

ESTIMATION OF TWO NORMAL MEANS WHICH MAY BE COMMON*

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(Received September 26, 1988; revised January 30, 1989)

Abstract. Consider the problem of estimating the mean of a normal population when independent samples from this as well as a second normal population are available. Pre-test estimators which combine the two sample means if a test of the hypothesis of equal population means accepts but otherwise use only the first sample mean, are compared to limited translation estimators which are derived in the spirit of Bickel (1984, *Ann. Statist.*, **12**, 864-879) (we also cover the cases of unknown variances). Our conclusion is that if the accuracy with which the second population mean can be estimated is of the same or better order of magnitude as the accuracy with which the first can be estimated, then the limited translation estimators largely dominate the pre-test estimators in terms of mean square error loss.

Key words and phrases: Common mean, Graybill-Deal estimator, pre-test estimator, limited translation estimator, problem P.