

Optimizing Delivery Fees for a Network of Distributors

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The third-party logistics industry has grown rapidly in recent years, accounting for \$46 billion of the total \$921 billion in logistics spending in the United States during 1999. This figure is expected to grow by 15 to 20% annually as manufacturing firms increasingly partner with third-party logistics providers to cost effectively distribute their products, while meeting increasingly stringent service expectations of customers. These logistics partnerships have introduced a new set of decision requirements to negotiate compensation for distribution services. Based on a collaborative project with a leading building products manufacturer, this paper describes the development and implementation of a novel linear programming model to decide the delivery fees paid to distributors. The model applies to manufacturer-distributor partnerships where distributors are compensated using fee values that depend on delivery weights and distances. It ensures that the expected compensation, considering stochastic demands, is adequate to cover the aggregate distribution costs for each distributor, and permits imposing various consistency conditions to ensure that fee values are credible. The model proved effective in helping the manufacturer develop a new fee table that generated considerable economic savings and provided more equitable compensation to distributors.

(Third-Party Logistics; Distribution; Supply Chain; Compensation; Applied Optimization; Linear Programming)
