Time Dependent Effects in Event History Analysis

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We discuss the estimation of time-dependent coefficients in two settings: an extension for the univariate Cox model, derived by Murphy and Sen (1991) and a more complex situation, where a non-homogeneous progressive multi-state model is considered. The estimation is based on the *Sieves method* (Greenander, 1981). The methodology is illustrated considering two practical examples. In the first example, we consider the usual (proportional hazards) Cox model and show that the proportionality assumption is violated with the available data. Time dependent effect is used as an alternative approach. In the second example, the process generating the data naturally leads to the need for a time varying effect.

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