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Smooth Baseline Hazard Modelling for Corporate Exits

There is a large amount of publicly available financial information on publicly traded corporations, usually on a quarterly year time period. These same corporations also undergo bankruptcy or acquisition through merger. It is natural to model these in a discrete time framework due to the nature of the data. We consider a bivariate discrete time hazard model. The framework is similar to that in classical biostatistics modeling, where one treats the two forms of exit from the system, namely bankruptcy and merger/acquisition, but with additional information on the type of exit. In biostatistics the cause of exit (usually death) is not known explicitly.

Such models are constructed and fit to a data base of some 12,000 publicly traded US corporations. With a large number of covariates some data reduction is needed. Both in and out of sample prediction is considered. A constant baseline hazard model does not fit well, so a smooth baseline hazard model is considered. This later model seems to give a reasonable fit in terms of prediction, and has a nice robustness property. Some tools for model assessment are developed. One useful tool for this is a limit theorem on rare multinomials which is originally due to McDonald (1980).