

Decision Making in a Supply Chain with Customer Return and Buyback Policies

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ABSTRACT

Products returned by the customer are common in the retail industry. Nowadays, many retailers implement customer product return policy to handle customer's dissatisfaction. Buyback policy by the manufacturer is also common to deal with the customer return policy. Customer product return policy will attract the customer to purchase more products to the retailer; and buyback policy will encourage the retailer to order more products to the manufacturer. In the presence of both policies in the supply chain, the manufacturer and the retailer have to determine the optimal decision to achieve maximize profit. Therefore, this research discusses about optimal decision making in single period supply chain problem with the objective of profit maximization that consists of the retailer who sells the product to the customer and implementing the full refund customer product return policy; and the manufacturer who supplies the product to the retailer and implementing the buyback policy for the returned product and unsold inventory. The retailer will determine the retail price and order quantity given the wholesale price and buyback price, and the manufacturer will determine the wholesale price and buyback price given the retailer's optimal decision

The mathematical model for the cost, revenue, and profit of the retailer and the manufacturer are constructed here, and then the optimal decisions are determined based on these equations. The optimal decision making of both parties are then proved by the numerical examples given some number of parameters. The numerical experiments sensitivity analysis for the change in unit profit, base demand, price sensitivity, and return rate are also constructed to analyze the responds of both parties in the change of some parameters.

By this research, we can observe the impact of changing in unit profit, base demand, price sensitivity, and return rate on the retailer's and the manufacturer's profit; and also their respond of optimal decision facing these changes. Lower unit profit, lower base demand, high sensitivity of price and high return rate will have negative impact for the retailer and the manufacturer.

Keyword: Supply chain, Customer product return policy, Buyback policy, Price-sensitivity demand