HOMOSCEDASTICITY AND HETEROSCEDASTICITY

Homoscedasticity refers to the assumption that the variance of error is constant across all the independent variables of regression model.

Purpose of homoscedasticity is to make sure that the predictions made by the model are reliable across the range of data indicating the spread of errors or noise are consistent. Many statistical tests like T-test used in regression analysis rely on the assumption of homoscedasticity. If it is violated we may get inaccurate p-values in T-test.

Homoscedasticity can be used in Linear Regression which is fundamental assumption for regression models using the least squares method. In Residual Analysis to examine the difference between predicted and actual values and check if they have consistent spread across all independent variables.

Heteroscedasticity refers to a situation where spread of variable is unequal across the range of values of another variable that predicts it. Error terms in regression model do not have a constant variance

Purpose of Heteroscedasticity is to ensure reliability and accuracy of statistical inference drawn from the model.

Homoscedasticity is preferred over Heteroscedasticity because, Homoscedasticity has constant variance, reliable hypothesis test, accurate prediction, while heteroscedasticity has non-constant variance, biased standard errors and unreliable predictions