

# Foreword

Following the success of low cost carriers, dynamic pricing has become one of the most popular fields of research at the interface of Marketing and Operations Management. However, analyzing the available literature reveals that most publications concentrate on the development of optimization models for price variation. The major challenge of forecasting demand is most often ignored. With his dissertation, Steffen Christ aims to close the corresponding gap by examining the applicability of existing optimization models for dynamic pricing on the specifics of highly volatile consumer markets using the example of low cost air carriers. The explicit objective is the operationalization of theoretically sound standing dynamic pricing models using only realistic input assumptions and retracting to factually available data.

The approach chosen by Steffen Christ is rooted in the development of self learning demand models that calibrate their parameters as data becomes available yielding the option of using the returned results as input to conventional dynamic pricing models. It claims that the developed models can provide parts of the necessary input data in a merely plug-and-play fashion. Generally, the work of Steffen Christ targets the understanding of both relevant input values for dynamic pricing models, forecasting of latent price-independent demand and models that estimate the price sensitivity of such latent demand.

For forecasting of latent demand, Steffen Christ develops a method, which is based on a Bayesian interpretation of linear regression modeling. Here, the parameters of a linear function are not considered deterministic, unknown and to be estimated based on a stochastic data set, but are considered random numbers each with a stochastic distribution that is iteratively learned based on collected data itself seen as deterministic. The method is less prone to distortions if few data is available and explicitly allows the inclusion of subjective or expert knowledge into the estimation process.

The concluding evaluation of different self-learning models is done using a proprietary software environment. The forecast error for latent demand

ranges between 16.1 – 17.4% based on single values and 11.2 – 12.7% based on the total demand for a single flight leg.

Furthermore, Steffen Christ considers the estimation of purchase behavior for individuals expressing such latent demand. The chosen method Customer Choice Modeling uses disaggregate observations of discrete and individual customer behavior that depend on the different price points for air travel found in the market and their individual attributes (e.g., flight schedule). Through the combination of multiple databases (the demand protocol from the airline's online channel, its computer reservation system and pricing data collected through web crawlers) Steffen Christ is able to construct a comprehensive data field providing revealed preferences as basis for the estimation of individual purchase behavior.

That later model yields a forecast error of 14 – 27% on the completed bookings for the outbound direction and 26 – 39% for the inbound directions, what is considered satisfactory based on the data limitations concerning bookings received by the considered airline's competition.

In summary, Steffen Christ shows with his work that it is indeed possible to develop forecasting models for both, latent demand and purchase behavior, even in highly dynamic and volatile markets. His excellent work is of high relevance for both, researchers and industry experts in the field of dynamic pricing. I hope, that his work will find many readers and will receive the recognition it deserves.

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