The RATSletter

RATS Version 8

We are pleased to announce the release of Version 8 of RATS. Users with current update subscriptions will receive RATS 8.0 automatically. If you don't have a subscription, you can update to version 8 for $150 (for single-user licenses). If you have the standard version and would like to take advantage of the additional features offered in the Professional version, you can upgrade to RATS Pro for $300. For more information, please visit our website at *www.estima.com*, email us at *sales@estima.com*, or call 800-822-8038.

What's New in Version 8?

A new look, new manuals, improved data handling, more powerful tools for organizing results, and much more—here's a look at some of the key improvements in RATS 8.

Revised Manuals

The manuals have been completely revised, incorporating all of the changes and new features added since version 7.0. The biggest change is the new *Introduction* book. This is a 180 page book which uses six short examples to demonstrate how RATS works, introducing the various window types, many of the wizards, and the data handling features.

Each example is followed by several "Learn More" sections. These sections can help both new and experienced users get the most out of RATS, but they can also be skipped initially by users who are eager to get started with their own projects.

We've also reorganized the *User's Guide*, which now features more than double the coverage of state space models and DSGEs, and a new chapter on switching models and structural breaks, including descriptions of the Bai-Perron procedure, TAR and STAR models, rolling regressions, and a much-improved discussion of mixture and Markov switching models. The chapters on Vector Autoregressions and on Simulations and Bootstrapping have been expanded and rewritten to include some of the new ideas and procedures introduced in the *VAR* and *Bayesian Methods* e-courses.

The set of three manuals is much more extensively cross-referenced, particularly in their PDF form.

Interface Improvements

New operations on the *View* menu provide quick access to information on data series. We've redesigned the toolbar icons for a more standardized appearance, and added many new toolbar operations.

Many of the wizard dialog boxes have new features and are easier to use—the ARCH/GARCH and regression wizards in particular.

New preference choices give you more control over the way Input and Output windows are configured when you start the program.

Data Management Features

Making it as easy as possible to get data into the program was a major focus in developing RATS 8.

You'll find support for more data file formats, including Stata®, EViews®, and MATLAB®. Support for Excel® 2007 was added with 7.3.

RATS 8 also offers greatly increased flexibility for reading spreadsheet files, including the ability to isolate a block of data from other information on the file.

The *Data Wizard* is much improved, making it easier to set various options. We introduced the ability to preview the contents of a data file in version 7.3. With version 8, you can set a target frequency and starting date that differ from those of the source file. This allows you to read in only a subset of the data, or compact or expand the data to a different frequency. Previously, this required setting the `CALENDAR` instruction manually—now you can do it directly through the Wizard.

Other "point-and-click" enhancements:

- You can now drag-and drop series from a RATS format file onto the Series Window.

- The Series Edit Window now supports copying and pasting data. If you need to get data from a web site or PDF file, you can now just copy the data from the source and paste it into a new series window.

The `READ` and `WRITE` instructions (for reading and writing scalars, arrays, and text data) also support a much wider set of data formats, including XLS, XLSX, WKS and MATLAB.

Improved Reports

The reports produced by RATS instructions or procedures can now be reformatted on screen to change the displayed precision. From this, you can export or copy-and-paste in a number of formats.

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Reports, *continued*

Almost all of the output generated by RATS instructions, such as tables of regression coefficients, can now be reloaded into these report windows.

Interface with TeX

Reports can now be exported as a TeX tabular, with the proper escapes for special characters. In addition to exporting, there is a *Copy as TeX* operation which copies the tabular environment code into the clipboard for pasting in a TeX editor.

If you construct a report using the `REPORT` instruction, you can surround TeX expressions in `$..$` to include mathematical expressions in the table. So a field in the report "`$\phi ^d = \phi ^b = 0$`" will display (when exported to TeX) as $\phi^d = \phi^b = 0$

Revised Procedures

We've revised most of the procedures supplied with RATS to take advantage of the new report features. They now save output as "titled" reports, which can be easily recalled for viewing, exporting, or copying and pasting, using the *Report Windows* operation.

Programming Features

The ability to define structures like "arrays of arrays" and "arrays of series" has long been a powerful feature in RATS. Now you can define much more complex nested structures, such as "arrays of arrays of arrays" or "arrays of series of arrays". Also, the `%IF` function now accepts a much wider variety of argument types.

New Functions

We have added thirty-one new built-in functions since version 7.0. Many of these are for probability density and distribution functions. Others provide new ways of generating random draws, working with equations, performing matrix operations, and more.

New DUMMY Instruction

Generates standard dummy, trading day, calendar, and intervention variables.

GARCH Models

Adds `VARIANCES=SPILLOVER` as an option for the univariate variance model in a CC or DCC model.

Graphics

The `BACKGROUND` option on **GRPARM** allows you to select the background color for the main graph box, while the `RGF` option on **SPGRAPH** allows you to insert an existing graph file into a matrix of graphs.

Graphs are now titled using either their header or footer (if available), making it easier to locate a particular window among a large number of graphs.

Using an Older Version?

As you can see, we've made many of improvements since version 7.3 was released in February of 2010. If you are still using something older than 7.3, you'll find even more to like in the new release. Key features added since version 7.0 include:

Much Faster Computations

Thanks to careful code optimization, we have significantly reduced the time required for many computations. Some complex estimation tasks now run up to twice as fast as before.

More Menu-driven Wizards

New point-and-click wizards for Unit Root Tests, Recursive Least Squares, Nonparametric Regressions, and Kernel Density Estimation.

DLM and DSGE Instructions

Extensive improvements to the state-space modelling instructions, including new options and improvements to the internal computations.

X11 and BOXJENK, Census ARIMA-X12

Extensions to the **X11** and **BOXJENK** instructions in the Pro version allow you to implement most features of the Census Bureau's X12-ARIMA seasonal adjustment technique.

Improved Reports

Reports are now handled as user-accessible variables of type `REPORT`, and you can generate and maintain multiple reports at a time with the `USE` option. Reports can be defined as local variables in procedures and functions.

Data Handling (Professional Versions)

Expanded ODBC/SQL support—you can now provide SQL queries on a separate file (useful for longer, more complex queries).

RATS Pro provides point-and-click access to the FRED® (Federal Reserve Economic Data) database provided by the St. Louis Federal Reserve Bank.

Graphics

The **GBOX** instruction draws box plots (also known as box and whisker plots). You can include line breaks in graph labels such as headers and subheaders.

GRTEXT adds a `DIRECTION` option for positioning text by specifying a compass heading direction from the (x,y) point, and the `TRANSPARENT` option for making the backgrounds of labels transparent

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DISPLAY

The DELIMITED option gives you more control over output. By default, **DISPLAY** separates output with blank spaces, but you can use DELIMITED to generate tab, comma, or semicolon-delimited output instead. This works when outputting to the screen, but is most useful when using the UNIT option to output text to file. Also, you can now **DISPLAY** the contents of parameter sets and equations.

Panel Data

The **PREG** instruction adds an additional choice on the METHOD option for pooled panel regression.

Stepwise Regressions

STWISE now has a GTOS choice for the METHOD option (for General TO Specific) which drops regressors, in order, starting from the end of the supplementary card list. This can be used to do automatic pruning of lags in an autoregression.

New Classroom RATS

We will continue to offer our Classroom version of rats at extremely affordable pricing. As in the past, the Classroom version includes all the features of the Standard version, but will only run for one year from the date of first use.

Beginning with Version 8, we will ship Windows and Macintosh versions on a single CD, so professors or bookstores placing orders will not need to worry about which platform students are using.

New Extension (RPF) for Program Files

For many years now, we have used .PRG (short for PRoGram) as the extension for RATS program files. Unfortunately, PRG is used by many other applications as well, and, due to security concerns, many email systems now block any messages that include .PRG attachments.

This has become a major problem for RATS users trying to share code with each other, and for us in trying to email example programs to our users.

So, beginning with version 8, we are using .RPF (for Rats Program File) as the preferred extension for RATS program files. When you do *File–Open*, the program will default to showing both .RPF and .PRG files in the dialog box, so you can still find old files easily. However, we recommend that you use .RPF for any new programs.

The file format hasn't changed—RATS still uses simple text format files for programs and procedures. Only the preferred extension has changed.

New Examples and Procedures

New Replications and Examples

Greene's *Econometric Analysis*, 6th Edition
RATS 8 includes updated example programs for this new edition of Greene's popular text.

Lutkepohl's *New Intro. to Multiple TIme Series Analysis*
Example programs covering VARs, ARCH/GARCH, state space, and related models.

ADSJBES2009.zip
State-space model with mixed frequencies from Aruoba, Diebold and Scotti (2009), "Real-Time Measurement of Business Conditions," *JBES*.

BalkeFombyIER1997.zip
Threshold cointegration estimation from Balke and Fomby (1997), "Threshold Cointegration," *International Economic Review*.

CassKoopmans.rpf
Solves Cass-Koopmans growth model.

GrangerBootstrap.rpf
Bootstrapping applied to Granger causality test.

Hansen_IER1994.zip
GARCH models with time-varying t and skew-t densities from Bruce Hansen (1994), "Autoregressive Conditional Density Estimation", *International Economic Review*.

Hansen_JOE2000.zip
Structural break test with fixed regressor bootstrap from Hansen (2000), "Testing for Structural Change in Conditional Models", *J. of Econometrics*.

JPRJBES1994.zip
Bayesian estimation of a stochastic volatility model from Jacquier, Polson and Rossi (1994), "Bayesian Analysis of Stochastic Volatility Models", *JBES*.

Lanne_Lutkepohl_JMCB2008.zip
Structural VAR with volatility shifts from Lanne and Lutkepohl (2008), "Identifying Monetary Policy Shocks via Changes in Volatility", *JMCB*.

LubikSchorfheideJME2007.rpf
Model from Lubik, Thomas A. & Schorfheide, Frank, 2007. "Do Central Banks Respond to Exchange Rate Movements? A Structural Investigation," *Journal of Monetary Economics*.

Mark_Sul_OBES2003.zip
Panel DOLS estimation from Mark and Sul (2003), "Cointegration Vector Estimation by Panel DOLS and Long-run Money Demand," *Oxford Bulletin of Economics and Statistics*.

RATS Web Course Materials

As you may know, we have been running several web-based econometrics courses over the past couple of years. If you missed a course, you can still purchase the course materials for just $50. Each set of course materials includes a PDF workbook with all of the lessons and examples from the course, plus copies of the example program files, data sets, and procedures. The materials are normally delivered by email (as a Zip file), although we can provide them on disk on request.

See below for a list of course. See:

www.estima.com/courses_completed.shtml

for more details on each. You can order these online, or by phone or email.

Bayesian Econometrics
The course covers many important methods, including Gibbs sampling, Metropolis-Hastings and importance sampling, with applications to a broad range of topics, include time series, cross-section and panel data. The presentation is based largely on Gary Koop's *Bayesian Econometrics* (available from Estima), but also covers additional topics.

State Space and DSGE Models
The "State Space" portion is based largely on Durbin and Koopman's *Time Series Analysis by State Space Methods* book, supplemented by material from Harvey's *Forecasting, Structural Time Series Models and the Kalman Filter*, and from West and Harrison's *Bayesian Forecasting and Dynamic Models*. The DSGE (Dynamic Stochastic General Equilibrium) portion covers basic concepts of formulating and estimating these models, and presents selected examples from the literature.

We recommend that participants have the Durbin and Koopman book (available through Estima).

Vector Autoregression Models
This course focuses on the "flat prior" types of analysis (informative BVAR's in a future course on forecasting). Topics include parametric SVAR's, sign-restrictions, short-and-long run restrictions, factor augmented VAR's.

Structural Breaks and Switching Models
This course is still running as of this writing, but the course materials will be available shortly after it is completed. The course covers a range of topics including outlier detection, intervention modeling in various models, tests for structural breaks and threshold effects, estimation of threshold and smooth transition models and endogenous Markov switching models. It includes both maximum likelihood and Bayesian estimation techniques.

Examples and Procedures, *continued*

MichaelNobayPeelJPE1997.zip
Estimation of ESTAR models from Michael, Nobay and Peel (1997), "Transactions Costs and Nonlinear Adjustment in Real Exchange Rates: An Empirical Investigation", *J. of Political Economy*.

OzbekOzlale_JEDC_2005.zip
State space model with time-varying coefficients from Ozbek and Ozlale (2005), "Employing the Extended Kalman Filter in Measuring the Output Gap," *Journal of Economic Dynamics and Control*.

New Procedures

APGradientTest
Andrews-Ploberger break test for GARCH models or maximum likelihood.

BDIndTests
Battery of independence tests.

CSeriesSymm
Complex series symmetrizer.

Hadri
Hadri test for unit roots in panel data.

HTUnit
Harris-Tzavalis unit root test for panel data.

InvGammaParms
Computes inverse gamma distribution parameters.

KSCPostDraw
Draws from posterior density needed in stochastic volatility model.

LogMVSkewt
Function for log density of multivariate skew-t.

LogMormalParms
Computes parameters for log normal distribution.

LsdVc
Estimates dynamic FE model with bias correction.

Perronbreaks
Compute various unit root tests with breaks.

RegHBreak
Structural break test with bootstrapped p-values.

RollReg
Computes rolling regressions for least squares.

UniqueValues
Extracts unique values from a series.

VARFromDLM
extracts a VAR representation from a state space model.