulation of a supply chain in an uncertain environment," European Journal of Operational Research 109 (1998) 299-309 [14] Dobrila Petrovic, "Simulation of supply chain behaviour and performance in an uncertain environment," Int. J. Production Economics 71 (2001) 429-438 [15] Dobrila Petrovic, Rajat Roy, Radivoj Petrovic, "Supply chain modelling using fuzzy sets," Int. J. Production Economics 59 (1999) 443-453 [16] Edgar Perea, Ignacio Grossmann, Erik Ydstie, Turaj Tahmassebi, "Dynamic modeling and classical control theory for supply chain management," Computers and Chemical Engineering 24 (2000) 1143-1149 [17] Esmail Mohebbi, "Supply interruptions in a lost-sales inventory system with random lead time," Computers & Operations Research 30 (2003) 411-426 [18] Fedrizzi, M., Kacprzyk, J., and Roubens, M., "Interactive Fuzzy Optimization," Spring-Verlag, New York, 1991 [19] Fredrik Persson, Jan Olhager, "Performance simulation of supply chain designs," Int. J. Production Economics 77 (2002) 231-245 [20] Goldberg, D. E., "Genetic Algorithms in Search, Optimization and Machine Learning," Addison Wesley Publishing Co., Massachusetts, 1989 [21] Hannan E. L., "Linear Programming with Multiple Fuzzy Goals," Fuzzy Sets and Systems, Vol. 6, No. 1, pp. 235-248, 1981 [22] Hokey Min, Gengui Zhou, "Supply chain modeling: past, present and future," Computers & Industrial Engineering 43 (2002) 231-249 [23] Ida, K. and Gen, M., "Improvement of Two-phase Approach for Solving Fuzzy Multi-objective Linear Programming," Journal of Japan Society for Fuzzy Theory and Systems, Vol. 9, No. 1, pp. 115-121, 1997 [24] Lee, E. S. and Li, R. J., "Fuzzy multiple objective programming and compromise with Pareto optimum," Fuzzy Sets and Systems, Vol. 53, No. 3, pp. 275-288, 1993 [25] J. Griffiths, D. Margetts, "Variation in production schedules-implications for both the company and its suppliers," Journal of Materials Processing Technology 103 (2000) 155-159 [26] J.K. Gigler, E.M.T. Hendrix, R.A. Heesen, V.G.W. van den Hazelkamp, G. Meerdink, "O.R. Applications On optimization of agri chains by dynamic programming," European Journal of Operational Research 139 (2002) 613-625 [27] Jean-Claude Hennet, "A bimodal scheme for multi-stage production and inventory control," Automatica 39 (2003) 793-805 [28] John H. Bantham, Kevin G. Celuch, Chickery J. Kasouf, "A perspective of partnerships based on interdependence and dialectical theory," Journal of Business Research 56 (2003) 265-274 [29] Joseph Geunes, Amy Z. Zeng, "Theory and methodology Impacts of inventory shortage policies on transportation requirements in two-stage distribution systems," European Journal of Operational Research 129 (2001) 299-310 [30] Keah Choon Tan, "A framework of supply chain management literature," European Journal of Purchasing & Supply Management 7 (2001) 39-48 [31] Martison, F. K., "Fuzzy vs. Minmax Weighted Multi-objective Linear Programming: Illustrative Comparison," Decision Sciences, Vol. 24, No. 4, pp. 809-824, 1993 [32] Matteo Kalchschmidt, Giulio Zotteri, Roberto Verganti, "Inventory management in a multi-echelon spare parts supply chain," Int. J. Production Economics 81-82 (2003) 397-413 [33] Michalewicz, Z., "Genetic algorithms + Data Structures = Evolution Programs," Springer-Verlag Press, Berlin, 1996 [34] Moutaz Khouja, "Optimizing inventory decisions in a multi-stage multi-customer supply chain," Transportation Research Part E 39 (2003) 193-208 [35] Oxe, G., "Reducing overcapacity in chemical plants by linear programming," Decision Sciences, Vol. 24, No. 4, pp. 809-824, 1993 [36] Petrovic, D., Roy, R. and Petrovic, R., "Modeling and simulation of a supply chain in an uncertain environment," European Journal of Operational Research, Vol. 109, No. 2, pp. 299-309, 1998 [37] Pyke, D. F. and Cohen, M. A., "Performance characteristics of stochastic integrated production-distribution systems," European Journal of Operational Research, Vol. 68, No. 1, pp. 23-48, 1993 [38] Rajesh Piplani, S. Viswanathan, "A model for evaluating supplier-owned inventory strategy," Int. J. Production Economics 81-82 (2003) 565-571 [39] Rasmusen, E., "Games and Information: An Introduction to Game Theory," Blackwell Publishers, Oxford, 1989 [40] S. Bose, J.F. Pekny, "A model predictive framework for planning and scheduling problems: a case study of consumer goods supply chain," Computers and Chemical Engineering 24 (2000) 329-335 [41] Sakawa M., "Fuzzy Sets and Interactive Multi-objective Optimization," Plenum Press, New York, 1989 [42] Sakawa, M., Kato, K., Sunada, H. and Shibano, T., "Fuzzy Programming for Multi-objective 0-1 Programming Problems through Revised Genetic Algorithms," European Journal of Operational Research, Vol. 97, No. 2, pp. 149-158, 1997 [43] Sarkis, J., "Evaluating environmentally conscious business practices," European Journal of Operational Research, Vol. 107, No. 1, pp. 159-174, 1998 [44] Scott J. Mason, P. Mauricio Ribera, Jennifer A. Farris, Randall G. Kirk, "Integrating the warehousing and transportation functions of the supply chain," Transportation Research Part E 39 (2003) 141-159 [45] Shih, H-S, Lai, Y-J and Lee, E. S., "Fuzzy approach for multi-level programming problems," Computers Operations Research, Vol. 23, No. 1, pp. 73-91, 1996 [46] Shotaro Minegishi, Daniel Thiel, "System dynamics modeling and simulation of a particular food supply chain," Simulation Practice and Theory 8 (2000) 321-339 [47] Srinivas Talluri, Ram Narasimhan, "Vendor evaluation with performance variability: A max-min approach," European Journal of Operational Research 146 (2003) 543-552 [48] Stefan Minner, "Multiple-supplier inventory models in supply chain management: A review," Int. J. Production Economics 81-82 (2003) 265-279 [49] Sunil Chopra, "Designing the distribution network in a supply chain," Transportation Research Part E 39 (2003) 123-140 [50] Susan X. Li, Zhimin Huang, Joe Zhu, Patrick Y.K. Chau "Cooperative advertising, game theory and manufacturer-retailer supply chains," Omega 30 (2002) 347-357 [51] Thomas, D. J. and Griffin, P. M., "Coordinated supply chain management," European Journal of Operational Research, Vol. 94, No. 1, pp. 1-15, 1996 [52] Tyndall, G., Gopal, C., Partsch, W. and Kmuauff, J., "Supercharging Supply Chains: New ways to increase value through global operational excellence," John Wiley & Sons, Inc., 1998 [53] Tzeng, G. H. and Tsaur, S. H., "Application of Multiple Criteria Decision Making for Network Improvement Plan Model," Journal of Advanced Transportation, Vol. 31, No. 1, pp. 49-74, 1997 [54] Tzeng, G. H. and Chen, Y. W., "Implementing an Effective Schedule for Reconstructing Post-earthquake Road-network Based on Asymmetric Traffic Assignment -An Application of Genetic Algorithm," International Journal of Operations and Quantitative Management (IJOQM), Vol. 4, No. 3, pp. 229-246, 1998 [55] Vaidyanathan Jayaraman, Anthony Ross, "Production, Manufacturing and Logistics A simulated annealing methodology to distribution network design and management," European Journal of Operational Research 144 (2003) 629-645 [56] Vidal, C. J. and Goetschalckx, M., "Strategic production-distribution models: a critical review with emphasis on global supply chain models," European Journal of Operational

Research, Vol. 98, No. 1, pp. 1-18, 1997 [57] Young Hae Lee, Sook Han Kim, "Production-distribution planning in supply chain considering capacity constraints," Computers & Industrial Engineering 43 (2002) 169-190 [58] Young Hae Lee, Chan Seok Jeong, Chiung Moon, "Advanced planning and scheduling with outsourcing in manufacturing supply chain," Computers & Industrial Engineering 43 (2002) 351-374 [59] Young Hae Lee, Min Kwan Cho, Seo Jin Kim, Yun Bae Kim, "Supply chain simulation with discrete-continuous combined modeling," Computers & Industrial Engineering 43 (2002) 375-392 [60] Yu, P. L. and Seiford, L., "Multilevel Decision Problems with Multiple Criteria Analysis-Operation Method," edited by Nijkamp, P., Gover Publishers, 1981 [61] Zhimin Huang, Susan X. Li, "Co-op advertising models in manufacturer-retailer supply chains: A game theory approach," European Journal of Operational Research 135 (2001) 527-544