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### NBER COMPUTER RESEARCH CENTER NOTES

*The NBER Computer Research Center for Economics and Management Science has been engaged, since its formation in 1971, in developing new software systems for quantitative social science research. Prototype systems for exploratory data analysis, mathematical programming, and econometrics are now available. Following are abstracts of two recent working papers. The complete texts are available at \$1.00 per copy from the respective authors at: NBER Computer Research Center, 575 Technology Square, Cambridge, Massachusetts 02139.*

Belsley, D. A. and K. D. Wall, "Estimation of Econometric Models Using Nonlinear Full Information Maximum Likelihood: Preliminary Computer Results", BER Working Paper 142 (July 1976).

Preliminary results on the computational feasibility of nonlinear full information maximum likelihood (NLFIML) estimation are presented. Several of the NLFIML test cases were also subjected to nonlinear three-stage least square (NL3SLS) estimation in order to illustrate the relative performance of the two techniques. In addition, certain other aspects central to practical implementation are highlighted. These include the effect of various computers on the efficiency of the code, as well as the relative merits of numerical and analytical generation of gradient information. Broadly speaking, NLFIML appears competitive with NL3SLS in cost, and superior to NL3SLS in statistical properties.

Kaden, N. E. and V. Klema, "ROSEPACK Document 3: Guidelines for Writing for Semi-Portable FORTRAN", NBER Working Paper 130 (March 1976).

Transferring FORTRAN subroutines from one manufacturer's machine to another, or from one operating system to another, puts certain constraints on the construction of the FORTRAN statements that are used in the subroutines. The reliable performance of mathematical software should be unaffected by the host environment in which the software is used or by the compiler from which the code is generated. In short, the reliable performance of the algorithm is to be independent of the computing environment in which it is run.

The subroutines of ROSEPACK (*Robust Statistics Estimation Package*) are FORTRAN-IV source code designed to be semi-portable where semi-portable is defined to mean transportable with minimum change. This paper describes the guidelines by which ROSEPACK subroutines were written.