

Authors: H. Frydman, A.Matuszyk,

Title: Application of the Random Survival Forest to the financial competing risks data

*Abstract*

An analysis of time-to-event when a customer can experience more than one type of credit event is referred to as competing risks analysis. In general a customer under study can experience a number of fixed distinct credit event types.

The purpose of our project is to introduce Random Survival Forest for Competing Risks (RSFCR) to the financial literature concerned with modelling survival of loan (or a lease) in the presence of competing events such as default and early repayment. In the extant literature Cox proportional hazard model for competing risks (CoxCR) has been considered as a benchmark model. We apply RSFCR to a large data set on car leases and compare its prediction performance with that of CoxCR. In our analysis we consider default and early repayment as two competing risk events. We show that RSFCR substantially dominates CoxCR model in terms of prediction accuracy measured by Brier score.

*Keywords:* Competing Risks, Random Survival Forest model, Cox proportional hazard model, Brier score.