

## **An Application of Bidirectional Option Contract to Coordinate a Dyadic Fashion Apparel Supply Chain**

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**Abstract :** Since the inception, the fashion apparel supply chain is facing the problem of high demand uncertainty. Often the demand volatility compels the corresponding supply chain member to incur substantial holding cost and opportunity cost in case of the overproduction and the underproduction scenario, respectively. It leads to an uncoordinated fashion apparel supply chain. There exist several scholarly works to achieve coordination in the fashion apparel supply chain by employing the different contracts such as the buyback contract, the revenue sharing contract, the option contract, and so on. Specially, the application of option contract in the apparel industry becomes prevalent with the changing global scenario. Exploration of existing literature related to the option contract reveals that most of the research works concentrate on the one direction demand adjustment i.e. either to match the demand upwards or downwards. Here, we present a holistic approach to coordinate a dyadic fashion apparel supply chain comprising one manufacturer and one retailer with the help of bidirectional option contract. We show a combination of wholesale price contract and bidirectional option contract can coordinate the under expanded supply chain. We also propose a framework that captures the variation of the apparel retailer's order quantity and the apparel manufacturer's production quantity with the changing exercise price for the different ranges of the option price. We analytically explore that corresponding cost parameters of the supply chain members along with the nature of demand distribution play an instrumental role in the coordination as well as the retailer's ordering decision.

**Keywords :** fashion apparel supply chain, supply chain coordination, wholesale price contract, bidirectional option contract

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