UNIVERSITY OF MANNHEIM
Business School

CHAIR OF SERVICE
OPERATIONS MANAGEMENT
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Master Thesis Proposal

Assortment and Price Optimization under Context-Dependent Choice Models

Discrete choice models are used to describe and predict individuals' decision-making among a set of alternatives. It captures how consumers trade off attributes of different options based on their preferences. Common models include the multinomial logit (MNL) and nested logit models. They are widely applied in marketing, economics, and operations to optimize pricing, product design, and assortment planning. These models were mostly derived from the assumption that the perceived utility that customers get from individual products is merely dependent on the product's own features. However, numerous studies in the marketing and cognitive science literature have shown that the assumption of utility being independent of the presence or absence of other options often fails to align with observed consumer choices and is in contrast with the so-called "context effects". Context effects refer to that consumers evaluate each option by considering both its absolute utility and its relative standing in the choice set (Trueblood et al. 2013). Recently, researchers incorporated context effects into discrete choice models to study its predictive power and address assortment and price optimization problems within the framework of context-dependent preferences.

The objectives of the master thesis are to

- review the literature on discrete choice models with context effects, published in leading academic journals, such as European Journal of Operational Research, Production and Operations Management, Management Science, Marketing Science, or working papers,
- delve into a specific paper that addresses assortment or price optimization problems based on a discrete choice model with context effects, examining its model, advantages, limitations, and applications,
- propose one extension of the specific paper in detail, in terms of the motivation, model, advantages, and challenges,
- identify and discuss open research gaps and future trends in the field of discrete choice models with context effects.

Requirements

- OPM 781
- Good knowledge in Operations and Revenue Management
- Analytical skills and an ability to transform real-world business problems into Operations Research models

Administrative information for writing a master thesis at the Chair of Service Operations Management can be found here.

Selected Literature Recommendations

Bai, Y., El Housni, O., Rusmevichientong, P., & Topaloglu, H. (2023). Assortment and price optimization under an endogenous context-dependent multinomial logit model. Available at SSRN 4534984.

Bai, Y., El Housni, O., Rusmevichientong, P., & Topaloglu, H. (2025). An Endogenous Multinomial Logit Model with Population-Based Purchase Feedback: Assortment Optimization, Pricing and Estimation.

Guo, L. (2016). Contextual deliberation and preference construction. Management Science, 62(10), 2977-2993.

Trueblood, J. S., Brown, S. D., Heathcote, A., & Busemeyer, J. R. (2013). Not just for consumers: Context effects are fundamental to decision making. Psychological science, 24(6), 901-908.

Yousefi Maragheh, R., Chen, X., Davis, J., Cho, J., Kumar, S., & Achan, K. (2020). Choice modeling and assortment optimization in the presence of context effects. Available at SSRN 3747354.

Zheng, Q., Pan, X. A., & Carrillo, J. E. (2019). Probabilistic selling for vertically differentiated products with salient thinkers. Marketing Science, 38(3), 442-460.