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# Modelling Structural Breaks in Stock Price Time Series Using Stochastic Differential Equations

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**Abstract :** This paper studies the effect of quarterly earnings reports on the stock price. The profitability of the stock is modeled by geometric Brownian diffusion and the Constant Elasticity of Variance model. We fit several variations of stochastic differential equations to the pre-and after-report period using the Maximum Likelihood Estimation and Grid Search of parameters method. By examining the change in the model parameters after reports' publication, the study reveals that the reports have enough evidence to be a structural breakpoint, meaning that all the forecast models exploited are not applicable for forecasting and should be refitted shortly.

**Keywords :** stock market, earnings reports, financial time series, structural breaks, stochastic differential equations
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