Competing Risks Model for Corporate Exit Analysis : Discrete Hazard Model and Extension with Stochastic Frailties

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Abstract: Publicly traded companies can leave a public system by bankruptcy or an exit due to merger. Discrete sub-hazard functions are modeled with a multinomial logit model. For 12,571 U.S. industrial firms spanning 1980 to 2004, quarterly firm specific financial variables and macroeconomic variables are available. Time-varying baseline hazard functions may capture unobservable or missing macroeconomic information. We examine the relationship between the effect of smoothing baseline hazard estimators and inclusion of macroeconomic variables. Smoothed nonparametric estimates of previous quarters baseline hazard functions are used for one step ahead predictions. A prediction power association methods are used currently in the literature. We propose a more direct method that yields an estimate of the probability of bankruptcy/merger for each company and hence a prediction of bankruptcy/merger in the next quarter. Optimal roughness penalties are chosen to minimize the sum of Shannon's entropies for all prediction periods.