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Filtered Likelihood for Point Processes

Kay Giesecke and Gustavo Schwenkler

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Abstract

Point processes are widely used in finance and economics to model the timing of defaults, market transactions, unemployment spells, births, and a range of other events. We develop and analyze likelihood estimators for the parameters of a marked point process and incompletely observed explanatory factors that influence the arrival intensity and mark distribution. We establish an approximation to the likelihood and analyze the convergence and large-sample properties of the associated estimators. Numerical results illustrate the behavior of our estimators.

Keywords: Point processes, filtering, efficient parametric inference, maximum likelihood, likelihood approximation. JEL Codes: C13, C32, C41, C58, C63.

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