

SAS/ETS® 12.1 Software

Econometrics and Time Series Methods for Modeling and Forecasting

Overview

SAS/ETS 12.1 introduces many new estimation features, including Bayesian options, new variable selection methods, a new data access engine, and many enhancements to existing procedures. SAS/ETS has also developed *p*-values that are based on accurate high-performance simulation methods for many popular test statistics in the AUTOREG and PANEL procedures.

Bayesian Estimation in QLIM

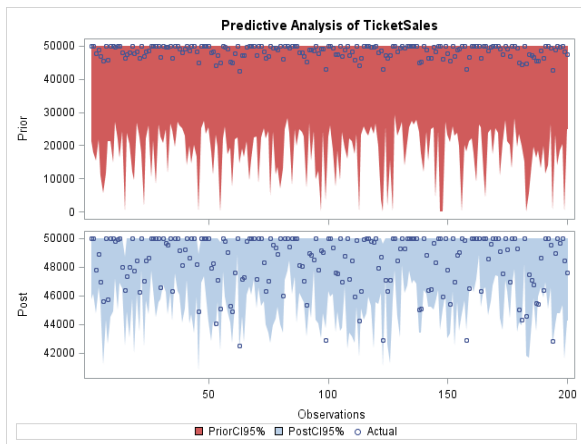
PROC QLIM now provides Bayesian estimation methods for most univariate models that are supported by the procedure. The QLIM procedure enables you to estimate models of limited dependent variables such as:

- logit/probit
- ordered logit/probit
- stochastic frontier
- truncated regression
- censored regression

You can now use Bayesian methods to estimate these models.

The main features include:

- choosing prior distributions
- tools to initialize and tune the MCMC algorithm
- multithreaded Metropolis sampling
- convergence diagnostic tools such as:
 - Raftery-Lewis
 - Heidelberger-Welch
 - Geweke
 - effective sample size
- prior and posterior predictive analysis



HAC Covariance Estimators

The PANEL and AUTOREG procedures now offer convenient options to produce variance-covariance matrices for estimates in the presence of heteroscedasticity or autocorrelation (or both) of unknown form. The heteroscedasticity- and autocorrelation-consistent (HAC) options support the following five types of kernel functions:

- Bartlett
- Parzen
- quadratic spectral
- truncated
- Tukey-Hanning

You can assign or estimate the bandwidth parameter with the Andrews method, Newey-West method, and sample size method. The HAC options also contain a prewhitening routine. A convenient HAC option, COVEST=NEWKEYWEST, enables you to quickly specify the Newey-West standard errors that are presented in Stock and Watson (2002).

Variable Selection Algorithms

The COUNTREG and QLIM procedures now support the greedy search method of variable selection. In each step, the procedure evaluates Akaike's information criterion (AIC) or Schwartz Bayesian criterion (SBC) and continues until the selection criterion is met. You can use either forward or backward selection in the greedy search algorithm.

SEATS Method in X12

The X12 procedure, which is popular for deseasonalizing data that are based on the U.S. Census Bureau's X12 program, has been updated to include the SEATS decomposition method. SEATS is a polynomial-based seasonal decomposition method that extracts trend, seasonal, irregular, and cyclical factors from ARIMA models. You can use the SEATSDECOMP statement to save the signal-adjusted time series in a SAS data set.

The SASEXFS Interface Engine

SAS/ETS 12.1 provides a new data access engine for FactSet data, which are provided by the FactSet FASTFetch Web service. This service provides access to a number of data libraries from economic and financial data sources, such as Compustat, Dun and Bradstreet Corporation, FactSet, and others.

New Specification Tests

A variety of new model specification tests have been added to the PANEL and AUTOREG procedures. These tests check the models' statistical assumptions about stationarity, cointegration, and structural change, and they include p -values that are generated by high performance simulation methods.

The AUTOREG procedure now supports these new test statistics:

- multiple structural change tests proposed by Bai and Perron with simulated p -values (1998)
- Shin cointegration test with simulated p -values
- simulated p -values for ERS, ERS DF-GLS and KPSS unit root tests

The PANEL procedure supports these new test statistics for panel data models:

- Breitung's unbiased tests (1994, 2000, 2005)
- Hadri's stationarity test (2000)
- Harris and Tzavalis test (1999)
- Im, Pesaran, and Shin test with simulated p -values (2003)
- Levin, Lin, and Chu test (2002)
- Maddala and Wu (1999) and Choi (2006) combination tests
- poolability tests

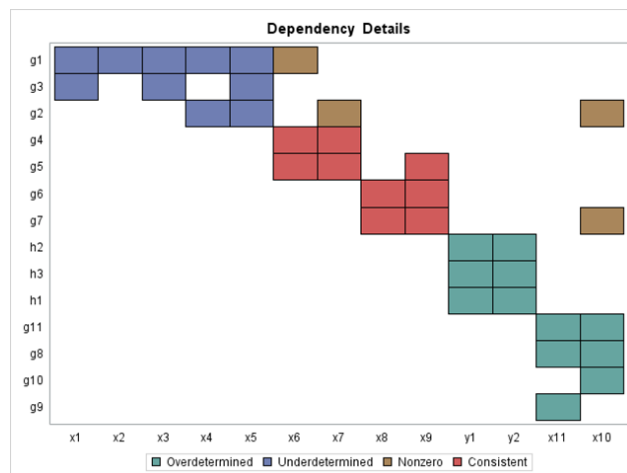
New ODS Graphics

Many new plots have been included with SAS/ETS 12.1, including:

- Predictive and diagnostic plots for PROC COUNTREG
- Predictive and diagnostic plots for PROC QLIM, including Bayesian plots
- Q-Q plot for PROC SEVERITY
- Residual and structural break analysis in PROC SSM
- Dependency plots in PROC MODEL

Other Enhancements to SAS/ETS

The QLIM procedure now supports the Heckman two-step estimator for sample selection models. This is an alternative to the maximum likelihood estimates that already exist in the procedure.



The consistent standard errors for this two-step estimator are automatically generated for the second-stage OLS parameter estimates.

The SEVERITY procedure has been modified so that estimation algorithms execute in parallel, thereby taking advantage of all CPU cores available during estimation. The SEVERITY procedure also has been enhanced to provide standard errors and confidence intervals for empirical distribution function (EDF) estimates. PROC SEVERITY also now supports regressors through its SCALEMODEL statement, allowing explanatory variables to scale the fitted distribution.

The MODEL procedure has a number of enhancements to improve simulation. The OPTIMIZE option has been added to the SOLVE statement to permit the simulation of models that include constraints on the solve variables in PROC MODEL's systems of equations. Options also exist to place bounds and restrictions on these solve variables. PROC MODEL has a new REPORTMISSINGS option that helps to debug problems that are associated with missing data in FIT and SOLVE statements. The ANALYZEDEP option produces information about the nature of misspecification errors in simulations. New copula options have also been added that can be used with the simulation features in PROC MODEL.

The COUNTREG procedure now supports multiple MODEL statements.

For More Information

SAS/ETS 12.1 was released in August, 2012. See the details at www.support.sas.com/statistics/.