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Glossary of Econometric Terms

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Introduction

This paper prepqred by Mr. Samir Tobar includes definitions of the most important mathematical concepts currently utilized in Econometrics Literature. It is useful and valuable to have these definitions combined together in one paper which will be freauently. used by econometricians at our Institute. Mr. Samir promised to develop on this paper and prepare examples on each concept in a following paper.

Dr. Salib Rofael

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Glossary of Econometric Terms

Jointly dependent (endogenous) variables - A set of variables that are assumed to be determined simultaneously by common economic forces.

Independent (exogenous) variables - A set of variables that are assumed to affect endogenous variables but not to be affected by them.

Predetermined variables - The set of variables that includes the exogenous variables as well as the lagged values of endogenous variables in a system.

Mzz matrix - Moment matrix of the predetermined variables; must be positive definite.

Structural equations - Equations expressing the basic economic relationships that are assumed to exist in an economic model.

Error-in-equations model - The Structural equation system in which the error terms are the distrubances in the linear relations of the equations; measurement errors in the variables are thus disregarded.

Reduced-form equations - The equations derived by solving the structural equation system, either algebraically or numerically, for the dependent variables. Thus each reduced-form equation contains only one dependent variable and, in general, all the predetermined variables in the system.

Identification - (a) General: An equation is identified if its regression coefficients can be determined uniquely from the distribution of the dependent variables.

(b) Linear systems: An equation is identified if it is impossible to obtain, from linear combinations of the equations in the system, another equation containing the same variables as the given equation.

Alternatively, an equation is identified if there exists a unique transformation from (a subset of) the reduced form system to the given equation.

Necessary condition for identification - An equation is indentified if there are at least N-1 restrictions on its coefficients, where N is the number of dependent variables in the system. E.g., an identified equation has at least N-1 zero coefficients.

An underidentified equation has less than N-1 restrictions on its coefficients; a justidentified equation has exctly N-1 restricitions; an over-identified equation has more than N-1 restrictions.

Single-equation least squares - A rough estimation method that makes the (incorrect) assumption that the given equation contains only one dependent variable, the first variable in the equation, and uses least sequares to estimate the coefficients. This assumption is not used elsewhere.

Indirect least-squares method - An efficient estimation method for a just-identified equation: First estimate the relevant reduced-form regression coefficients by multiple linear regression; then derive the structural coefficients by applying the (unique) transformation to the reduced form equations.

Two-stage least-squares method - An estimation method for a single equation which regards the equation as being just-identified, even when it is over-identified. (For the "two-stage" interpretation see the write-up.) The estimates obtained by this method will change if the normalization in the equation is changed; this is not true of the methods mentioned below.

Limited-information method - A maximum likelihood estimation method which takes account of the over-identifying restrictions on the given equation(s), but implicitly treats the other equations of the system as just-identified. This method can be applied to one equation or to a subset of the system; in the latter case it is called the limited-information subsystem method.

Full-information method - A maximum likelihood estimation method which takes account of the over-identifying restrictions in the whole system.

Auto-correlation - Correlation between the observations on a variable and its observations lagged by a specified time interval. E.g., the auto-correlation co-efficient of lag 1 on T values of X is the correlation coefficient of $X_2 \ldots, X_T$ with $X_1 \ldots, X_{T-1}$.

Gradient method - An iterative method of maximization (minimization) which seeks out the direction of steepest ascent (descent), or gradient, at each iteration.