Applicability of the Ordinary Least Squares Procedure When Both Variables Are Subject to Error

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ABSTRACT

The problem of fitting a straight line when both variables are subject to error has received considerable attention in the literature. In a recent article, Mandel considered the ordinary least squares(OLS) procedure in this situation. Among others, he suggested that the "sensitivity of y with respect to x" be small for applicability of the OLS method. This paper examines the large-sample properties of the OLS slope estimator, and demonstrates that the "relative dispersion of the independent variable to its error variance" must be also considered in evaluating the performance of the OLS estimator. Further, the effect of refining or using more precise instrument on the bias and variance of the OLS estimator is also discussed.