STaTa
Statistics/Data Analysis

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help for **diagref**   (Omar Lizardo)

Gaussian, Logit, Probit and Poisson Diagonal Reference models

Syntax

diagref *depvar rowvar colvar* [varlist] [*if*] [*in*],[,*options*]

options	description
model(*regression model*)	requests the kind of model to be fit
wcovars(*varlist*)	covariates associated with weight parameters p and q
tech(*maximization technique*)	maximization algorithm

Description

   diagref Fits gaussian, logit and poisson regression models that incorporate Sobel's (1981) non-linear parameterization of "status inconsistency" effects for two identically coded independent variables R and C (Sobel refers to these models as "diagonal reference models"). The model is estimated via a maximum likelihood regression of *depvar* against *rowvar* and *colvar* and an optional vector of control variables. Where *rowvar* and *colvar* are identically coded categorical row and column factors respectively. The user can request a regression model appropriate for either normally distributed (gaussian), binary (probit or logit) and count (Poisson) dependent variables. In addition the user may specify that the p and q parameters be a linear function of an exogenous variable. This is a generalization of the diagonal reference specification first developed in Sorenson (1989). Hendrickx, de Graaf, Lammers and Ultee (1993) provide further substantive extensions and theoretical developments related to these class of models.

Parameterization

   The Sobel parameterization of "status inconsistency" effects for two identically coded "status" factors R and C with categories i=(1,2,..R) and j=(1,2,...C) respectively is:

   $Y[ij] = U[ij] + e$

with:

   $U[ij] = p*U[ii] + q*U[jj]$

and the restriction:

   $q = (1-p)$

The nonlinear product term p provides an estimate of the "weight" of factor in determining the outcome and q provides the (constrained to be proportional) weight of factor C.

Hendrickx et al (1993: 342) restate Sobel's parameterization of the mean effect of variables R and C (U[ij]) as:

   $U[ij] = a + p*v[i] + q*v[j]$

With the restriction that the sum of all of the v[i] is equal to zero and v[i]=v[j] for all i=j. This is the model that is estimated by this program.

This program is only capable of estimating the "simple" version of Sobel´s diagonal reference model which constrains the p and q parameters to be the same for all row and column categories. Sobel (1981) extended this simple model by allowing for separate p[i] parameters for each row category and/or separate q[j] parameters for each column category.

This program however is capable of estimating a different sort of "generalization" of both the Sobel (1981) and the Hendrickx et al (1993) models by allowing the user to specify that the parameters p and q be themselves a linear function of an exogenous covariate. This is the generalization of Sobel's diagonal reference model developed by Sorenson (1989: 128, equations 7-9). This provides a simple and more powerful way to estimate a "heterogeneous" row and column weight model (see Weakliem [1992] for another approach), by allowing the heterogeneity to be function of observation-level characteristics. This can be done by specifying the *wcovar* option.

This last model is as the one shown above but with the stipulation that:

$$U[ij]=a+(p+p[l]X)*v[i]+(q+q[l]X)*v[j]$$

Where X is the exogenous covariate, and p[l] and q[l] represent the effect of X on the relative influence of each weight parameter. This model has the following restrictions:

$$p[l]+q[l]=0$$

and:

$$p+p[l]+q+q[l]=1$$

Options

Model fitting
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model(*regression model***)** Specifies the type of regression model to be fit, depending on the distribution of the outcome variable. If this option is not specified the program fits a linear (gaussian) regression model by default. Allowable models are:

gaussian requests a linear regression model(default).

logit requests a binary logit model.

probit requests a binary probit model.

poisson requests a Poisson regression model (appropriate for count outcomes).

Generalized Diagonal Reference models
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wcovars(*varlist***)** this option is used to make the weight parameters related to the row and column factors (p and q) themselves be a linear function of an exogenous covariate. It is recommended that the user center continuous variables when they are included as predictors of the weight parameters.

Other options
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tech(*maximization technique***)** because these models are nonlinear in the parameters, maximization may sometimes be difficult. When convergence fails to happen, the user is advised to experiment with different combinations of maximization techniques (see maximize for details).

Getting the Program
To get the program, type the following from the Stata command line:

        net from http://www.nd.edu/~olizardo/Stataprogs/diagref/

Click on "diagref" in the results window and then click on the installation link on the viewer screen

References

Hendrickx, John, Nan Dirk de Graaf, Jan Lammers and Wout Ultee. 1992. "Models for Status Inconsistency and Mobility: a Comparison of the Approaches by Hope and Sobel with the Mainstream Square Additive Model." *Quality and Quantity* 27: 335-352.

Sobel, Michael E. 1981. "Diagonal Mobility Models: A Substantively Motivated Class of Designs for the Analysis of Mobility Effects." *American Sociological Review* 46: 893-906.

Sorenson, Ann Marie. 1989. "Husbands' and Wives' Characteristics and Fertility Decisions: A Diagonal Mobility Model." *Demography* 26: 125-135.

Weakliem, David L. 1992. "Does Social Mobility Affect Political Behaviour?" *European Sociological Review* 8: 153-165.