

Title: Construction of Prediction Intervals for the Multiplicative Holt-Winter's Method

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Degree: Master of Science in Statistics

Date: May 2006

Abstract:

The multiplicative Holt-Winters Exponential Smoothing Procedure is a useful procedure for forecasting. The point forecast is easily computed from a clearly defined equation. The interval forecast, on the other hand, is not easily computed since the standard error of forecast is not easily computed. The Root Mean Square Prediction Error (RMSPE) is commonly used in lieu of the standard error of forecast:

$(\mu_k \pm Z_{\alpha/2} \text{RMSPE})$

A prediction interval based on the bootstrap is proposed as alternative to the one using RMSPE. This addresses the non-normal distribution of forecast especially with non-linear models.

This prediction interval was evaluated using coverage probability. Results indicate that it performs well with clear trend and strong seasonality.