Capturing Calendar Time Events in Latent Attrition Models: The Case of Seasonality

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Abstract

In recent years, several authors developed models for customer base analysis in non-contractual relationships, which consistently assume a homogeneous Poisson or Gamma purchase process on the individual level. Both processes are characterized by stationarity and the individual purchase rates of these models do not change over time. Therefore, these models are not able to account for calendar time events like long run trends, short-term event, or cyclicality, where individual purchase probabilities temporarily in- or decrease. The paper develops a generalized purchase probability model that accounts for seasonal effects in the (re)purchasing pattern of customers. It employs a cyclical trend function and thus relaxes the stationarity assumption of the former models. The empirical analysis of a seasonal data set demonstrates a superior performance on model fit, but inferior prognostic power.

Keywords: *nonhomogeneous Poisson process; customer base analysis; seasonality*

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