Least Relative Error Estimation

by

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Abstract

Multiplicative regression model or accelerated failure time model, which becomes linear regression model after logarithmic transformation, is useful in analyzing data with positive responses, such as stock prices or life times, that are particularly common in economic/financial or biomedical studies. Least squares or least absolute deviation are among the most widely used criterions in statistical estimation for linear regression model. However, in many practical applications, especially in treating, for example, stock price data, the relative error, rather than the absolute error, is very often all what is concerned. This paper offers an alternative to the traditional estimation methods by considering minimizing the least relative error for multiplicative regression models. We prove consistency and asymptotic normality and provide an inference approach via random weighting. We also specify the error distribution, with which the proposed least relative error estimation is efficient. Supportive evidence is shown in simulation studies. Application is illustrated in an analysis of stock returns in Hong Kong Stock Exchange.

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