Meaning of Internet

A global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols.

The Internet is a global wide area network that connects computer systems across the world. It includes several high-bandwidth data lines that comprise the Internet "backbone." These lines are connected to major Internet hubs that distribute data to other locations, such as web servers and ISPs.

Uses of Internet

1. Electronic mail. At least 85% of the inhabitants of cyberspace send and receive e-mail. Some 20 million e-mail messages cross the Internet every week.
2. Research.
3. Downloading files.
4. Discussion groups. These include public groups, such as those on Usenet, and the private mailing lists that ListServ manages.
5. Interactive games and entertainment. To play games with virtual players, listen to audio and video
6. Education and self-improvement. On-line courses and workshops have found yet another outlet.
7. Friendship and dating. You may be surprised at the number of electronic “personals” that you can find on the World Wide Web.
8. Electronic newspapers and magazines. This category includes late-breaking news, weather, and sports. We’re likely to see this category leap to the top five in the next several years.
9. Job-hunting. Classified ads are in abundance, but most are for technical positions.
10. Banking and Shopping. It’s difficult to believe that this category even ranks. It appears that “cybermalls” are more for curious than serious shoppers.

Features of Internet

The features are described below −

1. Accessibility An Internet is a global service and accessible to all. Today, people located in a remote part of an island or interior of Africa can also use Internet.
2. Easy to Use: The software, which is used to access the Internet (web browser), is designed very simple; therefore, it can be easily learned and used. It is easy to develop.
3. Interaction with Other Media: Internet service has a high degree of interaction with other media. For example, News and other magazine, publishing houses have extended their business with the help of Internet services.

4. Low Cost: The development and maintenance cost of Internet service are comparatively low.
5. Extension of Existing IT Technology : This facilitates the sharing of IT technology by multiple users in organizations and even facilitates other trading partners to use.

6. Flexibility of Communication : Communication through Internet is flexible enough. It facilitates communication through text, voice, and video too. These services can be availed at both organizational and individual levels.

7. Security

Internet facility has to a certain extent helped the security system both at the individual and national level with components such as CCTV camera, etc. Anti virus, fire wall are the few security systems available to protect the user from the theft of data.

Sources of Data : Centre Statistics Office (CSO)

CSO has five important division which maintain and provide various statistical information. They are

1. National Accounts Division (NAD)- responsible for the national income accounts details like GDP, SDP
2. Social Statistics Division (SSD) - responsible for monitoring developments goals, conduct of workshops/seminars and periodical publications of reports.
3. Economic Statistics Division (ESD) - This Division conducts Economic Censuses, compiles All India Index of Industrial Production(IIP), Energy Statistics and Infrastructure Statistics, and develops classifications like, National Industrial Classification (NIC) and National Product Classification (NPC)
4. Training Division: This Division is primarily responsible for the training manpower in theoretical and applied statistics to tackle the emerging challenges of data collection, collation, analysis and dissemination required for evidence based policy making as also for planning, monitoring and evaluation.
5. Coordination and Publications Division: The Division looks after co-ordination work within CSO as well as with the line Ministries and State/UT Governments in statistical matters, organizes Conference of Central and State Statistical Organizations

Ministry of Statistics and Programme Implementation (MOSPI) (www.mospi.nic.in)

The Ministry of Statistics and Programme Implementation came into existence as an Independent Ministry on 15.10.1999 after the merger of the Department of Statistics and the Department of Programme Implementation. The Ministry has two wings, one relating to Statistics and the other Programme Implementation. The Statistics Wing called the National Statistical Office(NSO) consists of the Central Statistical Office (CSO), the Computer center

and the National Sample Survey Office (NSSO). The Programme Implementation Wing has three Divisions, namely, (i) Twenty Point Programme (ii) Infrastructure Monitoring and Project Monitoring and (iii) Member of Parliament Local Area Development Scheme. Besides these two wings, there is National Statistical Commission created through a Resolution of Government of India (MOSPI) and one autonomous Institute, viz., Indian Statistical Institute declared as an institute of National importance by an Act of Parliament.

The Ministry of Statistics and Programme Implementation attaches considerable importance to coverage and quality aspects of statistics released in the country. The statistics released are based on administrative sources, surveys and censuses conducted by the center and State Governments and non-official sources and studies. The surveys conducted by the Ministry are based on scientific sampling methods. Field data are collected through dedicated field staff. In line with the emphasis on the quality of statistics released by the Ministry, the methodological issues concerning the compilation of national accounts are overseen Committees like Advisory Committee on National Accounts, Standing Committee on Industrial Statistics, Technical Advisory Committee on Price Indices. The Ministry compiles data sets based on current data, after applying standard statistical techniques and extensive scrutiny and supervision.

Reserve Bank of India (RBI)

RBI is an importance source of economic data particularly Indian banking sector. Besides this, RBI publishes regular reports on various aspects of India economy.

Annual publications, Half-yearly, quarterly, monthly and other periodical reports

RBI monthly bulletin and Hand book of Statistics on India economy are important publications of RBI. Besides these, RBI has data bank on Indian economy where sector wise economic data are available for research.

www.rbi.org.in

SPSS

SPSS stands for “Statistical Package for the Social Sciences”. It is an IBM tool. This tool first launched in 1968. This is one software package. This package is mainly used for statistical analysis of the data.

SPSS is mainly used in the following areas like healthcare, marketing, and educational research, market researchers, health researchers, survey companies, education researchers, government, marketing organizations, data miners, and many others.

It provides data analysis for descriptive statistics, numeral outcome predictions, and identifying groups. This software also gives data transformation, graphing and direct marketing features to manage data smoothly.

Features of SPSS

The data from any survey collected via Survey Gizmo gets easily exported to SPSS for detailed and good analysis.

In SPSS, data gets stored in.SAV format. These data mostly comes from surveys. This makes the process of manipulating, analyzing and pulling data very simple.

SPSS have easy access to data with different variable types. These variable data is easy to understand. SPSS helps researchers to set up model easily because most of the process is automated.

After getting data in the magic of SPSS starts. There is no end on what we can do on this data.

SPSS has a unique way to get data from critical data also. Trend analysis, assumptions, and predictive models are some of the characteristics of SPSS.

SPSS is easy for you to learn, use and apply.

It helps in to get data management system and editing tools handy.

SPSS offers you in-depth statistical capabilities for analyzing the exact outcome.

SPSS helps us to design, plotting, reporting and presentation features for more clarity.

Statistical Methods of SPSS

There are many statistical methods that can be used in SPSS which are as follows:

Prediction for a variety of data for identifying groups and including methodologies such as cluster analysis, factor analysis, etc.

Descriptive statistics, including methodologies of SPSS, are frequencies, cross tabulation, and descriptive ratio statistics which are very useful.

Also, Bivariate statistics, including methodologies like analysis of variance (ANOVA), means, correlation, and nonparametric tests, etc.

Numeral outcome prediction such as linear regression.

It is a kind of self-descriptive tool which automatically considers that you want to open an existing file, and with that opens a dialog box to ask which file you would like to open. This approach of SPSS makes it very easy to navigate the interface and windows in SPSS if we open a file.

Besides the statistical analysis of data, the SPSS software also provides features of data management, this allows the user to do a selection, create derived data and perform file reshaping, etc. Another feature is data documentation. This feature stores a metadata dictionary along with the data file.

What Is SPSS and Its Importance in Research & Data Analysis?

SPSS (Statistical package for the social sciences) is the set of software programs that are combined together in a single package. The basic application of this program is to analyze scientific data related with the social science. This data can be used for market research, surveys, data mining, etc.

With the help of the obtained statistical information, researchers can easily understand the demand for a product in the market, and can change their strategy accordingly. Basically, SPSS first store and organize the provided data, then it compiles the data set to produce suitable output. SPSS is designed in such a way that it can handle a large set of variable data formats.

Read How SPSS Helps in Research & Data Analysis Programs:

SPSS is revolutionary software mainly used by research scientists which help them process critical data in simple steps. Working on data is a complex and time consuming process, but this software can easily handle and operate information with the help of some techniques. These techniques are used to analyze, transform, and produce a characteristic pattern between different data variables. In addition to it, the output can be obtained through graphical representation so that a user can easily understand the result. Read below to understand the factors that are responsible in the process of data handling and its execution.

1. Data Transformation: This technique is used to convert the format of the data. After changing the data type, it integrates same type of data in one place and it becomes easy to manage it. You can insert the different kind of data into SPSS and it will change its structure as per the system specification and requirement. It means that even if you change the operating system, SPSS can still work on old data.

2. Regression Analysis: It is used to understand the relation between dependent and interdependent variables that are stored in a data file. It also explains how a change in the value of an interdependent variable can affect the dependent data. The primary need of regression analysis is to understand the type of relationship between different variables.

3. ANOVA(Analysis of variance): It is a statistical approach to compare events, groups or processes, and find out the difference between them. It can help you understand which method is more suitable for executing a task. By looking at the result, you can find the feasibility and effectiveness of the particular method.

4. MANOVA(Multivariate analysis of variance): This method is used to compare data of random variables whose value is unknown. MANOVA technique can also be used to analyze different types of population and what factors can affect their choices.

5. T-tests: It is used to understand the difference between two sample types, and researchers apply this method to find out the difference in the interest of two kinds of groups. This test can also understand if the produced output is meaningless or useful.

This software was developed in 1960, but later in 2009, IBM acquired it. They have made some significant changes in the programming of SPSS and now it can perform many types of research task in various fields. Due to this, the use of this software is extended to many industries and organizations, such as marketing, health care, education, surveys, etc.

Author's Bio: John is an academic writer, and has assisted many students by providing them SPSS assignment help. He has been working in the field of academic consultancy for a long time now and has a wonderful experience.

EViews 10 Overview

A combination of power and ease-of-use make EViews the ideal package for anyone working with time series, cross-section, or longitudinal data. With EViews, you can quickly and efficiently manage your data, perform econometric and statistical analysis, generate forecasts or model simulations, and produce high quality graphs and tables for publication or inclusion in other applications.

Featuring an innovative graphical object-oriented user-interface and a sophisticated analysis engine, EViews blends the best of modern software technology with the features you've always wanted. The result is a state-of-the art program that offers unprecedented power within a flexible, easy-to-use interface.

Find out for yourself why EViews is the worldwide leader in Windows-based econometric software and the choice of those who demand the very best.

- An Intuitive, Easy-to-Use Interface
- Powerful Analytic Tools
- Sophisticated Data Management
- Presentation Quality Output
- Traditional Command Line and Programming Interface

BASIC DATA HANDLING

- Numeric, alphanumeric (string), and date series; value labels.

- Extensive library of operators and statistical, mathematical, date and string functions.

- Powerful language for expression handling and transforming existing data using operators and functions.

- Samples and sample objects facilitate processing on subsets of data.

- Support for complex data structures including regular dated data, irregular dated data, cross-section data with observation identifiers, dated, and undated panel data.

- Multi-page workfiles.

- EViews native, disk-based databases provide powerful query features and integration with EViews workfiles.

- Convert data between EViews and various spreadsheet, statistical, and database formats, including (but not limited to): Microsoft Access® and Excel® files (including .XSLX and .XLSM), Gauss Dataset files, SAS® Transport files, SPSS native and portable files, Stata files, Tableau®, raw formatted ASCII text or binary files, HTML, or ODBC databases and queries (ODBC support is provided only in the Enterprise Edition).

- OLE support for linking EViews output, including tables and graphs, to other packages, including Microsoft Excel®, Word® and Powerpoint®.

- OLEDB support for reading EViews workfiles and databases using OLEDB-aware clients or custom programs.

- Support for FRED® (Federal Reserve Economic Data) database. Enterprise Edition support for Global Insight DRIPro and DRIBase, Haver Analytics® DLX®, FAME, EcoWin, Bloomberg®, EIA®, CEIC®®, Datastream®, FactSet, and Moody's Economy.com, World Bank, and EuroStat databases.

- The EViews Microsoft Excel® Add-in allows you to link or import data from EViews workfiles and databases from within Excel.

- Drag-and-drop support for reading data; simply drop files into EViews for automatic conversion and linking of foreign data and metadata into EViews workfile format.

- Powerful tools for creating new workfile pages from values and dates in existing series.

- Match merge, join, append, subset, resize, sort, and reshape (stack and unstack) workfiles.

- Easy-to-use automatic frequency conversion when copying or linking data between pages of different frequency.

- Frequency conversion and match merging support dynamic updating whenever underlying data change.

- Auto-updating formula series that are automatically recalculated whenever underlying data change.
- Easy-to-use frequency conversion: simply copy or link data between pages of different frequency.
- Tools for resampling and random number generation for simulation. Random number generation for 18 different distribution functions using three different random number generators.
- Support for cloud drive access, allowing you to open and save file directly to Dropbox, OneDrive, Google Drive and Box accounts.

TIME SERIES DATA HANDLING

- Integrated support for handling dates and time series data (both regular and irregular).
- Support for common regular frequency data (Annual, Semi-annual, Quarterly, Monthly, Bimonthly, Fortnight, Ten-day, Weekly, Daily - 5 day week, Daily - 7 day week).
- Support for high-frequency (intraday) data, allowing for hours, minutes, and seconds frequencies. In addition, there are a number of less commonly encountered regular frequencies, including Multi-year, Bimonthly, Fortnight, Ten-Day, and Daily with an arbitrary range of days of the week.
- Specialized time series functions and operators: lags, differences, log-differences, moving averages, etc.
- Frequency conversion: various high-to-low and low-to-high methods.
- Exponential smoothing: single, double, Holt-Winters, and ETS smoothing.
- Built-in tools for whitening regression.
- Hodrick-Prescott filtering.
- Band-pass (frequency) filtering: Baxter-King, Christiano-Fitzgerald fixed length and full sample asymmetric filters.
- Seasonal adjustment: Census X-13, STL Decomposition, MoveReg, X-12-ARIMA, Tramo/Seats, moving average.
- Interpolation to fill in missing values within a series: Linear, Log-Linear, Catmull-Rom Spline, Cardinal Spline.

STATISTICS

Basic

- Basic data summaries; by-group summaries.
- Tests of equality: t-tests, ANOVA (balanced and unbalanced, with or without heteroskedastic variances.), 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.

- Principal components analysis including scree plots, biplots and loading plots, and weighted component score calculations.

- Factor analysis allowing computation of measures of association (including covariance and correlation), uniqueness estimates, factor loading estimates and factor scores, as well as performing estimation diagnostics and factor rotation using one of over 30 different orthogonal and oblique methods.

- Empirical Distribution Function (EDF) Tests for the Normal, Exponential, Extreme value, Logistic, Chi-square, Weibull, or Gamma distributions (Kolmogorov-Smirnov, Lilliefors, Cramer-von Mises, Anderson-Darling, Watson).

- Histograms, Frequency Polygons, Edge Frequency Polygons, Average Shifted Histograms, CDF-survivor-quantile, Quantile-Quantile, kernel density, fitted theoretical distributions, boxplots.

- Scatterplots with parametric and non-parametric regression lines (LOWESS, local polynomial), kernel regression (Nadaraya-Watson, local linear, local polynomial)., or confidence ellipses.

Time Series

- Autocorrelation, partial autocorrelation, cross-correlation, Q-statistics.

- Granger causality tests, including panel Granger causality.

- Unit root tests: Augmented Dickey-Fuller, GLS transformed Dickey-Fuller, Phillips-Perron, KPSS, Eliot-Richardson-Stock Point Optimal, Ng-Perron, as well as tests for unit roots with breakpoints.

- Cointegration tests: Johansen, Engle-Granger, Phillips-Ouliaris, Park added variables, and Hansen stability.

- Independence tests: Brock, Dechert, Scheinkman and LeBaron

- Variance ratio tests: Lo and MacKinlay, Kim wild bootstrap, Wright's rank, rank-score and sign-tests. Wald and multiple comparison variance ratio tests (Richardson and Smith, Chow and Denning).

- Long-run variance and covariance calculation: symmetric or or one-sided long-run covariances using nonparametric kernel (Newey-West 1987, Andrews 1991), parametric VARHAC (Den Haan and Levin 1997), and prewhitened kernel (Andrews and Monahan 1992) methods. In addition, EViews supports Andrews (1991) and Newey-West (1994) automatic bandwidth selection methods for kernel estimators, and information criteria based lag length selection methods for VARHAC and prewhitening estimation.

Panel and Pool

- By-group and by-period statistics and testing.
- Unit root tests: Levin-Lin-Chu, Breitung, Im-Pesaran-Shin, Fisher, Hadri.
- Cointegration tests: Pedroni, Kao, Maddala and Wu.
- Panel within series covariances and principal components.
- Dumitrescu-Hurlin (2012) panel causality tests.
- Cross-section dependence tests.

ESTIMATION

Regression

- Linear and nonlinear ordinary least squares (multiple regression).
- Linear regression with PDLs on any number of independent variables.
- Robust regression.
- Analytic derivatives for nonlinear estimation.
- Weighted least squares.
- White and other heteroskedasticity consistent, and Newey-West robust standard errors. HAC standard errors may be computed using nonparametric kernel, parametric VARHAC, and prewhitened kernel methods, and allow for Andrews and Newey-West automatic bandwidth selection methods for kernel estimators, and information criteria based lag length selection methods for VARHAC and prewhitening estimation.
- Clustered standard errors.
- Linear quantile regression and least absolute deviations (LAD), including both Huber's Sandwich and bootstrapping covariance calculations.
- Stepwise regression with seven different selection procedures.
- Threshold regression including TAR and SETAR, and smooth threshold regression including STAR.
- ARDL estimation, including the Bounds Test approach to cointegration.

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, conditional least squares, ML or GLS.
- Fractionally integrated ARFIMA models.

Instrumental Variables and GMM

- Linear and nonlinear two-stage least squares/instrumental variables (2SLS/IV) and Generalized Method of Moments (GMM) estimation.
- Linear and nonlinear 2SLS/IV estimation with AR and SAR errors.
- Limited Information Maximum Likelihood (LIML) and K-class estimation.
- Wide range of GMM weighting matrix specifications (White, HAC, User-provided) with control over weight matrix iteration.
- GMM estimation options include continuously updating estimation (CUE), and a host of new standard error options, including Windmeijer standard errors.
- IV/GMM specific diagnostics include Instrument Orthogonality Test, a Regressor Endogeneity Test, a Weak Instrument Test, and a GMM specific breakpoint test.

ARCH/GARCH

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

Limited Dependent Variable Models

- Binary Logit, Probit, and Gompit (Extreme Value).
- Ordered Logit, Probit, and Gompit (Extreme Value).
- 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.
- Heckman Selection models.
- Huber/White robust standard errors.
- Count models support generalized linear model or QML standard errors.
- Hosmer-Lemeshow and Andrews Goodness-of-Fit testing for binary models.
- Easily save results (including generalized residuals and gradients) to new EViews objects for further analysis.

- General GLM estimation engine may be used to estimate several of these models, with the option to include robust covariances.

Panel Data/Pooled Time Series, Cross-Sectional Data

- Linear and nonlinear estimation with additive cross-section and period fixed or random effects.
- Choice of quadratic unbiased estimators (QUEs) for component variances in random effects models: Swamy-Arora, Wallace-Hussain, Wansbeek-Kapteyn.
- 2SLS/IV estimation with cross-section and period fixed or random effects.
- Estimation with AR errors using nonlinear least squares on a transformed specification
- Generalized least squares, generalized 2SLS/IV estimation, GMM estimation allowing for cross-section or period heteroskedastic and correlated specifications.
- Linear dynamic panel data estimation using first differences or orthogonal deviations with period-specific predetermined instruments (Arellano-Bond).
- Panel serial correlation tests (Arellano-Bond).
- Robust standard error calculations include seven types of robust White and Panel-corrected standard errors (PCSE).
- Testing of coefficient restrictions, omitted and redundant variables, Hausman test for correlated random effects.
- Panel unit root tests: Levin-Lin-Chu, Breitung, Im-Pesaran-Shin, Fisher-type tests using ADF and PP tests (Maddala-Wu, Choi), Hadri.
- Panel cointegration estimation: Fully Modified OLS (FMOLS, Pedroni 2000) or Dynamic Ordinary Least Squares (DOLS, Kao and Chaing 2000, Mark and Sul 2003).
- Pooled Mean Group (PMG) estimation.

Generalized Linear Models

- Normal, Poisson, Binomial, Negative Binomial, Gamma, Inverse Gaussian, Exponential Mena, Power Mean, Binomial Squared families.
- Identity, log, log-complement, logit, probit, log-log, complimentary log-log, inverse, power, power odds ratio, Box-Cox, Box-Cox odds ratio link functions.
- Prior variance and frequency weighting.
- Fixed, Pearson Chi-Sq, deviance, and user-specified dispersion specifications. Support for QML estimation and testing.
- Quadratic Hill Climbing, Newton-Raphson, IRLS - Fisher Scoring, and BHHH estimation algorithms.
- Ordinary coefficient covariances computed using expected or observed Hessian or the outer product of the gradients. Robust covariance estimates using GLM, HAC, or Huber/White methods.

Single Equation Cointegrating Regression

- Support for three fully efficient estimation methods, Fully Modified OLS (Phillips and Hansen 1992), Canonical Cointegrating Regression (Park 1992), and Dynamic OLS (Saikkonen 1992, Stock and Watson 1993
- Engle and Granger (1987) and Phillips and Ouliaris (1990) residual-based tests, Hansen's (1992b) instability test, and Park's (1992) added variables test.
- Flexible specification of the trend and deterministic regressors in the equation and cointegrating regressors specification.
- Fully featured estimation of long-run variances for FMOLS and CCR.
- Automatic or fixed lag selection for DOLS lags and leads and for long-run variance whitening regression.
- Rescaled OLS and robust standard error calculations for DOLS.

User-specified Maximum Likelihood

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

SYSTEMS OF EQUATIONS

Basic

- Linear and nonlinear estimation.
- Least squares, 2SLS, equation weighted estimation, Seemingly Unrelated Regression, and Three-Stage Least Squares.
- GMM with White and HAC weighting matrices.
- AR estimation using nonlinear least squares on a transformed specification.
- Full Information Maximum Likelihood (FIML).

VAR/VEC

- Estimate structural factorizations in VARs by imposing short- or long-run restrictions, or both.
- Bayesian VARs.
- Impulse response functions in various tabular and graphical formats with standard errors calculated analytically or by Monte Carlo methods.
- Impulse response shocks computed from Cholesky factorization, one-unit or one-standard deviation residuals (ignoring correlations), generalized impulses, structural factorization, or a user-specified vector/matrix form.
- Historical decomposition of standard VAR models.

- Impose and test linear restrictions on the cointegrating relations and/or adjustment coefficients in VEC models.
- View or generate cointegrating relations from estimated 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.

Multivariate ARCH

- Conditional Constant Correlation (p,q), Diagonal VECH (p,q), Diagonal BEKK (p,q), with asymmetric terms.
- Extensive parameterization choice for the Diagonal VECH's coefficient matrix.
- Exogenous variables allowed in the mean and variance equations; nonlinear and AR terms allowed in the mean equations.
- Bollerslev-Wooldridge robust standard errors.
- Normal or Student's t multivariate error distribution
- A choice of analytic or (fast or slow) numeric derivatives. (Analytics derivatives not available for some complex models.)
- Generate covariance, variance, or correlation in various tabular and graphical formats from estimated ARCH models.

State Space

- Kalman filter algorithm for estimating user-specified single- and multiequation structural models.
- Exogenous variables in the state equation and fully parameterized variance specifications.
- Generate one-step ahead, filtered, or smoothed signals, states, and errors.
- Examples include time-varying parameter, multivariate ARMA, and quasilikelihood stochastic volatility models.

TESTING AND EVALUATION

- Actual, fitted, residual plots.
- Wald tests for linear and nonlinear coefficient restrictions; confidence ellipses showing the joint confidence region of any two functions of estimated parameters.
- Other coefficient diagnostics: standardized coefficients and coefficient elasticities, confidence intervals, variance inflation factors, coefficient variance decompositions.
- Omitted and redundant variables LR tests, residual and squared residual correlograms and Q-statistics, residual serial correlation and ARCH LM tests.
- White, Breusch-Pagan, Godfrey, Harvey and Glejser heteroskedasticity tests.

- Stability diagnostics: Chow breakpoint and forecast tests, Quandt-Andrews unknown breakpoint test, Bai-Perron breakpoint tests, Ramsey RESET tests, OLS recursive estimation, influence statistics, leverage plots.

- ARMA equation diagnostics: graphs or tables of the inverse roots of the AR and/or MA characteristic polynomial, compare the theoretical (estimated) autocorrelation pattern with the actual correlation pattern for the structural residuals, display the ARMA impulse response to an innovation shock and the ARMA frequency spectrum.

- Easily save results (coefficients, coefficient covariance matrices, residuals, gradients, etc.) to EViews objects for further analysis.

See also Estimation and Systems of Equations for additional specialized testing procedures.

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 propo

- 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, Broyden and Newton model solvers for non-stochastic and stochastic simulation. Non-stochastic forward solution solve for model consistent expectations. Stochasitc simulation can use bootstrapped residuals.

- 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, bubbleplots, boxplots, error bar, high-low-open-close, and area band.

- Powerful, easy-to-use categorical and summary graphs.

- Auto-updating graphs which update as underlying data change.
- Observation info and value display when you hover the cursor over a point in the graph.
- Histograms, average shifted historgrams, frequency polyons, edge frequency polygons, boxplots, 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 background, frame, legends, axes, scaling, lines, symbols, text, shading, fading, with improved 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 graphs as Windows regular or enhanced metafiles, encapsulated PostScript files, bitmaps, GIFs, PNGs or JPGs.
- Copy-and-paste tables to another application or save to an RTF, HTML, LaTeX, PDF, or text file.
- Manage graphs and tables together in a spool object that lets you display multiple results and analyses in one object

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.
- String and string vector objects for string processing. Extensive library of string and string list functions.
- Extensive matrix support: matrix manipulation, multiplication, inversion, Kronecker products, eigenvalue solution, and singular value decomposition.

EXTERNAL INTERFACE AND ADD-INS

- EViews COM automation server support so that external programs or scripts can launch or control EViews, transfer data, and execute EViews commands.
- EViews offers COM Automation client support application for MATLAB® and R so that EViews may be used to launch or control the application, transfer data, or execute commands.

- The EViews Microsoft Excel® Add-in offers a simple interface for fetching and linking from within Microsoft Excel® (2000 and later) to series and matrix objects stored in EViews workfiles and databases.
- 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.

Features of Stata

Features for economists

Panel data

Take full advantage of the extra information that panel data provide while simultaneously handling the peculiarities of panel data. Study the time-invariant features within each panel, the relationships across panels, and how outcomes of interest change over time. Fit linear models or nonlinear models for binary, count, ordinal, censored, or survival outcomes with fixed-effects, random-effects, or population-averaged estimators. Fit dynamic models or models with endogeneity.

Time series

Handle the statistical challenges inherent to time-series data—autocorrelations, common factors, autoregressive conditional heteroskedasticity, unit roots, cointegration, and much more. Analyze univariate time series using ARIMA, ARFIMA, Markov-switching models, ARCH and GARCH models, and unobserved-components models. Analyze multivariate time series using VAR, structural VAR, VEC, multivariate GARCH, dynamic-factor models, and state-space models. Compute and graph impulse responses. Test for unit roots.

Cross-sectional models

Fit classical linear models of the relationship between a continuous outcome, such as wage, and the determinants of wage, such as education level, age, experience, and economic sector. If your response is binary (for example, employed or unemployed), ordinal (education level), count (number of children), or censored (ticket sales in an existing venue), don't worry. Stata has maximum likelihood estimators—probit, ordered probit, Poisson, tobit, and many others—that estimate the relationship between such outcomes and their determinants. A vast array of tools is available to analyze such models. Predict outcomes and their confidence intervals. Test equality of parameters, or any linear or nonlinear combination of parameters.

Endogeneity and selection

When explanatory variables are related to omitted observable variables, or when they are related to unobservable variables, or when there is selection bias, then causal relationships are confounded and parameter estimates from standard estimators produce inconsistent

estimates of the true relationships. Stata can fit consistent models when there is such endogeneity or selection—whether your outcome variable is continuous, binary, count, or ordinal and whether your data are cross-sectional or panel. Stata can even combine endogenous covariates, selection, and treatment effects in the same model.

Treatment effects

Estimate experimental-style causal effects from observational data. For instance, the effect of a job training program on employment or the effect of a subsidy on production. Fit models for continuous, binary, count, fractional, and survival outcomes with binary or multivalued treatments using inverse-probability weighting (IPW), propensity-score matching, nearestneighbor matching, regression adjustment, or doubly robust estimators. Fit models with exogenous or endogenous treatments. After estimation, test the overlap assumption and covariate balance. Even add endogenous covariates and sample selection to some treatmenteffect estimators.

Marginal effects and marginal means

Marginal effects and marginal means let you analyze and visualize the relationships between your outcome variable and your covariates, even when that outcome is binary, count, ordinal, categorical, or censored (tobit). Estimate population-averaged marginal effects or evaluate marginal effects at interesting or representative values of the covariates. Analyze the effect of interactions. You can even trace out the marginal effect over a range of interesting covariate values or covariate interactions. You can do all of this with marginal means (sometimes called potential-outcome means), even when your "mean" is a probability of a positive outcome or a count from a Poisson model. If you have panel data and random effects, these effects are automatically integrated out to provide marginal (that is, population-averaged) effects.

Choice models

Model your discrete choice data. If your outcome is, for instance, a choice to travel by bus, train, car, or airplane, you can fit a conditional logit, multinomial probit, or mixed logit model. Is your outcome instead a ranking of prefered travel methods? Fit a rank-ordered probit or rank-ordered logit model. Regardless of the model fit, you can use the margins to easily interpret the results. Estimate how much wait times at the airport affect the probability of traveling by air or even by train.

GMM

GMM (generalized method of moments) can be used to fit almost any statistical model, including both exactly identified and overidentified estimation problems. Overidentified problems arise when you have endogeneity, correlation in dynamic panels, sample selection, and many other situations. With Stata, you estimate these models by simply writing your moments and enclosing the parameters in curly braces. You can easily fit cross-sectional, time-series, panel-data, or survival-data models and test your overidentifying restrictions.

Lasso

Use lasso and elastic net for model selection and prediction. And when you want to estimate effects and test coefficients for a few variables of interest, inferential methods provide estimates for these variables while using lassos to select from among a potentially large number of control variables. You can even account for endogneours covariates. Whether your goal is model selection, prediction, or inference, you can use Stata's lasso features with your continuous, binary, and count outcomes.

Programming

Want to program your own commands to perform estimation, perform data management, or implement other new features? Stata is programmable, and thousands of Stata users have implemented and published thousands of community-contributed commands. These commands look and act just like official Stata commands and are easily installed for free over the Internet from within Stata. A unique feature of Stata's programming environment is Mata, a fast and compiled language with support for matrix types. Of course, it has all the advanced matrix operations you need. It also has access to the power of LAPACK. What's more, it has built-in solvers and optimizers to make implementing your own maximum likelihood, GMM, or other estimators easier. And you can leverage all of Stata's estimation and other features from within Mata. Many of Stata's official commands are themselves implemented in Mata.

Python integration

Interact Stata code with Python code. You can interchange data between Stata and Python and pass results from Python back to Stata. You can call Python libraries such as NumPy, matplotlib, Scrapy, scikit-learn, and more from Stata.

Forecasting

Build multiequation models, and produce forecasts of levels, trends, rates, etc. Whether you have a small model with a few equations or a complete model of the economy with thousands of equations, Stata can help you build that model and produce forecasts. Your model can include both estimated relationships and known identities. You can easily create and compare forecasts under different scenarios, create static and dynamic forecasts, and even estimate stochastic confidence intervals. You can create your model by using an intuitive command syntax or by using the interactive forecasting control panel.

Survival analysis

Analyze duration outcomes—outcomes measuring the time to an event such as failure or death—using Stata's specialized tools for survival analysis. Account for the complications inherent in survival data, such as sometimes not observing the event (censoring), individuals entering the study at differing times (delayed entry), and individuals who are not continuously observed throughout the study (gaps). You can estimate and plot the probability of survival over time. Or model survival as a function of covariates using Cox, Weibull, lognormal, and other regression models. Predict hazard ratios, mean survival time, and survival probabilities. Do you have groups of individuals in your study? Adjust for withingroup correlation with a random-effects or shared frailty model.

Bayesian analysis

Fit Bayesian regression models using one of the Markov chain Monte Carlo (MCMC) methods. You can choose from a variety of supported models or even program your own. Extensive tools are available to check convergence, including multiple chains. Compute posterior mean estimates and credible intervals for model parameters and functions of model parameters. You can perform both interval- and model-based hypothesis testing. Compare models using Bayes factors. Compute model fit using posterior predictive values. Generate predictions.

Survey methods

Whether your data require a simple weighted adjustment because of differential sampling rates or you have data from a complex multistage survey, Stata's survey features can provide you with correct standard errors and confidence intervals for your inferences. Simply specify the relevant characteristics of your sampling design, such as sampling weights (including weights at multiple stages), clustering (at one, two, or more stages), stratification, and poststratification. After that, most of Stata's estimation commands can adjust their estimates to correct for your sampling design.

Meta-analysis

Combine results of multiple studies to estimate an overall effect. Use forest plots to visualize results. Use subgroup analysis and meta-regression to explore study heterogeneity. Use funnel plots and formal tests to explore publication bias and small-study effects. Use trimand-fill analysis to assess the impact of publication bias on results. Perform cumulative metaanalysis. Use the meta suite, or let the Control Panel interface guide you through your entire meta-analysis.

Automated reporting and dynamic document generation

Stata is designed for reproducible research, including the ability to create dynamic documents incorporating your analysis results. Create Word or PDF files, populate Excel worksheets with results and format them to your liking, and mix Markdown, HTML, Stata results, and Stata graphs, all from within Stata.