

Latest Release: SAS/ETS® 13.1 Software

Econometric and time series methods for modeling and forecasting

Overview

SAS/ETS 13.1 introduces many new estimation features, including Bayesian options, limited dependent models with endogenous regressors, compound distribution models, a new data access engine, and many other enhancements. SAS/ETS has also refactored its vector autoregressive procedure, the VARMAX procedure. This procedure now estimates parameters at far greater speeds and with more precision than ever before.

Multivariate Bayesian Estimation

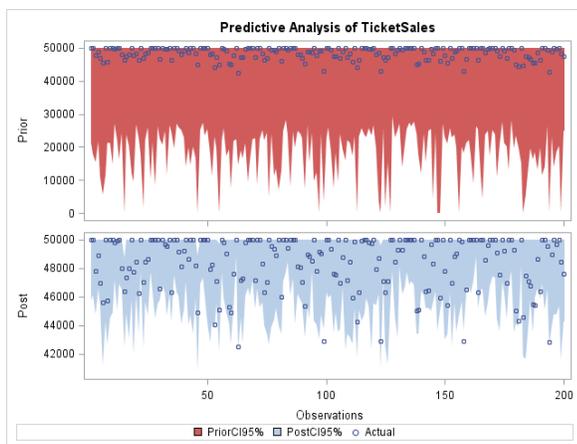
The QLIM procedure provides users with Bayesian estimation methods for all models that the procedure supports. PROC QLIM enables users to estimate models of limited dependent variables such as:

- logit/probit
- ordered logit/probit
- stochastic frontier and cost models
- truncated/censored regression
- sample selection
- multivariate limited dependent models

You can now use Bayesian methods to estimate these models.

The main features of the Bayesian methods include the following:

- choice of prior distributions
- tools to initialize and tune the MCMC algorithm
- multithreaded Metropolis sampling
- convergence diagnostic tools such as Raftery-Lewis, Heidelberger-Welch, and Geweke
- prior and posterior predictive analysis



Limited Dependent Variable Models with Endogenous Regressors

The QLIM procedure now supports full information maximum likelihood (FIML) estimates for structural models that include endogenous regressors. These endogenous regressors can be continuous, discrete, censored, or truncated. Among these estimable models are the following:

- probit/logit
- ordered probit/logit
- Tobit
- stochastic frontier
- sample selection

The QLIM procedure also supports a variety of endogeneity and overidentification tests that use these new FIML estimates.

FRED Interface Engine

Federal Reserve Economic Data (FRED) can now be accessed from a new SAS/ETS access engine utility. This utility conveniently enables you to dynamically query the most up-to-date information from the FRED database and include these data to enrich and enhance your models.

Multivariate Time Series Models

PROC VARMAX now estimates two new variants of multivariate GARCH models, known as GARCH-DCC and GARCH-CCC, and its internal infrastructure has been improved. In many cases, these new improvements enable more complex models to be estimated more quickly and with greater precision than ever before. These improvements enable you to put more complicated models into production.

Conway-Maxwell-Poisson Model

The COUNTREG procedure now supports the Conway-Maxwell-Poisson (CMP) model, which provides greater flexibility by allowing the scale parameter to be a function of regressors. The CMP allows for over- or underdispersion of outcomes, which ordinary Poisson models would constrain. The CMP regression model can also be estimated with zero-inflated models.

Compound Distribution Models

SAS/ETS 13.1 includes a new procedure for simulating compound distribution models (CDM): the HPCDM procedure enables you to simulate aggregate loss distribution models, which are useful in assessing operational risk and defining appropriate capital requirements in situations in which rare but catastrophic events occur. The HPCDM procedure combines results of two other SAS/ETS procedures, the COUNTREG and SEVERITY procedures, giving the modeler extreme flexibility with which to model the number of events and size of losses. This flexibility can take the form of both distributional assumptions on the loss and count data models and different regressors in each model. The HPCDM procedure includes the following features:

- simulation of aggregate loss models
- what-if analysis
- parallelized simulation that takes advantage of multicore machines
- ODS output for visual inspection of results

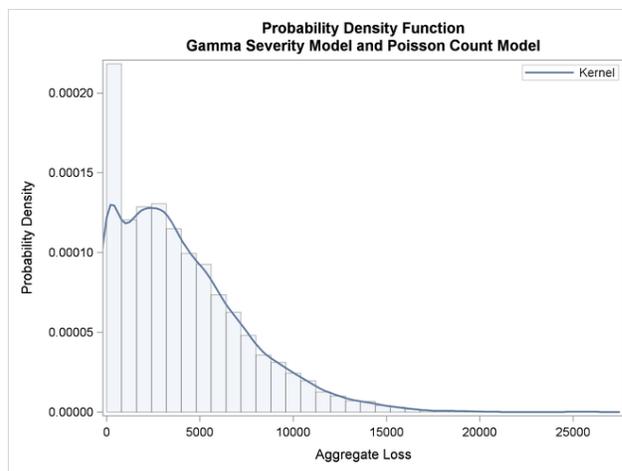
Panel and Time Series Tests

A variety of new model specification tests have been added to the PANEL and AUTOREG procedures. These tests check the statistical assumptions of the models concerning stationarity, cointegration, and structural change, and they include p -values that are generated by high-performance simulation methods. Many software packages report only selected critical values for these tests. The AUTOREG procedure now supports the following new test statistics:

- multiple structural change tests that are 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

For panel data models, the PANEL procedure supports these new test statistics:

- 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



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

The SEVERITY and HPSEVERITY procedures now support a new OUTSCORELIB statement to create scoring functions, which help simplify the computation of distribution functions with fitted parameter estimates. This eliminates the need of writing a complex DATA step that reads the estimates from the OUTEST= data set. Both procedures also now support a new OFFSET= option in the SCALEMODEL statement to model the scale parameter per unit which is a measure of exposure.

The COUNTREG procedure now supports the STORE and enhanced CLASS statements. The STORE statement enables previously estimated models to be used for out-of-sample prediction and other post-estimation routines. The procedure is also multithreaded for faster computation.

The system GMM estimator proposed by Blundell and Bond for dynamic panel models is now available in the PANEL procedure.

For More Information

For more information, ask your organization's SAS representative to contact the SAS Customer Interaction Center at 1.800.727.0025.