Lingnan University 嶺南大學 香港 Hong Kong | Faculty of Business 嶺南大學商學院

Department of Operations and Risk Management
Hong Kong Institute of Business Studies

EDUCATION for SERVICE 作育英才・服務社會

POSTGRADUATE SEMINAR SERIES

Research Findings Seminar

Topic Title : **Supplier-Led Channel Management with Option Contracts and Cooperative Advertising**

Presenter : **Mr. SHARIF Muhammad Mudassar**
PhD Student of Operations and Risk Management

Abstract : Cooperative advertising refers to arrangements whereby a supplier subsidizes part of a retailer's advertising expenditure to enhance demand and improve channel performance. However, it cannot coordinate both inventory and advertising decisions simultaneously under stochastic demand, leading to inefficiencies in decentralized supply chains. To address these intertwined inefficiencies, two studies are proposed that integrate option contracts with cooperative advertising to examine supply chain coordination. We analyze a supplier-led decentralized supply chain under additive, effort-dependent stochastic demand in a leader–follower setting.

The first study investigates a Put-Option with Cooperative Advertising (PO-CA) contract. Three contracts are examined: the wholesale price contract as a benchmark, a pure put-option contract without cooperative advertising, and the proposed PO-CA contract. Results show that the wholesale price contract suffers from double marginalization, while the put-option-only contract, though it can theoretically coordinate the supply chain, eliminates supplier's profit and is therefore unsustainable. In contrast, the PO-CA contract coordinates both order quantity and promotional efforts by carefully calibrating the wholesale price, option premium, exercise price, and supplier participation in advertising. A significant finding and contribution of this study is the identification of a "coordination space," which refers to the range of exercise prices and participation rates that allow the supply chain to achieve maximum profit. We also show that there is a critical stockout penalty threshold that determines the type of coordination: when penalties are high, coordination is robust and works across a wide range of parameters, but when penalties are low, coordination becomes conditional and only possible under stricter limits. Sensitivity analysis further explains how this coordination space shifts with market factors such as production cost, retail price, and salvage value. We also demonstrate that within this space there exists a Pareto-improvement region, which guarantees win–win outcomes where both the supplier and the retailer earn higher profits compared to the wholesale price benchmark.

The second study explores supply chain coordination by integrating Call-Option contracts with Cooperative Advertising (CO-CA) under a make-to-stock settings. Our analysis reveals that while a pure call-option contract can theoretically achieve coordination by aligning retailer decisions with centralized outcomes, it results in zero option order quantity and no expected profit for the supplier. In contrast, the CO-CA contract successfully aligns the retailer's ordering and promotional decisions with centralized benchmarks, achieving perfect coordination. An important outcome of this study is the derivation of a feasible negotiation space for the exercise price and advertising share, which guarantees maximum total profit while providing a "safe zone" for bargaining. Within this space, the advertising share uniquely functions as a pure risk-allocation parameter, allowing partners to shift inventory risk without distorting coordination. Moreover, a Pareto-improving region is identified where both parties achieve strictly higher profits than under the wholesale contract, ensuring a win–win outcomes.

Date : **17 October 2025, Friday**

Time : **10:00 – 11:30**

Venue : **SEK108, 1/F, Simon & Eleanor Kwok Building**

Language : **English**

**** All are Welcome ****

Enquiries: HKIBS, 26168373 or by email(hkibs@ln.edu.hk).

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