

With its innovative user-interface and powerful analysis engine, EViews 7 lets you manage data, perform econometric and statistical analysis, generate forecasts and model simulations, and produce high quality graphs and tables. Find out for yourself why EViews is a worldwide leader in statistical, econometric, and simulation software, and the choice of those who demand the very best.



# EViews 7

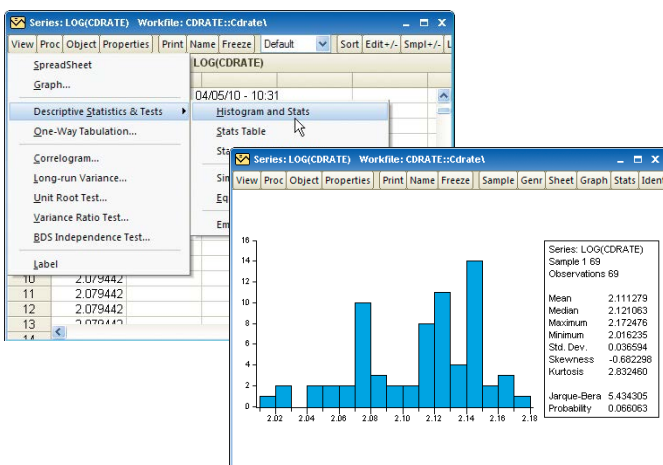
ESTIMATION . FORECASTING . STATISTICAL ANALYSIS  
 GRAPHICS . DATA MANAGEMENT . SIMULATION

## A MODERN USER INTERFACE

EViews brings modern windowing and object-based techniques to statistical, econometric, and simulation software.

At the heart of the innovative EViews interface is the concept of an object. Series, equations, and systems are just a few examples of objects. Each object has its own window, menus, procedures, and views of its data. Most statistical procedures are simply alternate views of the object.

For example, a menu choice from a series window changes the display between a spreadsheet, various graph views, descriptive statistics and tests, tabulations, correlograms, unit root, and independence and variance ratio tests.

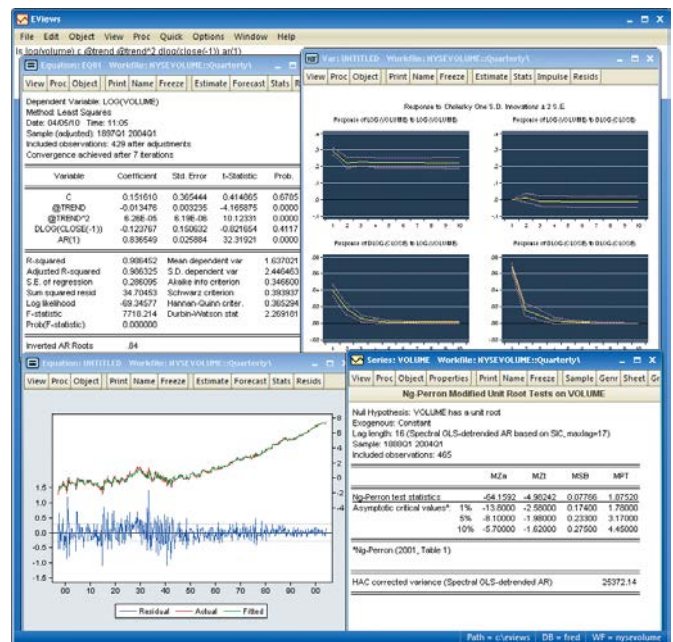


SELECT A HISTOGRAM VIEW FROM THE SERIES-SPECIFIC MENU.

Similarly, an equation window allows you to switch between a display of the equation specification, basic estimation results, the coefficient covariance matrix, actual-fitted-residual graphs and tables, forecast graphs and evaluations, and a wide range of diagnostic and hypothesis tests.

EViews also incorporates the best of modern spreadsheet and relational database technology by offering sophisticated linking tools that allows you to define relationships between objects and data sources. Series objects, for example, may be linked by formula to data in other series, to match merged or frequency converted data from alternate data sets, or to

external databases. When defined in this fashion, the linked series dynamically update whenever the underlying data change. Similarly, an EViews model simulation object can be linked to equation or system objects so that the model updates automatically when the underlying equation or system is re-specified or re-estimated.



EViews features true multiple window support.

Unlike programs that support viewing only one window or one set of results at a time, EViews allows simultaneous display of multiple objects and output, each in its own window. This true multiple window support makes it easy to perform side-by-side comparisons of series plots, hypothesis tests, equation results, and model forecasts developed under alternative assumptions.

Couple this with strong Windows integration, including drag-and-drop file import for over twenty popular file formats and copy-and-paste export of presentation quality graphs and tables, and you have a program that redefines our expectations of what econometric and statistical software can offer.

## POWERFUL ANALYTIC TOOLS

A modern, easy-to-use interface is nothing without state-of-the-art analytic tools. With a feature set extending well beyond its roots in time-series analysis, EViews 7 offers the tools most frequently used in practical settings.

## STATISTICAL ANALYSIS

EViews supports a wide range of basic statistical analyses, ranging from simple descriptive statistics to nonparametric hypothesis tests. Explore the time series properties of your data with autocorrelation plots or unit root and cointegration tests. Support for longitudinal data ranges from by-group and by-period statistics to panel unit root and cointegration diagnostics.

You can visualize the distribution of your data using various types of histograms, theoretical distribution, kernel density, or cumulative distribution, survivor, quantile, and QQ (quantile-quantile) plots. EViews also produces scatter plots with confidence ellipses or curves fit using ordinary, transformation, kernel, nearest neighbor regression.

You can even use EViews to construct graphs of raw or summary data for subsets

of the data that are defined using the values of categorical variables. You may, for example, readily display a bar plot of the mean incomes of individuals living in each state, or histograms of net returns by asset class, or kernel density plots of wages for union and non-union workers in different industries.

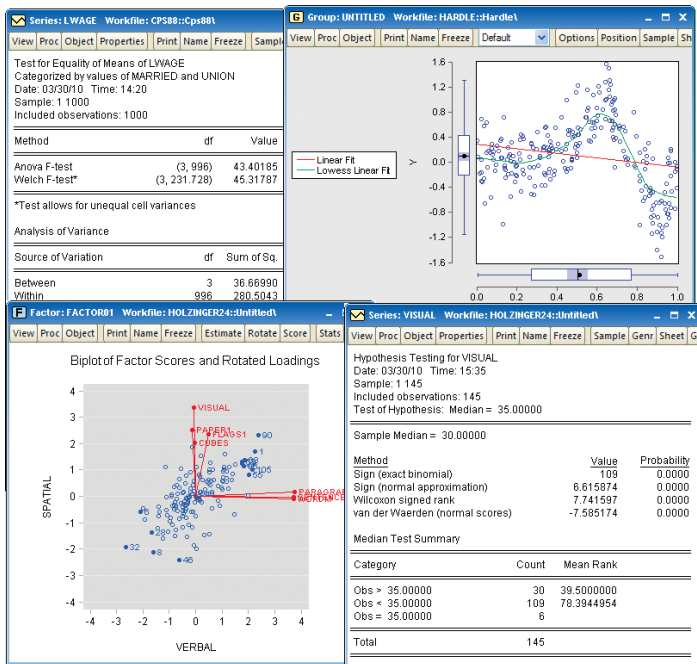
## ESTIMATION

When you're ready to perform estimation, choose from an extensive set of single equation estimators, including ordinary and nonlinear least squares (multiple regression), weighted least squares, two-stage least squares, Generalized Method of Moments (GMM), quantile regression, and Generalized Linear Models (GLM). For time series analysis, EViews estimates ARMA, ARMAX, and a variety of ARCH and cointegrating equation specifications. Estimation of limited dependent variable models for binary, ordered, censored (Tobit), truncated, and count data is supported. Longitudinal data are handled by a family of pooled time-series and panel estimators that includes modern Dynamic Panel Data (DPD) techniques.

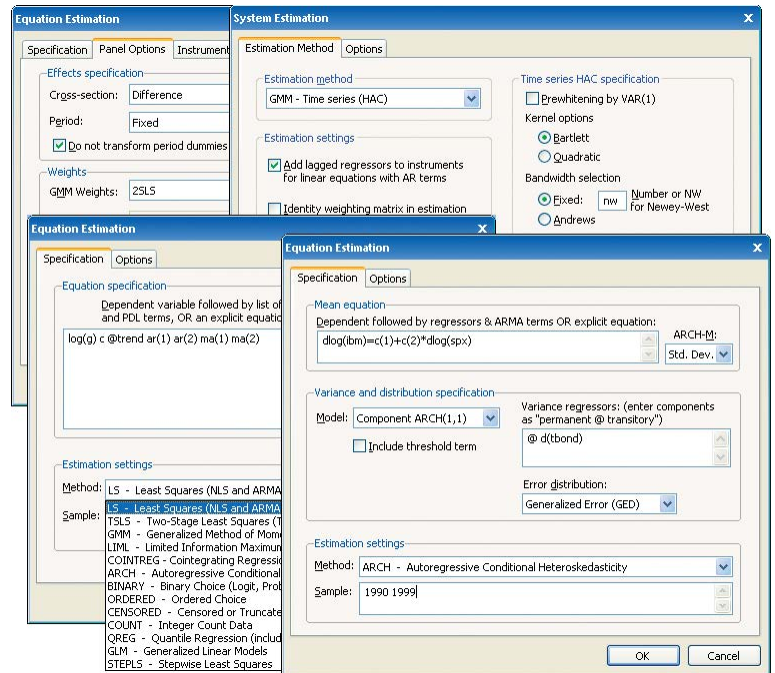
EViews offers powerful tools for analyzing systems of equations. You can use EViews to estimate linear and nonlinear systems by least squares, two-stage least squares, seemingly unrelated regression, three-stage least squares, GMM, and FIML. Additional support is provided for VAR and VEC, multivariate ARCH, and state space estimation (Kalman filtering).

For custom analysis, EViews' easy-to-use likelihood object permits estimation of user-specified maximum likelihood models. Simply provide EViews expressions to describe the log likelihood contributions, set coefficient starting values, and EViews will do the rest.

Once you estimate your equation or system, EViews makes it easy to perform specification and diagnostic tests. You can evaluate coefficient restrictions, compute residual and influence diagnostics, examine your specification for stability, and conduct a variety of estimator specific specification tests. If your favorite test is not supported directly, fast access to coefficients, residuals, gradients, and other estimation results makes it easy to construct your own diagnostics.

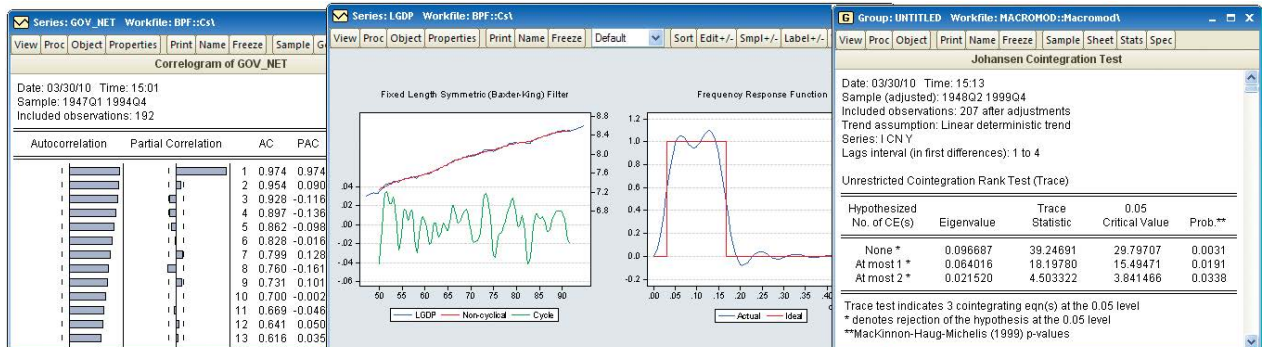


PERFORM A WIDE RANGE OF BASIC STATISTICAL ANALYSES.



WORK WITH AN EXTENSIVE SET OF EASY-TO-USE ECONOMETRIC ESTIMATION TOOLS.

## EXPLORE THE TIME SERIES PROPERTIES OF YOUR DATA.



# EViews 7 Features List

## DATA HANDLING

### BASIC

- Numeric, alphanumeric (string), and date series; value labels.
- Powerful language for expression handling and transforming data using operators and statistical, mathematical, financial, date and string functions, classification, or resampling.
- Samples and sample objects allow for transparent subsetting of data.
- Support for complex data structures including regular dated data, irregular dated data, high-frequency (intraday) data, cross-section data with observation identifiers, balanced and unbalanced panel data.
- Multi-page workfiles with support for dynamic frequency conversion and match merging of data between workfile pages.
- Auto-updating formula series are automatically recalculated whenever underlying data change.
- Match merge, join, append, subset, resize, sort, and reshape (stack and unstack) workfiles; create new workfile pages from values and dates in existing series.
- Drag-and-drop support for reading and importing data; simply drop files into EViews for automatic conversion or merging of foreign data into EViews workfile format. Easy-to-use tools for subsetting data on input.
- Convert data between EViews and various spreadsheet, statistical, and database formats, including: Microsoft Access® and Excel® files, Gauss Dataset files, SAS® Transport files, SPSS native and portable files, Stata files, raw formatted ASCII text or binary files, HTML, or ODBC databases and queries (ODBC support is provided only in the Enterprise Edition).
- EViews native, disk-based databases provide powerful query features and integration with EViews workfiles. OLEDB support for reading EViews workfiles and databases using OLEDB-aware clients or custom programs.
- Support for FRED® databases. Enterprise Edition support for Global Insight DRIPro and DRIBase, Haver Analytics® DLX®, FAME, EcoWin, Datastream, FactSet, and Moody's Economy.com databases.

### TIME SERIES

- Fully integrated support for handling dates and time series data with specialized time series functions and operators: lags, differences, log-differences, moving averages, etc.
- Frequency conversion (various high-to-low and low-to-high) and interpolation (linear, log-linear, Cagmul-Rom spline, Cardinal spline).
- Exponential smoothing: single, double, Holt-Winters.
- Hodrick-Prescott filtering. Band-pass (frequency) filtering: Baxter-King, Christiano-Fitzgerald fixed length and full sample asymmetric filters.
- Seasonal adjustment: X11, X12-ARIMA, Tramo/Seats, moving average.

## STATISTICS

### BASIC

- Basic data summaries; by-group summaries.
- Tests of equality: t-tests, ANOVA (balanced and unbalanced), Welch/Satterthwaite ANOVA, Wilcoxon, Mann-Whitney, Median Chi-square, Kruskal-Wallis, van der Waerden, F-test, Siegel-Tukey, Bartlett, Levene, Brown-Forsythe.
- One-way tabulation; cross-tabulation with measures of association (Phi Coefficient, Cramer's V, Contingency Coefficient) and independence testing (Pearson Chi-Square, Likelihood Ratio  $G^2$ ).
- Covariance and correlation analysis including Pearson, Spearman rank-order, Kendall's tau-a and tau-b and partial analysis; pairwise tests of zero correlation, multiple comparison adjustments.
- Principal components analysis including scree plots, biplots and loading plots, and weighted component score calculations.
- Factor analysis: tools for specifying the number of factors, six estimation methods (including ML and PACE), over 30 orthogonal and oblique rotation methods, more than a dozen factor score computation methods.
- Empirical Distribution Function (EDF) Tests for various distributions: Kolmogorov-Smirnov, Lilliefors, Cramer-von Mises, Anderson-Darling, and Watson.

### TIME SERIES

- Autocorrelation, partial autocorrelation, cross-correlation analysis, Q-statistics. Independence testing (Brock, Dechert, Scheinkman and LeBaron) and Variance ratio testing, Granger causality tests.
- Standalone long-run covariance calculation. HAC options including VARHAC, kernel, and prewhitened kernel, with fixed, Andrews, or Newey-West bandwidth selection.
- Unit root tests: Augmented Dickey-Fuller, GLS transformed Dickey-Fuller, Phillips-Perron, KPSS, Eliot-Richardson-Stock Point Optimal, Ng-Perron. Panel unit root tests: Levin-Lin-Chu, Breitung, Im-Pesaran-Shin, Fisher-type tests using ADF and PP tests (Maddala-Wu, Choi), Hadri.
- Johansen, Engle-Granger, Phillips-Ouliaris, Hansen, and Park cointegration tests. Panel cointegration tests: Pedroni, Kao, Maddala and Wu.

## ESTIMATION

### REGRESSION

- Linear and nonlinear ordinary least squares (multiple regression). Weighted least squares, Stepwise regression, Generalized Linear Models.
- Linear regression with PDLs on any number of independent variables.
- White and HAC robust standard errors with HAC options including VARHAC, kernel, and prewhitened kernel, with fixed, Andrews, or Newey-West bandwidth selection methods.
- Linear quantile regression and least absolute deviations (LAD) estimation with i.i.d., Huber's Sandwich, or bootstrap standard errors.
- Analytic derivatives for nonlinear estimation.

### INSTRUMENTAL VARIABLES AND GMM

- Linear and nonlinear two-stage least squares/instrumental variables (2SLS/IV) and Generalized Method of Moments (GMM) estimation.
- White, HAC, and user-specified GMM weighting. Continuously updated estimation.

### ARMA AND ARMAX

- Linear models with autoregressive moving average, seasonal autoregressive, and seasonal moving average errors.
- Nonlinear models with AR and SAR specifications.
- Estimation using the backcasting method of Box and Jenkins or by conditional least squares.

### ARCH/GARCH

- GARCH(p,q), EGARCH, TAR, Component GARCH, Power ARCH, integrated ARCH assuming Normal, Student's t, and Generalized Error Distributions.
- The linear or nonlinear mean equation may include ARCH and ARMA terms; both the mean and variance equations allow for exogenous variables.
- Bollerslev-Wooldridge robust standard errors.
- In- and out-of-sample forecasts of the conditional variance and mean, and the permanent components.

### LIMITED DEPENDENT VARIABLE MODELS

- Binary and Ordered Logit, Probit, and Gompit. Hosmer-Lemeshow and Andrews Goodness-of-Fit testing for binary models.
- Censored and truncated models with normal, logistic, and extreme value errors (Tobit, etc.).
- Count models with Poisson, negative binomial, and quasi-maximum likelihood (QML) specifications.
- Nonlinear and/or coefficient restricted index specifications.
- Huber/White robust standard errors. Count models also support generalized linear model or QML standard errors.

### PANEL DATA/POOLED TIME SERIES, CROSS-SECTIONAL DATA

- Linear and nonlinear least squares or 2SLS/IV estimation with additive cross-section and period fixed or random effects.
- Generalized least squares, generalized 2SLS/IV estimation, GMM estimation allowing for cross-section or period heteroskedastic and correlated specifications.

- Choice of quadratic unbiased estimators (QUES) for component variances in random effects models: Swamy-Arora, Wallace-Hussain, Wansbeek-Kapteyn.
- Linear dynamic panel data estimation using first differences or orthogonal deviations, with period-specific predetermined instruments (Arellano-Bond).
- Robust standard error calculations include seven types of robust Arellano, White, and Panel-corrected standard errors (PCSE).

#### **USER-SPECIFIED MAXIMUM LIKELIHOOD**

- Use standard EViews series expressions to describe the log likelihood contributions.
- Examples for multinomial logit, conditional logit, Box-Cox transformation models, disequilibrium switching models, probit models with heteroskedastic errors, nested logit, Heckman sample selection models, Weibull hazard models.

#### **SYSTEMS OF EQUATIONS**

- Linear and nonlinear estimation by least squares, 2SLS, equation weighted (GLS) estimation, Seemingly Unrelated Regression, Three-Stage Least Squares, Full Information Maximum Likelihood (FIML), GMM (with White or HAC weighting matrices).
- AR estimation using nonlinear least squares on a transformed specification.
- Multivariate ARCH: Conditional Constant Correlation(p,q) , Diagonal VEC(p,q), and Diagonal BEKK(p,q) models with asymmetric terms, normal or Student's t multivariate errors.

#### **VAR/VEC**

- Impulse response functions in various tabular and graphical formats with standard errors calculated analytically or by Monte Carlo methods. Shocks computed from Cholesky factorization, one-unit or one-standard deviation residuals, generalized impulses, structural factorization, user-specified vector/matrix.
- Estimate structural factorizations in VARs by imposing short- or long-run restrictions. Impose and test linear restrictions on the cointegrating relations and/or adjustment coefficients in VEC models.
- Extensive diagnostics including: Granger causality tests, joint lag exclusion tests, lag length criteria evaluation, correlograms, autocorrelation normality and heteroskedasticity testing, cointegration testing, other multivariate diagnostics.

#### **STATE SPACE**

- Kalman filter algorithm for estimating user-specified single- and multi-equation structural models. Models allow for exogenous variables in the state equation and fully parameterized variance specifications.
- Generate one-step ahead, filtered, or smoothed signals, states, and errors. Forecasting using n-step or smoothed values.

#### **TESTING AND EVALUATION**

- Actual, fitted, residual plots.
- Coefficient displays including standardized coefficients and elasticities. Variance inflation factors, influence diagnostics, leverage plots.
- Wald tests for linear and nonlinear coefficient restrictions; confidence ellipses showing the confidence region of functions of estimated parameters.
- Omitted and redundant variables LR tests, residual and squared residual correlograms and Q-statistics, residual serial correlation tests.
- Breusch-Pagan, Godfrey, Harvey and Gleijser, White, and ARCH heteroskedasticity tests.
- Chow breakpoint and forecast tests, Quandt-Andrews unknown breakpoint test, Ramsey RESET tests, OLS recursive estimation.
- ARMA equation diagnostics: graphs or tables of the inverse roots of the ARMA characteristic polynomial, compare theoretical (estimated) autocorrelation pattern with actual correlation pattern for structural residuals, display ARMA impulse response to an innovation shock.
- Easily save results (coefficients, coefficient covariance matrices, residuals, gradients, etc.) for further analysis.

#### **FORECASTING AND SIMULATION**

- In- or out-of-sample static or dynamic forecasting from estimated equation objects (with calculation of the standard error of the forecast).
- Forecast graphs and in-sample forecast evaluation: RMSE, MAE, MAPE, Theil Inequality Coefficient and proportions.
- State-of-the-art model building tools for multiple equation forecasting and multivariate simulation.
- Model equations may be entered in text or as links for automatic updating on re-estimation.
- Display dependency structure or endogenous and exogenous variables of your equations.
- Gauss-Seidel, Newton, and Broyden model solvers for non-stochastic and stochastic simulation. Non-stochastic forward solution solve for model consistent expectations.
- Solve control problems so that endogenous variable achieves a user-specified target.
- Sophisticated equation normalization, add factor and override support.
- Manage and compare multiple solution scenarios involving various sets of assumptions.
- Built-in model views and procedures display simulation results in graphical or tabular form.

#### **GRAPHS AND TABLES**

- Line, dot plot, area, bar, spike, seasonal, pie, xy-line, scatterplots, boxplots, error bar, high-low-open-close, and area band.
- Powerful, easy-to-use categorical and summary graphs. Categories and summaries may be combined in a single graph or displayed in multiple panels. Sophisticated tools allow you to customize graph titles and category labels for presentation.
- Histograms, average shifted histograms, frequency polygons, edge frequency polygons, kernel density, fitted theoretical distributions, boxplots, CDF, survivor, quantile, quantile-quantile.
- Scatterplots with any combination parametric and nonparametric kernel (Nadaraya-Watson, local linear, local polynomial) and nearest neighbor (LOWESS) regression lines, or confidence ellipses.
- Interactive point-and-click or command-based customization.
- Extensive customization of graph dimensions, legends, axes, scaling, lines, symbols, text, shading, with graph template features.
- Table customization with control over cell font face, size, and color, cell background color and borders, merging, and annotation.
- Copy-and-paste graphs into other Windows applications, or save as Windows metafiles, PostScript® files, GIF, JPEG, PNG, or bitmap files.
- Copy-and-paste tables to another application or save it to a RTF, HTML, or text file.
- Manage graphs and tables in a spool object that lets you organize and display multiple results and analysis.

#### **COMMANDS AND PROGRAMMING**

- Object-oriented command language provides access to menu items.
- Batch execution of commands in program files.
- Looping and condition branching, subroutine, and macro processing.
- Extensive matrix support: matrix manipulation, multiplication, inversion, Kronecker products, eigen analysis, and singular value decomposition.

#### **EXTERNAL INTERFACE AND ADD-INS SUPPORT**

- COM server and client support. Develop your own programs or scripts that launch or control EViews, transfer data, and execute EViews commands. Use COM client support to control MATLAB® and R servers.
- Easy-to-use OLEDB/Microsoft Excel® access to EViews data.
- The EViews Add-ins infrastructure offers seamless access to user-defined programs using the standard EViews command, menu, and object interface.
- Download and install predefined Add-ins from the EViews website.

## FORECASTING AND SIMULATION

EViews frees you from the complexities of constructing forecasts, allowing you to concentrate on the substance of your analysis.

You can generate static or dynamic forecasts from an estimated equation with a few mouse clicks. Forecast standard errors are calculated automatically and a graph of the 95 percent confidence interval and forecast evaluation statistics may be displayed. If your dependent variable involves a transformation such as differencing or logarithms, you may generate forecasts for either the transformed dependent variable or the underlying series.

Multiple equation forecasting is handled by the EViews model object. Comparable in function to the best stand-alone simulation programs, the model object provides the tools demanded by professional model builders for designing, analyzing, and solving large systems of equations. Models support a variety of solution methods, including stochastic simulation and forward solution for model consistent expectations, as well as tools for managing alternative solution scenarios and user-specified add factors. Models also allow you to examine the dependency structure of the endogenous variables, to solve simple control problems, and to generate custom tables and graphs

comparing solution results under alternative assumptions.

Models may be tightly integrated with EViews estimation objects. While you can specify the equations of a model by typing in simple algebraic expressions, you may also link previously estimated equation, system, or VAR objects to a model, so that the model automatically updates whenever its underlying equations are re-estimated.

## SOPHISTICATED DATA MANAGEMENT

EViews offers the widest range of data management tools available in econometric software. Featuring an extensive library of mathematical, statistical, date, string, and time series operators and functions, and comprehensive support for numeric, character, and date data, EViews offers the data handling features you require.

EViews goes beyond the conventional, with support for complex data structures involving regular or irregular dated data (e.g., intraday and trading day), cross-section data with observation identifiers, and panel data. EViews' state-of-the-art expression handling and linking features allow for dynamic formula evaluation, match merging, and automatic frequency conversion.

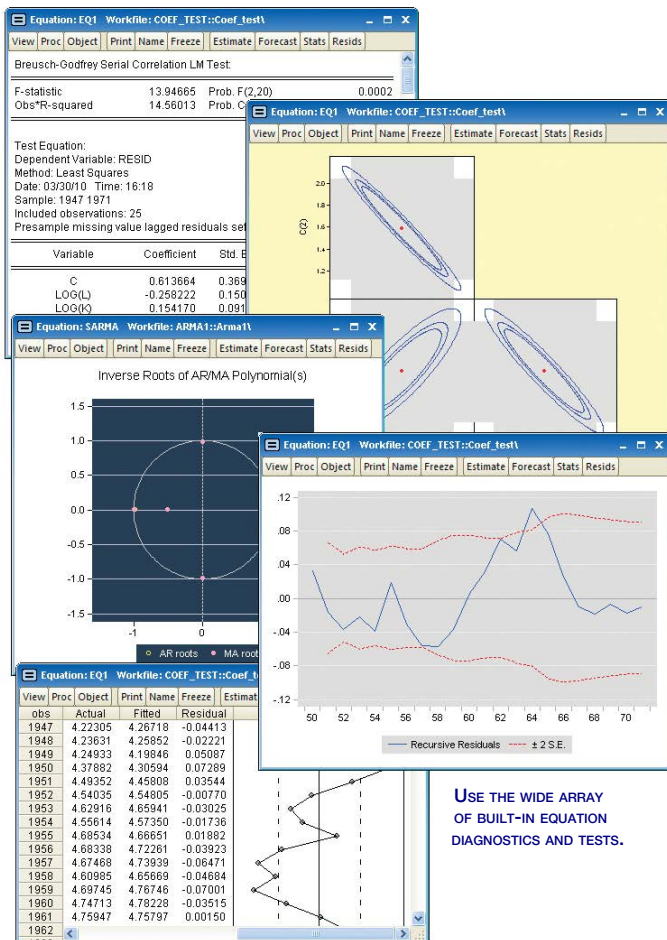
Exchanging data with other programs is easy, since EViews reads and writes over 20 popular data formats. Simply drag-and-drop your foreign file onto EViews and your data automatically appears in an EViews workfile. Or share your EViews data with others by writing directly to a format like Microsoft Excel. You can even use the EViews Enterprise Edition to read directly from a relational database using an ODBC query statement or by opening an ODBC DSN or query file. EViews also offers easy-to-use tools for reading data from a variety of commercial data vendors.

## PRESENTATION QUALITY OUTPUT

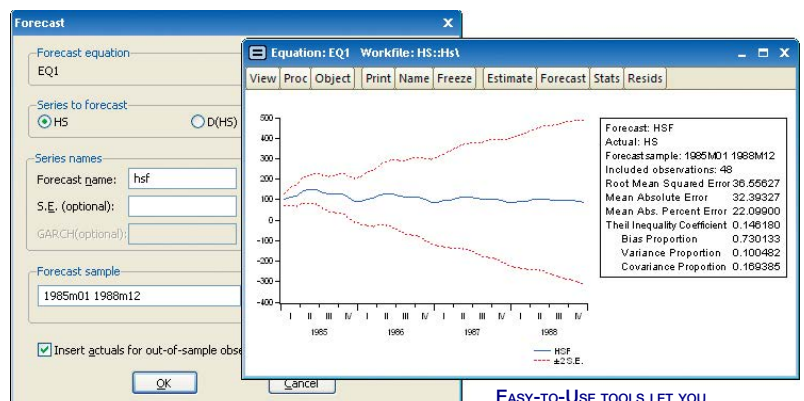
EViews 7 supports a wide range of basic graph types including line graphs, bar graphs, filled area graphs, pie charts, scatter diagrams, mixed line-bar graphs, high-low graphs, scatterplots, and boxplots. Any number of graphs can be combined into a single graph for presentation.

Various options give you control over line types, symbols, color, frame and border characteristics, headings, shading, and scaling. Legends are automatically created and you can add labels and annotation in any scalable Windows font anywhere on your graph.

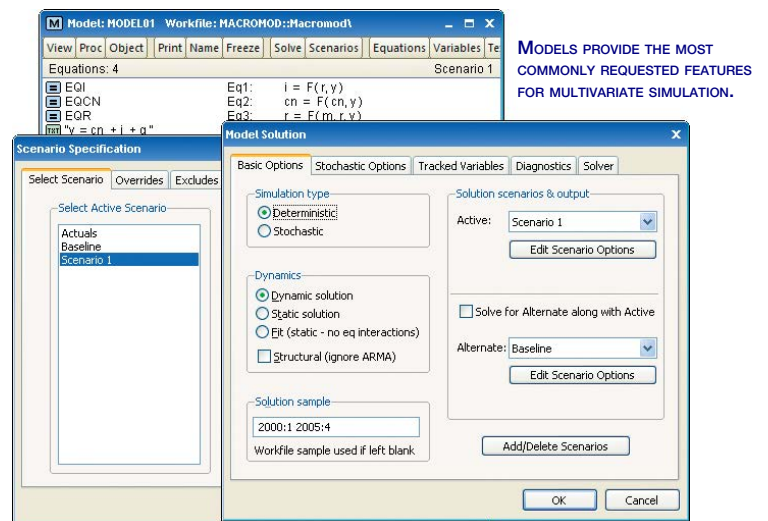
Customizing a graph is as simple as modifying or moving graphic elements on the



USE THE WIDE ARRAY OF BUILT-IN EQUATION DIAGNOSTICS AND TESTS.



EASY-TO-USE TOOLS LET YOU CONCENTRATE ON THE SUBSTANCE OF YOUR FORECASTING PROBLEM.



MODELS PROVIDE THE MOST COMMONLY REQUESTED FEATURES FOR MULTIVARIATE SIMULATION.

