

多产品协同促销模式下的零售商促销时间决策模型

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A Decision Model for Promotion Time in Multi-products Price Promotion Based on the Profit of Retailers

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摘要 本文利用某大型连锁超市的销售数据,从零售商整体利润的角度对价格促销进行研究。构建了多产品协同促销模式下的促销时间决策模型,将多种不同产品及其促销时间同时纳入模型进行研究。结果表明,零售商对多个产品所进行的价格促销能够显著地影响其整体利润。而且,价格促销的效果随着促销时间的延续而降低,周末时的促销效果明显优于工作日。因此,在多产品协同促销模式下,利用本文构建的决策模型,零售商可以根据不同产品对企业整体利润的贡献来决定其促销时间,从而合理规划促销组合。

关键词: 价格促销 零售商 利润 促销时间

Abstract: In the mounting competition of the retailing business, price promotion is one of the frequently used strategies and becomes the major part of retailers' marketing budget. Previous researches on price promotion often focus on particular brands or products from manufacturers' perspective. Few are conducted for retailers. To fill the gap in price promotion literature, the present study developed this multi-products promotion model to evaluate the effects of price promotion on the profit of retailers by simultaneously taking multiple products and their promotion time into consideration. The multi-products promotion model is as followed:

$$Y_i = \omega_0 + \omega W_i + \gamma_0 \sum_{j=1}^p X_{ij} + \gamma_1 \sum_{j=1}^p X_{ij} T_{ij} + \gamma_2 \sum_{j=1}^p X_{ij} P_{1j} + \gamma_3 \sum_{j=1}^p X_{ij} P_{2j} + \gamma_4 \sum_{j=1}^p X_{ij} P_{3j} + \gamma_5 \sum_{j=1}^p X_{ij} D_{1j} + \gamma_6 \sum_{j=1}^p X_{ij} D_{2j} + \gamma_7 \sum_{j=1}^p X_{ij} W_i + \mu_i$$

where Y_i is the retailer's profit in day i , $X_i = (X_{i1}, X_{i2}, \dots, X_{ip})$ and X_{ij} is the promotion degree of j th product in day i , p is the total number of products. T_{ij} is the total promotion days of j th product from the beginning to day i , P_{1j}, P_{2j}, P_{3j} are category characteristics variables, D_{1j}, D_{2j} are product specific variables, W_i is a dummy variable to denote whether day i is weekend. $\omega_0, \omega, \gamma_0, \gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7$ are the parameters to be estimated. This paper used the daily sales records in 159 days from a large chain supermarket for empirical analysis. The data included the name, id number, price, daily sales volume and promotion price of products which are sold by the supermarket. Preliminary calculation were conducted to quantify the products characteristics, category characteristics and promotion time. By introducing these characteristics variables, we could examine the effects that price promotion of individual product has on the retailer's profit. Results shows that price promotion of individual product can significantly affect the total profit of the retailer. Moreover, the effect of price promotion is significantly related to promotion time and whether in weekend or not. As time goes on, the promotion effect decreases and even becomes negative on retailer's profit. The promotion effect is better in weekend than in weekdays. So determining the proper promotion time for promoting products is critical for retailers. This study extended the previous promotion research by emphasizing on retailers and developing an empirical model to examine the role of individual product's promotion on retailers profit. By employing this model, retailers can develop more scientific and feasible price promotion strategies for individual product. In particular, retailers can dynamically monitor the impact of every product in promotion on the profit of the entire store and accordingly adjust promotion time to maximize their profit.

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