Identifying and Comparing Change Points in Stock Market Data

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1 Introductions

In univariate segmented regression models, the independent variable is partitioned into disjoint intervals and separate line segments are fitted to each interval. The boundaries of these intervals are called breakpoints. Segmented regression can be used to model the stock market data with respect to continuous time, and by identifying the breakpoints one can tell when the trend of the stock market starts to change. Most of the current studies focus on developing rigorous statistical methods to fit segmented regression models and identify breakpoints, but an easy-to-use tool to identify and compare breakpoints obtained from multiple segmented regression models is lacking. This analysis is important if one needs to compare the sequential order of breakpoints and test whether one breakpoint is significantly earlier than the other. To address this problem, we aim to develop a systematic method to identify breakpoints in multiple segmented regression models and list the breakpoints in a sequential order. We will also develop a statistical method to compare breakpoints from different segmented regression models.

2 Dataset

Simulated data will be used to test the validity of our methods. The methods will then be applied to a set of real stock market data. The data that will be included in this study is the end of day US stock prices (https://www.quandl.com/data/EOD?filterSelection=sample&keyword=)