

The role of time-varying contextual factors in latent customer attrition models

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Valuing customers is essential to any firm. By identifying the most and least valuable customers, marketers can improve the efficiency of marketing campaigns. With the Pareto/NBD model, modeling customer life-time value for non-contractual businesses has become a straight-forward task, but this simplicity comes at a price. Individual-level predictions of customer lifetime value often lack precision. Acknowledging the importance of contextual factors for customer behavior might improve the precision and thus the applicability of customer valuation approaches for targeting and reporting. However, there is no generalization of the Pareto/NBD model that allows time-varying contextual factors to be considered. This study proposes a closed-form maximum likelihood extension to the Pareto/NBD model that allows both time-invariant and time-varying contextual factors to be modelled in continuous non-contractual settings. These contextual factors can influence either the purchase or the attrition process, or both. A benchmark using three datasets from the retailing industry shows a significant improvement in prediction accuracy for future customer activity when explicitly modeling time-varying contextual factors.

Key words: customer lifetime value, probability models, Pareto/NBD, customer relationship management, latent attrition, contextual factors

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