

## Iterative Estimation for Conditional Estimating Equations

Weiyu Li\*

Centre de Recherche en Economie et Statistique (CREST)  
Ecole Nationale de la Statistique et de l'Analyse de l'Information (Ensaï)  
Bruz, France [Weiyu.LI@ensai.fr](mailto:Weiyu.LI@ensai.fr)

Valentin Patilea

Centre de Recherche en Economie et Statistique (CREST)  
Ecole Nationale de la Statistique et de l'Analyse de l'Information (Ensaï)  
Bruz, France [patilea@ensai.fr](mailto:patilea@ensai.fr)

Many statistical and econometric models could be written under the form of conditional estimating equations, also called of conditional moment equations. In the classical approach for estimating parameters identified by such restrictions, one replaces the conditional moments by a sufficiently rich finite set of unconditional moments and applies the generalized method of moments (GMM). However, the GMM approach does not guarantee consistency since the parameters are not necessarily identified by a finite set of marginal moments. Motivated by this aspect, several recent articles proposed alternative approaches that preserve consistency. Herein we consider an estimation approach for conditional estimating equations that is called smooth minimum distance (SMD) and is based on the optimization of a nonlinear contrast. We introduce an iterative version of SMD based on a quadratic approximation of the contrast. At any step of the iteration, the estimate has an explicit form and therefore the new method could be easily implemented. We present an extensive empirical study of the new method. In particular we compare it with classical methods (least squares, maximum likelihood, GMM).

**Key Words:** conditional moment equations, Newton-Kantorovich method, quadratic forms