Abstract

This study compares ways for improving regression calibration. This is a method for combining two samples in order to reduce measurement error and improve the relative efficiency of linear regression models. Since two or more samples are more likely than a single sample to accurately represent the population under study, two samples are used in regression calibration to produce a realistic picture of the actual population. In this investigation, we compared independent estimates derived from two samples using a weight equal to the reciprocal of the estimated sampling probability. The study also examined the estimations produced after combining the two datasets into one, and modified the weight of each sample unit accordingly. The most typical application of regression calibration methods is to account for bias in projected responses induced by measurement inaccuracies in variables. Because of its simplicity, this method is commonly utilized. The conditional expectation of the genuine response is estimated using regression calibration, given that the predictor variables are measured with error and the other covariates are assessed without error. Instead of the unknown genuine response, predictors are estimated and used to examine the link between response and result. Regression calibration programs necessitate extensive knowledge of unobservable true predictors. This information is frequently collected from validation studies that employ unbiased measurements of true predictors. The results of two sample strategies were employed and compared in this study. Device fault, laboratory mistake, human error, difficulty documenting or completing measurements, self-reported errors, and intrinsic vibrations of the underlying instrument can all cause measurement inaccuracies. Covariate measurement error has three consequences: In addition to obscuring data features and making graphical model analysis more difficult, estimates of statistical model parameters might be skewed, and effectiveness in detecting correlations between variables can be severely impaired. This study's two sampling procedures produced satisfactory results.