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# Efficient Estimation in Models with Independence Restrictions

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## Abstract

Unconditional and conditional independence restrictions are used in many econometric models to identify their parameters. However, there are few results about efficient estimation procedures for finite-dimensional parameters under these independence restrictions. This paper computes the efficiency bound for finite-dimensional parameters under independence restrictions, and proposes an estimator that is consistent, asymptotically normal and which achieves the efficiency bound. The estimator is based on a growing number of zero-covariance conditions that are asymptotically equivalent to the independence restriction. The results are illustrated with examples, including an instrumental variables regression model and partially linear regression models. A small Monte Carlo study is performed to investigate the estimator's small sample properties and to quantify the efficiency gains that can be made by using the proposed efficient estimator.

**Keywords:** Efficiency Bounds, Independence, Estimation

**JEL Classification:** C13, C14

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