TOTAL LEAST-SQUARES ADJUSTMENT WITH PRIOR INFORMATION VS. THE PENALIZED LEAST-SQUARES APPROACH TO EIV-MODELS

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In the framework of a Gauss-Markov Model (GMM), it is well known that the Bayesian estimator, based on prior information, seems to coincide with the penalized least-squares estimator, based on Tykhonov regularization. However, their Mean Squared Error (MSE) matrices will be different, giving rise to a criterion that can determine the superiority of one over the other with respect to their MSE-risk. Here, a similar comparison will be undertaken within the framework of Errors-In-Variables (EIV) Models. An attempt will be made to determine the MSE-risk for both the Bayesian Total Least-Squares (TLS) estimator and the penalized TLS estimator, which should result in a generalized criterion for the superiority of one over the other.

Key Words: Total Least-Squares, Prior Information, Errors-In-Variables Modeling