

Implementing Economic Incentive Schemes for a Global Supply Chain Quality Optimization

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Abstract: In order to lower manufacturing costs and raise flexibility, global supply chain has become a widely adopted production pattern nowadays. However, because of its characteristics of cross-nations, cross-cultures, and weak links, to manage the quality of global supply chain is not an easy task. In a global supply chain, the initiating company often encounters a principal-agent problem that the suppliers may not produce the ideal quality even if the outsourced component is delivered in due date. This is not only a moral problem, but also an incentive problem. The economics theories suggest that sufficient incentives will be required to solve such problem, while the measurement of quality efforts, suitable incentive schemes, and optimal incentive amounts for a global supply chain still have not been established in the literature. The purpose of this paper is to combine activity-based costing (ABC) with economic incentive schemes (EIS) to develop the system of suitable

incentive schemes for a global supply chain quality management. A zero-one goal programming (ZOGP) model is proposed to decide the optimal qualities after the activity cost analyses, then the optimal qualities are utilized to determine the economic incentive schemes and optimal incentive amounts. The cases of full information and asymmetric information are distinguished. The integration of ABC and EIS can make the initiating company use lower but effective expenses to boost product qualities. An illustrative case study is provided, and the sensitivity analysis is also presented in this paper.

Keywords: Global supply chain; Activity-based costing and management, Quality management and optimization; Economic incentive schemes; zero-one goal programming (ZOGP); Full information; Asymmetric information