

CO-OPETITION AND CONTRACTS BETWEEN HAULAGE AND 3PL COMPANIES

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*"Keep your friends close but your enemies even closer"**Michael Corleone, Godfather II*

In supply chain co-opetition, firms may have both a competitive and co-operative relationship, working to influence demand by investing in demand-enhancing efforts, e.g., investment in technology by one firm to improve product quality, as well as investment in selling effort by the other firm to develop the market for the product (Brandenburger & Nalebuff, 1996). For example, Toyota, Citroen and Peugeot, sharing expertise and joint production of components (chassis, engine) on a compact city car, enable saving money on common expenses while remaining highly competitive in other areas.

In the international bibliography researchers have focused on supply-chain co-ordination by means of mechanism incentive planning (buy-back agreement, information sharing, transfer payment contracts). The article of Gumani, Erkoc, & Luo (2007) detailed for the first time the study of various types of structure and decision-making, as well as simultaneous use of billing and non billing factors so as to cooperate and compete within the same chain.

We proceed one step further by attempting to create innovative contracts which coordinate members of the supply chain by applying co-opetition between a haulage company (i.e., a pure transportation company) and a 3PL services company (i.e., a full logistics service company). Consideration is given to the problem of supply contract design for one-time interaction between a haulage company and a 3PL company, an assumption widely used in supply chain contractual literature and applicable to many settings, including those with seasonal or high-tech products.

The problem is studied at macro level in order to investigate the incentives and equilibrium investment policies in a two-echelon supply chain; the contribution of our research is to study the effect of the timing of price commitment decisions on the investment decisions and profits of the two firms. While both the firms can benefit from each other's investments in new trucks and selling effort respectively, the timing of the price commitment decisions influences the level of investment by the firms.

In future we will consider different cases on decision-making (according to their time cycle), and their corresponding mathematical treatment in order to improve profit results for both companies. The results of contracts will be expanded with asymmetric information, and we will endeavour to put into practice, reach conclusions and draw a comparison with the theoretical results.

References

Brandenburger, A. M., & Nalebuff, B. J. (1996). *Co-opetition*. New York: Doubleday Currency.

Gumani, H., Erkoc, M., & Luo, Y. (2007). Impact of product and timing of investment decisions on supply chain co-opetition. *European Journal of Operational Research* 180, pp.228-248.

Additional Readings

Anupindi, R., & Bassok, Y. (1999). *Supply contracts with quantity commitment and stochastic demand*. Kluwer Academic Publishers, pp.197-232.

Bukchin, Y., & Hanany, E. (2007). Decentralization Cost in Scheduling: A Game-Theoretic Approach. *Manufacturing and Service Operation Management*, pp.263-275.

Cachon, G. P., & Zipkin, P. H. (1999). Competitive and Cooperative Inventory policies in Two-stage Supply Chain. *Management Science*, pp.936-953.

Huang, Z., & Li, S. (2000). Co-op advertising models in manufacturer-retailer supply chains: A game theory approach. *European Journal of Operational Research* 135, pp.527-544.

Nash, J. F. (1951). Non-Cooperative Games. *Annals of Mathematics*.

Netessine, S., & Zhang, F. (2005). Positive Vs negative externalities in inventory management: Implications for Supply Chain Design. *Manufacturing and Service Operations Management*, pp.58-73.

Parlar, M., & Weng, Z. (2006). Coordinating pricing and production decisions in the presence of price competition. *European Journal of Operational Research* 170, pp.211-227.