

We propose a general class of flexible models for longitudinal data with special emphasis on discrete-time survival data. The model is a finite mixture model where the subjects are allowed to move between components through time. The time-varying probabilities of component memberships is modeled as a function of subject-specific time-varying covariates. This allows for interesting within-subject dynamics and manageable computations even with a large number of subjects. Each parameter in the component densities and in the mixing function is connected to its own set of covariates through a link function. The models are estimated using a Bayesian approach via a highly efficient Markov Chain Monte Carlo (MCMC) algorithm with tailored proposals and variable selection in all set of covariates. The focus of the paper is on models for discrete-time survival data with an application to bankruptcy prediction for Swedish firms, using both exponential and Weibull mixture components. The dynamic mixture-of-experts models are shown to have an interesting interpretation and to dramatically improve the out-of-sample predictive density forecasts compared to models with time-invariant mixture probabilities.