

RATS 6

Easier to use. Even more powerful.

RATS provides all the basics, including linear and non-linear least squares, forecasting, and ARIMA models, and goes far that to provide full support for GMM, ARCH and GARCH, general maximum likelihood estimation, vector autoregressions, spectral analysis, and much more.

It can handle time series of virtually any frequency, including daily and weekly, as well as panel data, and produces publication-quality graphs for printing or importing directly into word processors.

Menu-driven “Wizards” provide a “point and click” interface for many common tasks, making RATS an ideal tool for new users and for educational settings. Meanwhile, the powerful command-driven language at the heart of the program remains easy to learn and use for simple jobs, while also allowing users to automate complex or repetitive tasks and write sophisticated interactive programs.

Major Improvements Since 5.0 Include:

- Menu-driven “Wizards” for reading data, generating statistics, graphing data, estimating OLS, VAR, and ARIMA models, hypothesis testing, and accessing the built-in functions
- New built-in GARCH instruction for estimating a wide variety of univariate and multivariate ARCH/GARCH models. Multivariate models supported include BEKK, diagonal, Constant Correlation, and Dynamic Conditional Correlations.
- FUNCTION instruction for user-defined callable functions
- New DDV and LDV instructions for discrete and limited dependent variable models (logit, probit, multinomial conditional logit, censored or truncated data)
- GCONTOUR instruction for contour graphs
- NPREG instruction for non-parametric regressions
- RLS instruction for recursive least squares
- RREG instruction for robust regressions, including LAD and quantile regression
- MCOV instruction expanded to handle multi-equation computations
- REPORT instruction for easily and accurately generating reports from results
- DBOX instruction for creating user-defined dialog-boxes
- Features of RATSDATA program now incorporated directly into RATS
- More than 75 new built-in functions for matrix and string operations, handling regressor and instrument lists, polynomials, random draws and resampling, and more.
- Significant improvements to the non-linear estimation algorithms

RATS is available for Windows, Macintosh, UNIX and Linux systems. Student discounts are available. We also offer network licenses and a limited “Classroom” version for instructional settings. For more information, please visit our web site at:



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RATS Version 6 Features

Statistical Methods

Estimation Techniques

- Multiple regressions including stepwise
- Regression with autoregressive errors
- Heteroscedasticity/serial-correlation correction, including Newey-West
- Non-linear least squares
- Two-stage least squares for linear, non-linear, & autocorrelated models
- ARCH and GARCH estimation (univariate and multivariate)
- Seemingly unrelated regressions and three-stage least squares
- Non-linear systems estimation
- Generalized Method of Moments
- Maximum likelihood estimation
- Constrained optimization
- Built-in hypothesis testing
- Logit and probit models
- Censored/truncated data
- Fixed/random effects estimators
- Non-parametric regressions
- Kernel density estimation
- Robust estimation
- Recursive least squares
- State-space models
- Neural network models
- Linear and quadratic programming

Time Series Procedures

- ARIMA models including multiplicative seasonal models, with support for arbitrary lag structures.
- Transfer function/intervention models
- Vector autoregressions, including structural VAR's
- Impulse responses, variance decompositions
- Error correction models
- Kalman filter
- Spectral analysis

Forecasting

- Time series models
- Regression models
- Exponential smoothing
- Simultaneous equation models (unlimited number of equations)
- Simulations with random or user-supplied shocks
- Forecast performance statistics

Working With Data

Graphics

- High-quality time series graphics
- High-resolution X-Y scatter plots
- Dual-scale graphs
- Contour graphs
- Copy-and-paste graphs into other applications
- Export graphs to many formats, including PostScript and WMF

Data Entry

- Menu-driven "Data Wizard" for reading in data
- Reads and writes Excel, WKS, ASCII, DIF, PRN, DBF, Haver, and other data files
- On-screen data editor
- Can handle virtually any data frequency, including daily, weekly, intra-day, and panel data
- RATS data file format is fast and easy, supports all frequencies, and allows you to store series of different frequencies on the same file
- Easy to convert data to different frequencies

Data Transformations

- Flexible transformations with algebraic formulas
- Easy to create trend series, seasonal, and time period dummies
- Specialized differencing and filtering operations

Programmability

Programmable Interface

- Extensive looping capabilities and support for applying operations to lists of variables make it possible to automate many repetitive tasks.
- You can write *procedures*, which can perform complex tasks with a single instruction, and write your own callable functions.
- A library of procedures written by RATS users from around the world is available free of charge on our web site.
- A variety of interface-related instructions allow you to create your own drop-down menus, custom dialog boxes, and more.

Supported Platforms

RATS for Windows and Macintosh

- WinRATS—runs on Windows 95/98/ME, NT, 2000, XP, and later
- MacRATS—any Mac running OS X 10.4 or later

RATS for UNIX and Linux

- RATS is available for almost all UNIX and Linux systems.

Optional Add-ons

CATS Cointegration Analysis

- Powerful, menu-driven cointegration analysis and testing procedure for RATS. Developed by the originators of the Johansen methodology.

X11 Seasonal Adjustment, More Database Support

The Professional versions of RATS add the following (where applicable):

- Census Bureau X11 seasonal adjustment routine
- Support for FAME data files
- Support for CRSP data files
- Support for reading databases via ODBC/SQL

Licensing Details

- Software is purchased, not leased, so no need to pay annual fees to continue using the program.
- Contact Estima for information on network licenses, volume discounts, and classroom licenses.

System Requirements

Windows System Requirements

- Pentium-based or better PC
- Hard drive with at least 90Mb free
- CD Rom drive

Macintosh System Requirements

- Any PowerPC- or Intel-based Mac running OS X 10.4 or later
- Hard drive with at least 90Mb free
- CD Rom drive

UNIX/Linux Workstation Versions

- UNIX, Linux, or UNIX-based operating system
- CD Rom drive
- ANSI-standard C/C++ compiler
- X Windows and Motif libraries required for interactive mode use

Cointegration, Seasonal Adjustment, and More

CATS 2.0 Cointegration Procedure

CATS (Cointegration Analysis of Time Series) is a sophisticated set of RATS procedures which implement the popular Johansen and Juselius cointegration analysis techniques. Version 2.0 was written by Jonathan Dennis, Katarina Juselius, Soren Johansen, and Henrik Hansen of the University of Copenhagen, and is distributed and supported by Estima.

CATS is almost entirely a menu and dialog-driven procedure. You use standard RATS instructions to define the frequency, read in data, do any necessary transformations, and then “source” in and execute the CATS procedures. From there, the rest of the analysis is done by selecting operations from the CATS pull-down menus, and entering information in pop-up dialog boxes.

The Johansen–Juselius approach to cointegration is based on the error-correction form of a Gaussian vector autoregression. In particular, they analyze the decomposition of the matrix of error-correction coefficients Π into $\alpha\beta'$. The I(1) procedure supports partial systems, and makes it easy to specify weakly exogenous variables. You can also include dummy variables, or stationary dummy-type variables.

To help you choose a model, CATS provides eigenvalues, trace and lambda-max test statistics for reduced rank (and 90% critical values if requested) and unrestricted estimates of α , β , and Π . You can check the model by calculating multivariate test statistics for residual autocorrelation, normality, and ARCH. Version 2 even provides an automated model selection routine.

Additional features include:

- Auxiliary procedures for multivariate tests of long-run exclusion, weak exogeneity and stationarity, and for calculating eigenvalues and lambda-max and trace statistics for five different hypotheses.
- Ability to set and reset the rank of Π throughout the analysis, and a variety of tests to help you determine the “correct” rank order.
- Graphical analysis tools, including plots of the β -vectors to check stationarity, and of residuals to locate possible problems with the Gaussian assumption, plus correlograms and autocorrelograms.

- Descriptive statistics include: residual correlation matrices, the short-run parameters and associated t -values, estimates of the C-matrix (with asymptotic t -values) in the common trends representation, and the long-run covariance matrix.
- Structural tests, including non-identifying restrictions on β , identifying restrictions on β , and weak-exogeneity hypotheses on α .
- Supports recursive cointegration analysis, with tests for the constancy of the eigenvalues, stability of the estimated cointegration space and the estimated parameters, and the adequacy of the predictions from the model.

The CATS package includes the CATS procedures on diskette, a 200-page user’s manual, and sample data and program files.

The cost of a single copy of CATS is \$175. The price for full-time students is \$124 (verification of student status is required). Site license prices are also available.

Please note that CATS requires Version 6.2 or later of RATS, and is available for Windows, Macintosh, and UNIX platforms. Please contact us if you have any questions about CATS or RATS.

RATS Professional

The “Professional” versions of RATS add several useful features to the standard package, including: the Census Bureau’s X11 seasonal adjustment methodology; the ability to exchange data directly with FAME format database files; support for reading CRSP data files; and support for reading data via ODBC/SQL connections.

The X11 routine is implemented as a built-in instruction and as a menu-driven “Wizard”. This feature provides a fast and easy way to seasonally adjust data. It can be used in a loop to automatically adjust large numbers of series. It also makes it easy to combine seasonal adjustment with other tasks, including data transformations, model estimation, and forecasting.

The additional database support options simplify the task of getting data into RATS, and make it easier to exchange data with other users and applications.

Econometrics Texts

Example programs for many of these are included with RATS, and are available for downloading free of charge from our website (the Enders book ships with its own disk of RATS example programs).

Applied Econometric Time Series, by *Walter Enders*

(433 pages, hardbound)

RATS Handbook for Econ. Time Series, by *Walter Enders*

(204 pages, softbound)

Applied Econometric Time Series, now in its second edition, provides a lucid introduction to and discussion of most of the key topics in modern time series econometrics, including stationarity and unit roots, ARIMA models, volatility (ARCH/GARCH) models, cointegration, and more. Geared towards Masters and PhD students in time series analysis or advanced econometrics courses, and professionals wishing to learn more about time series techniques.

The *RATS Handbook* is very helpful resource for new RATS users, and for those looking to explore time series techniques in more depth. Useful as a stand-alone workbook or as a companion to *Applied Econometric Time Series*. Includes disk with data, programs.

Econometrics, by *Fumio Hayashi*

(683 pages, hardbound)

Hayashi's book approaches econometrics through the unifying framework of the Generalized Method of Moments (GMM). This makes for an excellent fit with RATS, as the RATS manual offers much of the same information without the technical details. Each chapter includes empirical exercises with real-world data sets, liberally laced with specific tips for users of RATS, TSP and Gauss. Not for the mathematically challenged.

Time Series Analysis, by *James D. Hamilton*

(799 pages, hardbound)

It's not an accident that Hamilton's book is referenced extensively in our latest revision of the RATS manual, and in many journal articles published since its release in 1994. A detailed treatment of modern time series analysis and econometrics, suitable as a textbook for the student and as an advanced reference for practicing researchers.

The Econometrics of Financial Markets, by *Campbell, Lo, and*

Mackinlay. (611 pages, hardbound)

This book focuses on the application of econometric techniques in the realm of financial markets. Geared towards PhD students, advanced MBA students, and financial industry professionals, it tackles everything from CAPM and Arbitrage models, to interest rate structures, ARCH models, and chaos theory.

Analysis of Financial Time Series, by *Ruey Tsay*

(448 pages, hardbound)

Based on an MBA course taught by the author, this covers a wide range of topics, from Box-Jenkins modeling, through ARCH and its relatives, duration models, continuous time models, value at risk calculations, and multivariate time series and volatility analysis. It includes RATS programs for ARCH, non-linear volatility models and duration models. (SCA is used for basic time series methods.)

Econometric Analysis of Cross Section and Panel Data, by

Jeffrey Wooldridge. (752 pages, hardbound)

Intended as a second semester graduate text, this book examines the special problems that the econometrician must face in applying linear regression, instrumental variables/GMM and SUR estimators to cross section and panel data. Also covers a wide range of non-linear models: probit, logit, censoring and sample selection, count data and duration models. This includes almost all techniques covered in Chapter 14 of the *RATS User's Guide* plus many more.

Databases

US Economic Data from Haver Analytics

In partnership with Haver Analytics, we are pleased to provide our customers with high quality U.S. economic database services at very reasonable prices. There are three packages from which to choose:

USECON Database

USECON (U.S. Economic Statistics) is Haver's primary database of U.S. economic and financial data. It includes approximately 12,000 series, including national accounts, prices, housing, construction, industrial production, interest rates, money supply, and much more.

USECON Plus USNA Databases

Purchasers of the USECON database have the option of also subscribing to the USNA (U.S. National Accounts) database, which offers an additional 20,000 series with complete national income and product accounts data from the Bureau of Economic Analysis. These provide detailed information such as monthly personal consumption expenditures and personal income.

US1 Database

The US1 database is a subset of the USECON database, containing approximately 750 of the most commonly-used data series.

Distribution Details

The data are supplied on CD, both in RATS format, and in Haver's DLX (Data Link Express) format. RATS users can access the RATS files directly using RATS or the RATSDATA utility program. Customers with Version 5 or later of WinRATS can also read data directly from the DLX versions of the data files. The CD also includes our menu-driven RATSDATA data-management software, for customers who do not have RATS or Haver's DLX software.

The databases are offered as a one-year subscription. Commercial institutions will receive updates every month. Academic institutions can choose monthly updates, quarterly updates, or just a single copy of the database (the "Annual" subscription).

OECD Main Economic Indicators Database

The OECD MEI database is available in "Full" and "Seven Country" versions. The Full version includes data on more than 30 countries, including Western Europe, the U.S., Canada, Japan, Turkey, Australia, New Zealand, Mexico, Russia, and the former Soviet republics. The seven country version includes only the G7 countries.

The data for most countries include GDP and its major components, producer and consumer price indexes, money stock and related measures, major interest rates, industrial production indexes, unemployment rates, exchange rate vs. the dollar, and the general stock market index. For larger countries, you will also find data on orders, shipments, and inventory stocks, plus greater disaggregation on the price and industrial production indexes. Many of the monthly series are available in both seasonally adjusted and unadjusted forms.

You can purchase a single copy of the OECD database, or you can purchase quarterly or monthly subscriptions. The data are supplied on CD, in our convenient RATS data file format, with one file per country. You can read the data directly into RATS, or use the included RATSDATA utility program to view, print, or graph data, or export data into text files, Excel spreadsheets, and other formats.