

A Time-Varying Parameter Model for Local Explosions

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Abstract: This paper introduces a new time-varying parameter model for local explosions. Explosions are observed in economic and financial time-series when bubbles are formed. The proposed model can be used to describe and predict the emergence, existence and burst of bubbles. We use a flexible observation driven formulation that allows for different bubble shapes and behavior. We establish stationarity, ergodicity, fading memory and bounded moments of the data generated by our model and obtain the consistency and asymptotic normality of a maximum likelihood estimator. We also demonstrate that sample paths converge, so that we can filter data to separate and identify the unobserved bubble. We study the finite-sample properties of our indirect estimator through a comprehensive Monte Carlo simulation. Finally we apply the model in a financial application.