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Teach Yourself E-Views

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Abstract: *Introduction E-views, stands for Econometric Views. EViews is a statistical package for Windows, used mainly for time-series oriented econometric analysis. It is developed by Quantitative Micro Software, now a part of IHS. EViews offers researchers and students access to general statistical analysis and econometric analyses, such as cross-section and panel data analysis and time series estimation and forecasting. EViews combines spreadsheet and relational database technology with the traditional tasks found in statistical software. A dummy variable for holidays is also considered. We have developed models for two levels of period to analyze demand characteristics, that is, half year models and seasonal models. It is developed by Quantitative Micro Software (QMS), now a part of IHS. Version 1.0 was released in March 1994, and replaced MicroTSP.*

Keywords: E-views, Data analysis, correlation analysis and regression analysis

The TSP software and programming language had been originally developed by Robert Hall in 1965. The current version of EViews is 13, released in August 2022.

- Data Analysis and Evaluation
- Regression
- Forecasting
- Simulation

What you have to know.

- How to import data into E-views from Excel and typing data directly in E-views.
- Examining data and performing statistical analysis.
- Using regression analysis to model and forecast a statistical relationship.
- Performing hypothesis testing.
- Plotting results.

Common terminologies.

The following terminologies are interchangeably used while referring to the dependent variable Y and independent variables in the regression model.

Y X1, X2... Xk

Dependent variable

Independent variables

Explained variable

Explanatory variables

Response variable Control variables

Predicted variable Predictor variables

Endogenous

Exogenous

Regress and Regressors/Covariates

Left- hand variable Right- hand variable

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Starting E-views

There are several ways to launch E-views on your computer: Click on the Start button in the taskbar, then select Programs, E-views 3, then select the E-views 3.1 icon.

Double click on the E-views 3.1 icon

Double click on an E-views work

file or database icon.

The E-views

Window When you correctly launch the program, the E-views window should look like this:

The Title Bar is at the very top of the main window with, labeled E-views. When this bar is highlighted, E-views is the active program in Windows.

The Main Menu:

It is located right below the title bar. There are drop-down menus where you can find available functions of E-views for the current work file. Click on a word in the drop-down menu and select the highlighted item. The Command Window is below the menu bar and displays as a white panel. You can type an E-views command in this window, then hit ENTER to execute the command.

The Work Area is in the middle of the window where E-views will display the various object windows that it creates.

Entering data This is done mainly in three ways.

- Entering data directly
- Copying from excel
- Importing data

Entering data directly

To enter the data into a format similar to the spreadsheets you have become familiar with, click on Quick in the title bar, and then on Empty Group (Edit Series).

Next enter the variables, starting with the name, in the grey box to the immediate right of “obs.” (Click on the grey box and enter first “age” and “sex” in the adjacent one to the right.)

Note. Entering data in this way is very tedious, and you will make data input errors frequently. You will see below how to enter data directly from a spreadsheet or an ASCII file, which are the most common forms of data you will receive in the future.

Example Given the data,

Y	INFLA
3.6033	2.7347
3.2051	2.4168
2.6109	-0.6701
2.1425	1.0185
2.2776	1.5723
3.2459	1.6408
3.7903	0.2907
4.4144	0.5866

3.2086	5.9651
2.039	2.3244
2.3239	3.4716
3.6033	5.3316
3.2051	5.0488
2.6109	7.3459
2.1425	3.0168
2.2776	3.4592

Create a Work file

 Click on the File menu,

 then on New,

 and on Work file - the most important object container in E-views, which can be used to store data

 In the window appeared:

 Choose the type of your data. For example, you can select “Annual” for time-series data

 Input the start and end dates of your data e.g 2021 and 2022

 Click OK.

The work file now contains two entries:

 c – constant, where E-views saves the intercept of the regression

 resid– residuals, where E-views saves the residuals of last regression

To enter data directly in E-views

 click on Quick in the title bar,

 Then on Empty Group (Edit Series).

 You are in a blank spreadsheet-like work file to enter your data.

Renaming the column heading

 Next enter the variables, starting with the name, in the grey box to the immediate right of “obs.” (Click on the grey box and enter the first variable and “the next variable” in the adjacent one to the right.) Or

 Click the heading as you if want to highlight the whole column, then type y in the formula bar and enter

Copying data from excel

 Copy the data with the headings but leave the column for years

 Open E-views blank worksheet-

 Click and highlight the first column

 Edit

 Paste

Importing data

Import data using CSV

 Make sure the observations for different variables are arranged in columns, with names on top. Remember the number of columns.

 Save the file as a comma delimited (CSV) and give it a name nelson kelly

 Close the excel sheet

 Open E-views.

 Create a new work file

 Click Procs or file,

 Click on import

 Read Text-Lotus-Excel,

 Then browse for location the CSV file called nelson kelly.

 In the dialog box of names of series or number of series if names in files, type the number of variables or type in the variable names.e.g. g 4 or Year, inflation, Man days and p-infla

 Click OK

Import data using Excel

 Make sure the observations for different variables are arranged in columns,

 Do not put any titles or names to the columns that is Delete row with names of the variables

 Save this file as ".xls" file) and give it a name nelson kelly, use excel 97-2003

 Close the excel sheet

 Open E-views.

 Create a new workfile.

 Select File >Import >Read Text-Lotus-Excel.

 At the bottom of the dialog box, change "Files of type" to "Excel (*.xls)" so that you can see the file.

 Then browse to find your data.

 Change B1 to A1

 In the dialog box of Names of series: write the name of the series you are importing in the right order, for example INFLA, Man days and p-infla

 Click Ok

Editing and saving data Edit data

 Click the Edit+/-button on the work file toolbar

 Move to the observation in question,

 Enter the correct value, and press Enter.

Paste data into word file

 click freeze,

 Then you can copy and paste in the word document

 Where you will make your interpretations.

Save data

 Save an entire workfile:

 click Save in the workfile toolbar,

 or click on File and then Save As in the main menu.

View data

One variable – double click on variable in work file window

Or Click on view

Multiple variables

 In work file window, select the name of variables needed,

 Press control and the desired variable

 Right click and choose "open group view

Editing the decimal places

 In work file window, select the name of variables needed,

 Press control and the desired variable

 Right click and choose "open group view

 Click on freeze

 Click on number

 Click on fixed decimal point and put zero

 Click Ok

 Click on name

 Under name to identify the object, type in the name

 Click Ok

DATA ANALYSIS

Summary Statistics

To get the descriptive statistics

 Highlight the variables of interest,

 Click quick

 Group statistics

 Descriptive statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Y	51	-.1373	6.6566	2.365624	1.6874184	.170	.333	-.042	.656
INFLA	37	-6.4709	8.1381	2.404395	2.9158252	-.755	.388	1.615	.759
Valid N (listwise)	37								

 Common samples

 Click ok Graphical Presentations

 Highlight the variables of interest,

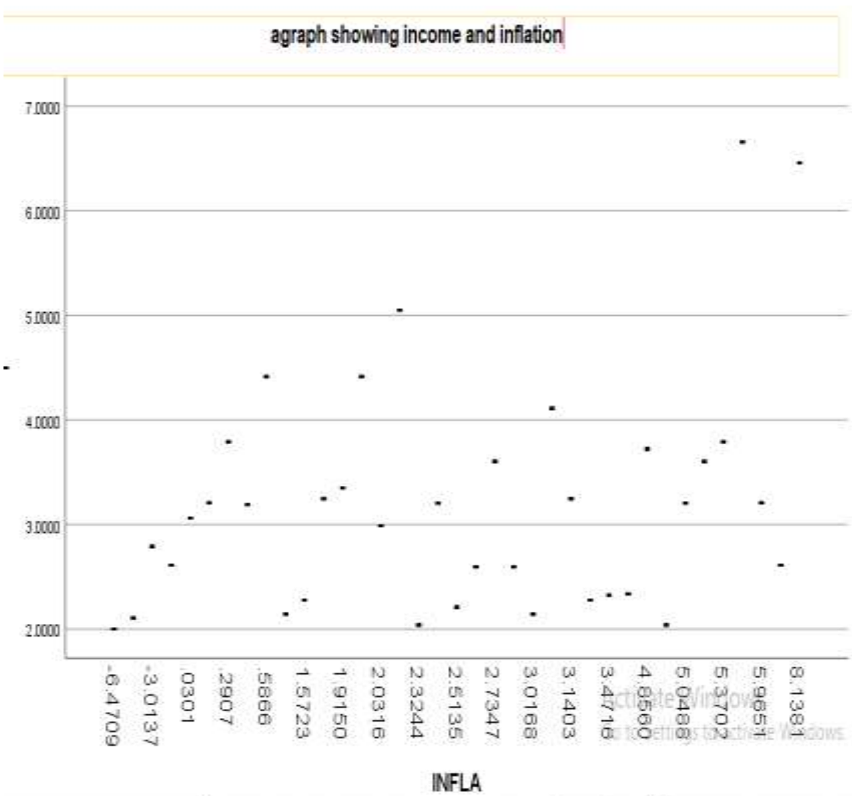
 Click quick

 Click Graph, click ok

 Select the desired graph type

 Click ok

 Click on name to name the graph



Generating new variables

 Click quick

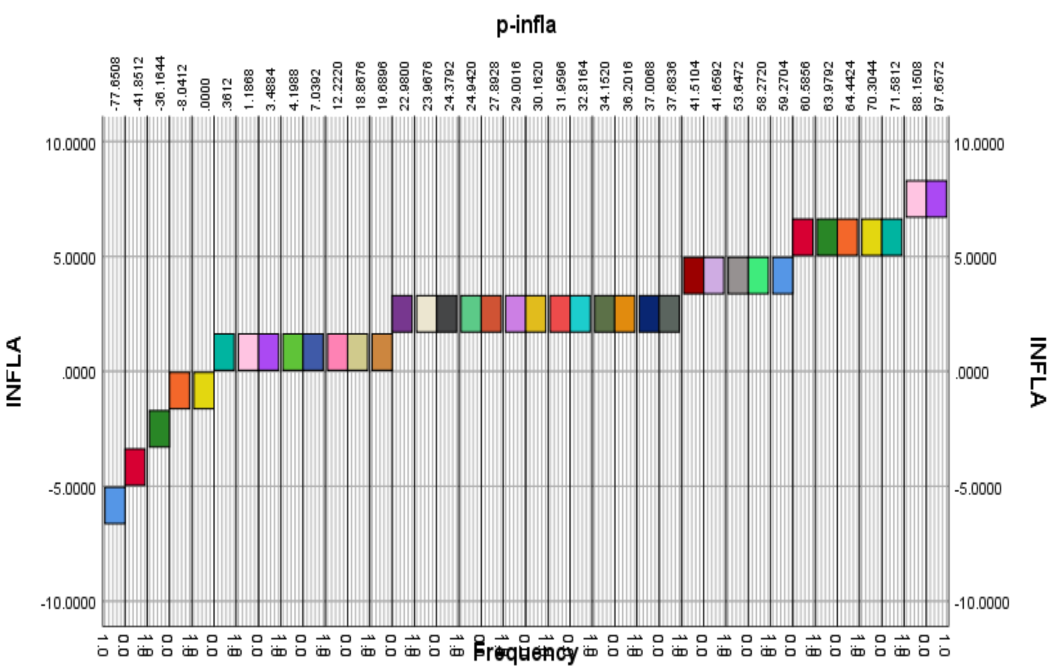
 Select generate series

 Enter equation. E.g type logp= log(p) or age in months =infla *12

Example calculate the growth rate of INFLA

- Click quick
- Select generate series
- create a lagged variable of INFLA. NAME IT P (INFLA)
- Enter equation. E.g type lag (INFLA)= INFLA (-1)
- Click quick
- Select generate series
- Enter equation. p(INFLA)= (INFLA-lag (INFLA)/lag (INFLA)

a pyramid showing the growth rate of inflation



Simple regression

- In main E-views window,
- click Quick,
- then Estimate Equation
- Input the name of the variables, First is the dependent variable, then write down all independent variables. (e.g: Y c X1 X2 … Xk)
- interpret the coefficient

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a. Dependent Variable: Y

b. Predictors: (Constant), INFLA

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.808	.219		12.808	.000
	INFLA	.153	.059	.395	2.579	.014

a. Dependent Variable: Y

Regression with dummies

 Capture data in excel.

 Generate dummies in excel using if function.

 Import or copy to E-views.

 Regress

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.808	.219		12.808	.000
	p-infla	.013	.005	.395	2.579	.014

a. Dependent Variable: Y

Saving equation

Use Name Option

Exporting table of results

 Click Freeze

 select the table

 then copy and choose “formatted”,

 Thus, paste in word document for interpretation of the results.

Exporting a graph

 Click edit

 select copy

 Thus, paste in word document for interpretation of the graph

Correlation analysis

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 Click Quick

 Group statistics

 Correlations.

 Type the variables say: P, Q

 Click Ok

Interpret the correlation coefficient.

Correlations

		Y	INFLA	p-infla
Y	Pearson Correlation	1	.395*	.395*
	Sig. (2-tailed)		.014	.014
	N	51	38	38
INFLA	Pearson Correlation	.395*	1	1.000**
	Sig. (2-tailed)	.014		.000
	N	38	38	38
p-infla	Pearson Correlation	.395*	1.000**	1
	Sig. (2-tailed)	.014	.000	
	N	38	38	38

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Ho: There is no relationship between inflation and income

Ha: There is a relationship between inflation and income

Ho: There is no relationship between P-infla and income

Ha: There is a relationship between P-infla and income

The correlation coefficient (0.395) which indicates a weak positive relationship between inflation, P-infla and income. This is statistically significant at 95% confidence interval and therefore we reject the null hypothesis since P-value (0.00) is less than 0.05 and thus the null hypothesis is rejected and conclusion reached that there is a weak Positive relationship between inflation, P-infla and income

Computing covariance

 Click Quick

 Group statistics

 covariances

 Type the variables say: y x

 Click Ok

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Computing partial coefficients and partial correlation coefficient Consider variables man days and p-infla

 Regress man days on a constant and other variable except capital input

 Generate anew variable G1

 Click Quick>>generate series>>G1=resid

 Click Ok.

Partial Corr

Correlations

Control Variables			Y	INFLA
p-infla	Y	Correlation	1.000	.
		Significance (2-tailed)	.	.
		df	0	35
	INFLA	Correlation	.	1.000
		Significance (2-tailed)	.	.
		df	35	0

 Regress p-inflation a constant and other variable except man days

 Generate a new variable B3

 Click Quick>>generate series>>B3=resid

 Click Ok.

 Then regress G1 on a constant (c) and B3

 The coefficient of B3 is the partial coefficient between man days and capita input

 The partial correlation coefficient is obtained by running a correlation between G1 and B3

Producing a scatter plot

 Select variables

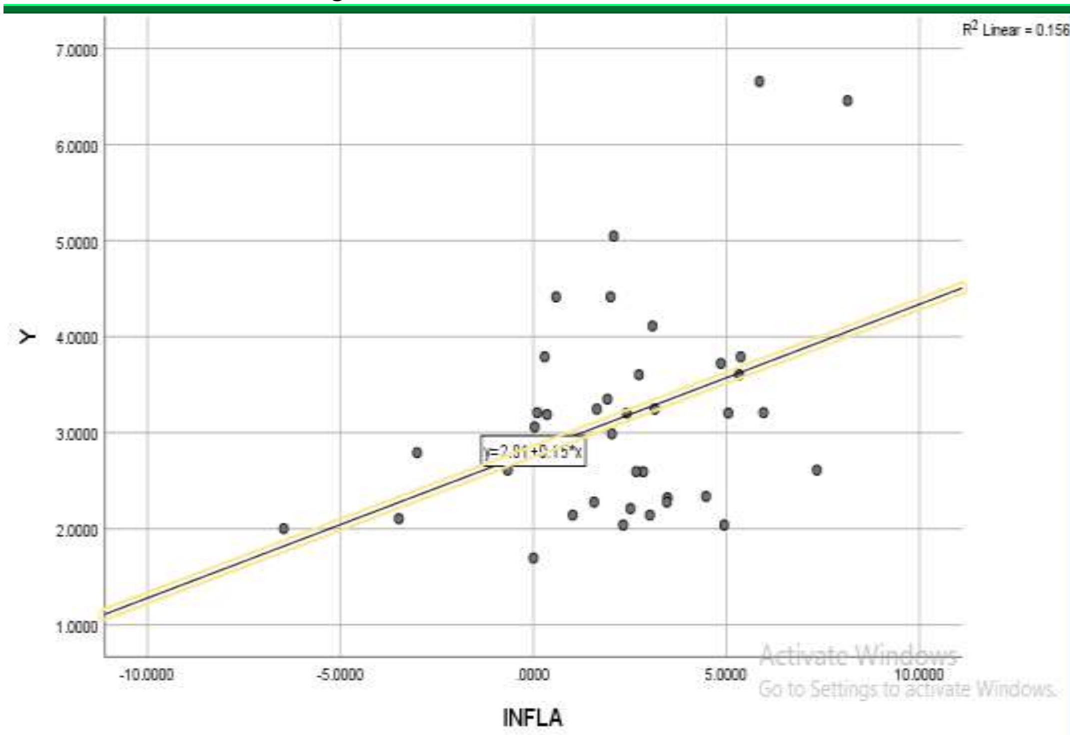
 Click Quick

 Graph

 Select scatter

 To include the regression line, click on show options>> select regression line

 Click ok



Performing the different Test after running the regression

- Click View/Coefficient Tests/Wald-Coefficient Restrictions.
- View results in the equation window:
- Regression output: click View, then Estimation output
- Residuals: click View, then Actual, Fitted residual

From the equation $Y=\beta_0+\beta_1\Delta x_1+\beta_2\Delta x_2+\beta_3\Delta x_3+\varepsilon_i$
The final equation is

$Y = 104.0923-0.0293071 x_1+ 0.3394709 x_2-0.0557291 x_3+ \varepsilon_i$
Testing for normality

- To test for the normality of variables in the model,
- Use the Jarque-Bera statistics probability which must be greater than 0 for acceptance of normality

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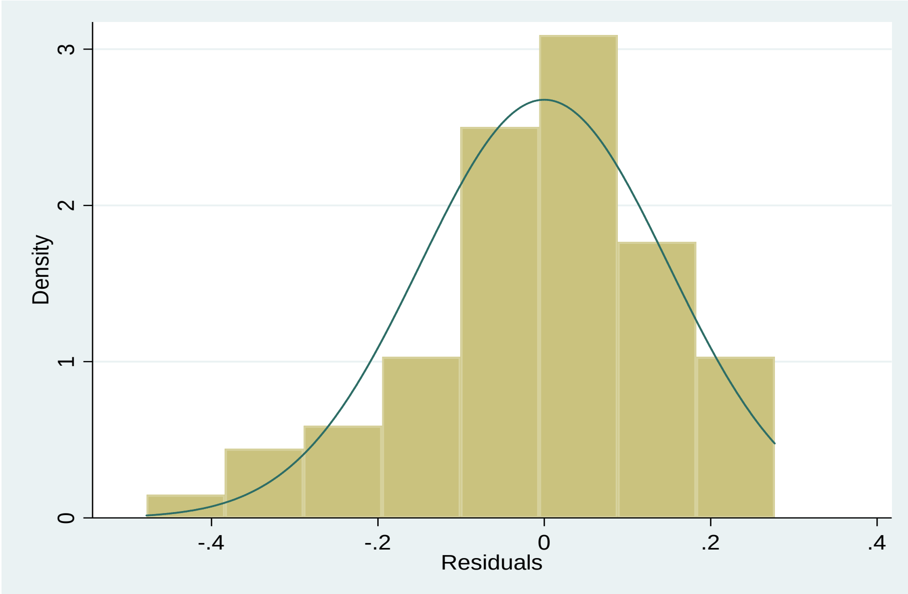
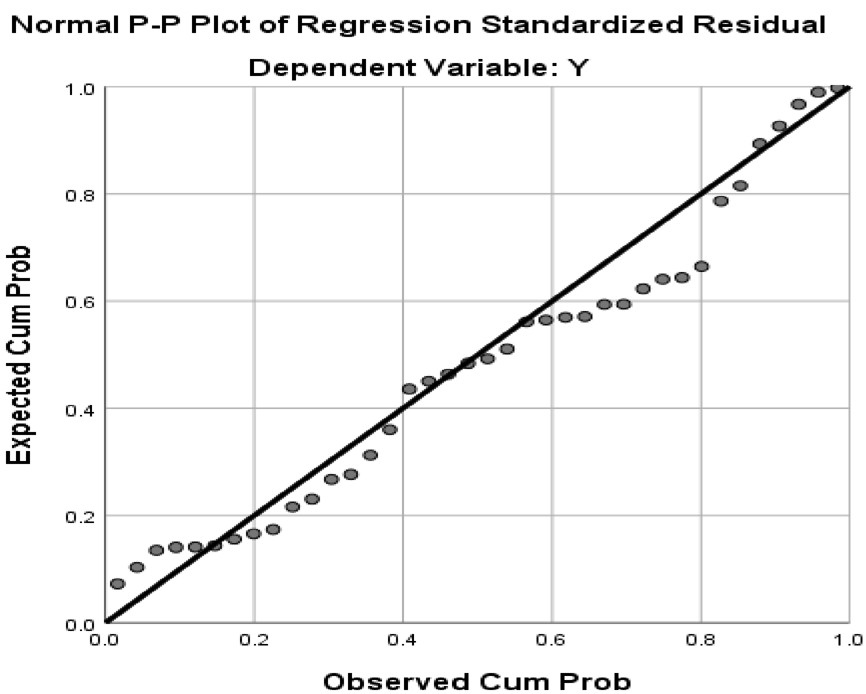




 A high p- value is preferred, 10 and above is preferred

 Note always multiply the probability by 100.

 If the p-value is 0.0000, we say there is no normality at all,

 0.0123 we say there is weak normality so long as the %< 10.

Hypotheses

Ho: the variables are not normally distributed/ there is no normality.

Ha: the variables are normally distributed/ there is normality.

To get the Jarque-Bera statistics

 Select all the variables (exclude the constant and resd)

 Quick

 Group stat

 Descriptive stat

 Common sample

 Click ok.

Please note

 If R-square is far>DW, suspect the result to be spurious/nonsense

 DW-measures autocorrelation, for your data to free of autocorrelation,

 DW should be approximately 2 preferably 2 and above.

 For a particular variable to be significant in the model, the t-statistics>2

 The F-statistics determine the joint significance of the explanatory variables.

Testing whether the errors in the model are normally distributed

 First run the regression

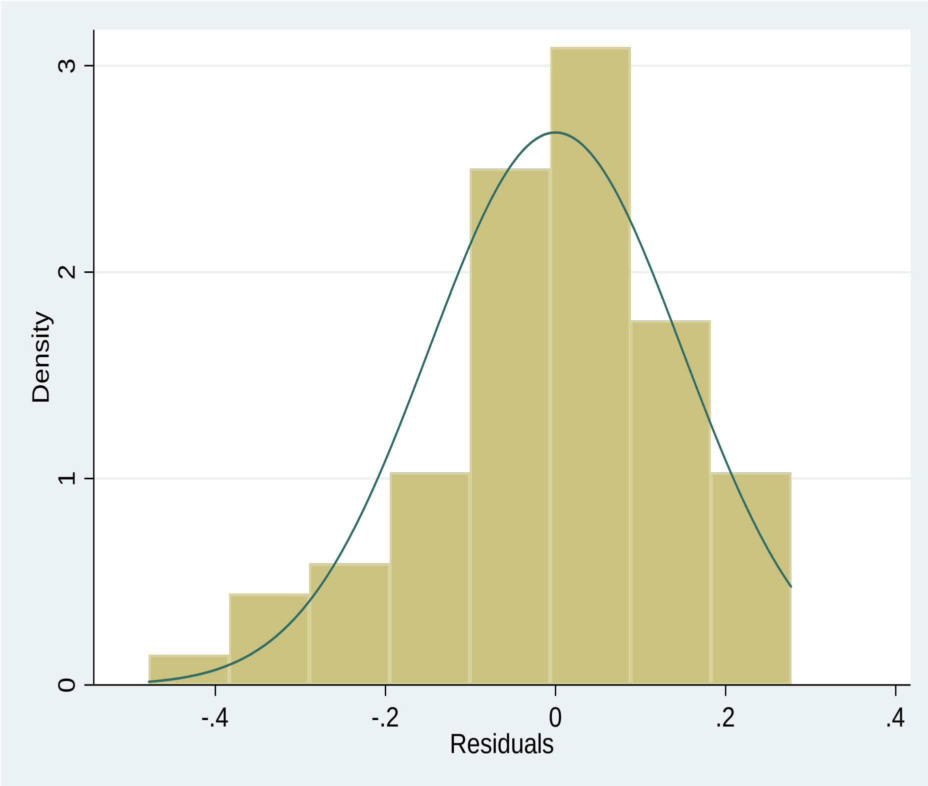
Source	SS	df	MS			
				Number of obs	=	20
				F(3, 16)	=	3.28
Model	292.702422	3	97.5674741	Prob > F	=	0.0485
Residual	476.615567	16	29.7884729	R-squared	=	0.3805
				Adj R-squared	=	0.2643
Total	769.317989	19	40.4904205	Root MSE	=	5.4579

reershsusd	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exptsvol000	-.0293071	.0117411	-2.50	0.024	-.0541972	-.004417
ir	.3394709	.2550865	1.33	0.202	-.2012882	.88023
inflation	-.0557291	.2731489	-0.20	0.841	-.6347788	.5233206
_cons	104.0923	6.020848	17.29	0.000	91.32872	116.856

 Click on view after obtaining the regression model

 Residual tests

 Histogram-normality test



 Conclude either basing on Histogram or Jarque-Bera probability.

Exercise

Below is dataset Q on Y (INCOME) and X1 INFLATION, X2 ir interest rate, X3 export volumes)

Y	INFLA	REER	ir
3.6033	2.7347	32.8164	2.9885
3.2051	2.4168	29.0016	2.5939
2.6109	-0.6701	-8.0412	2.5948
2.1425	1.0185	12.222	2.3372
2.2776	1.5723	18.8676	3.1892
3.2459	1.6408	19.6896	2.7914
3.7903	0.2907	3.4884	2.0018
4.4144	0.5866	7.0392	2.1057
3.2086	5.9651	71.5812	2.2103
2.039	2.3244	27.8928	1.6954
2.3239	3.4716	41.6592	0.105
3.6033	5.3316	63.9792	0.0301
3.2051	5.0488	60.5856	-0.1373
2.6109	7.3459	88.1508	-0.0334
2.1425	3.0168	36.2016	0.0722

2.2776	3.4592	41.5104	0
3.2459	3.1403	37.6836	0
3.7903	5.3702	64.4424	-0.1136
4.4144	1.9973	23.9676	0
3.2086	0.0989	1.1868	0
2.039	4.9392	59.2704	0.0928
3.3492	1.915	22.98	0
5.0474	2.0785	24.942	0.3214
6.6566	5.8587	70.3044	
6.4571	8.1381	97.6572	
4.1108	3.0839	37.0068	
3.7209	4.856	58.272	
3.0603	0.0301	0.3612	

 Enter the above data in excel, save as excel 97-2003 workbook and close.

 Open E-views

File >> new >>work file

 annual-start date (1980)-end date (1990) OR –undated or irregular-start observation (1)-end observation (12)-ok procs >> import >> read text-lotus-excel

 Look for your excel file and open it. The data will be opened in E-views.

Estimating equations

 Click on quick

 Estimate equation-

 Type y c x in the equation specification as below

 Click ok.

Results

Dependent Variable

Table Regressing the dataset Q

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Source	SS	df	MS			
				Number of obs	=	20
				F(3, 16)	=	3.28
Model	292.702422	3	97.5674741	Prob > F	=	0.0485
Residual	476.615567	16	29.7884729	R-squared	=	0.3805
				Adj R-squared	=	0.2643
Total	769.317989	19	40.4904205	Root MSE	=	5.4579

reershsusd	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
exptsvol000	-.0293071	.0117411	-2.50	0.024	-.0541972	-.004417
ir	.3394709	.2550865	1.33	0.202	-.2012882	.88023
inflation	-.0557291	.2731489	-0.20	0.841	-.6347788	.5233206
_cons	104.0923	6.020848	17.29	0.000	91.32872	116.856

Source: E-views output (2022)
From the equation $Y=\beta_0+ \beta_1\Delta x_1+ \beta_2 \Delta x_2 + \beta_3 \Delta x_3+\varepsilon_i$
The final equation is

$Y = 104.0923-0.0293071\ x_1+ 0.3394709\ x_2-0.0557291\ x_3+ \varepsilon_i$

EXPLANATION OF THE FINDINGS.

Goodness of fit.
The model has a good fit (prob>F=0.0485). This is because the P-value (0.0485) is less than the critical value (0.05). This therefore means that the overall independent variables used cause variation in the dependent variable.

The R- squared value.
The value of R-squared value is 0.3805 which implies that 38.1% of the variations in real effective income can be explained by exports, interest rates and inflation. The R-squared value (0.3805) is greater than the adjusted -squared value (0.2643) because it takes degrees of freedom into consideration.

The coefficients.
The value of β_1 (export volumes) is -0.0293071 which lies between the interval -0.0541972 and -0.004417. Therefore, a unit increase in exports will lead to 0.0293071 decrease in real effective income keeping other factors constant. Therefore, there is a significantly negative relationship between real effective income and exports volumes at 95% significant level.

The value of β_2 (interest rates) is 0.3394709 which lies between the interval -0.2012882 and 0.88023 Therefore a unit increase in exports will lead to 0.3394709 increase in real effective income keeping other factors constant.

The value of β_3 (inflation) is -0.0557291 which lies between the interval -0.6347788 and 0.5233206 Therefore a unit increase in inflation will lead to 0.0557291 decrease in real effective income keeping other factors constant.

Probability values for each coefficient.
The p-value for export volumes is 0.024 which is less than the critical value (0.05). This implies that export volumes significantly predict the dependent variable real effective exchange rate

The p-value for interest rates is 0.202 which is greater than the critical value (0.05). This implies that interest rates do not significantly predict the dependent variable real effective exchange rate

The p-value for inflation is 0.841 which is greater than the critical value (0.05). This implies that inflation does not significantly predict the dependent variable real effective exchange rate

Key areas of interpretation

The R-squared value

Constant of the model

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Always remember to include keeping other factors constant in your interpretation.

The P-value

Note. State the hypotheses first.

Close the output and then,

 open x and y as group-

 View

 graph

 scatter with regression

 Click -ok.

Interpret the rest of the variables

ExercisG1

Given the following data;

Y(output), X1 (exchange rate) and X2 (interest rate)

i. Regress output on constant, capital and labour
ii. Interpret the coefficients of capital and labour.
iii. Test for normality of the data
iv. Determine whether your errors in the regression are normal.
v. Through regression of residuals, estimate the partial coefficient and the partial correlation coefficient between capital and labour

Dummy variable regression

Example G1

Below is a hypothetical data on marks(y) of statistics students in a test by sex (1=male, 0=female)

y =22, 19, 18, 21.7, 18.5, 21 ,20.5, 17, 17.5, 21.2

Sex 1, 0, 0, 1, 0, 1, 1, 0, 0, 1,1,1,1,1,10,0,0,0

Regress marks on sex

Capture data in excel

Generate dummies in excel using if function ie dummy for male =if(sex=1,1,0) >> press enter and dfemale =if(sex=0,1,0)

Copy the work into E-views

Run the regression using dataset Q.

Dependent Variable: Y

Method: Least Squares

Date: 06/03/14 Time: 12:24

Sample: 1 10

Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.00000	0.311769	57.73503	0.0000
DMALE	3.280000	0.440908	7.439191	0.0001

R-squared	0.873701	Mean dependent var	19.64000
Adjusted R-squared	0.857913	S.D. dependent var	1.849444
S.E. of regression	0.697137	Akaike info criterion	2.293187
Sum squared resid	3.888000	Schwarz criterion	2.353704
Log likelihood	-9.465934	F-statistic	55.34156
Durbin-Watson stat	0.667284	Prob(F-statistic)	0.000073

Ho: Marks do not depend on sex of the student

Ha: Marks depend on sex of the student

Interpretation

The value of R-squared value is 0.873701 which implies that 83.4% of the variations in real effective income can be explained by gender. The R-squared value (0.873701) is greater than the adjusted -squared value (0.857913) because it takes degrees of freedom into consideration

The estimated mean mark of female statistics students in a test is 18 and that of male statistics students is 21.28(18+3.28).

The coefficient for DMALE (3.28) shows that the male students are more likely to have higher average marks than the female students. This is statistically significant since the P-value (0.0001) <0.05.

The F-probability is statistically significant (0.000073<0.05) thus the null hypothesis is rejected and conclusion made that marks depend on sex of the student.

Exercise

Given the data

Study time 1, 1, 2, 3, 4, 4, 5, 5, 8, 6, 6, 7, 9 ,10, 11, 13, 15, 16, 19, 20

Drug 1, 1, 1, 1, 1, 1, 1 ,1, 2, 2, 2, 2, 2, 2 ,2, 2, 2 ,2, 2

Where 1 is drug type 1 and 2 is drug type 2

(a) Regress study time on drug

(b) Interpret all your results.

Binomial distribution using E-views

 Select all the variables (exclude the constant and resd)

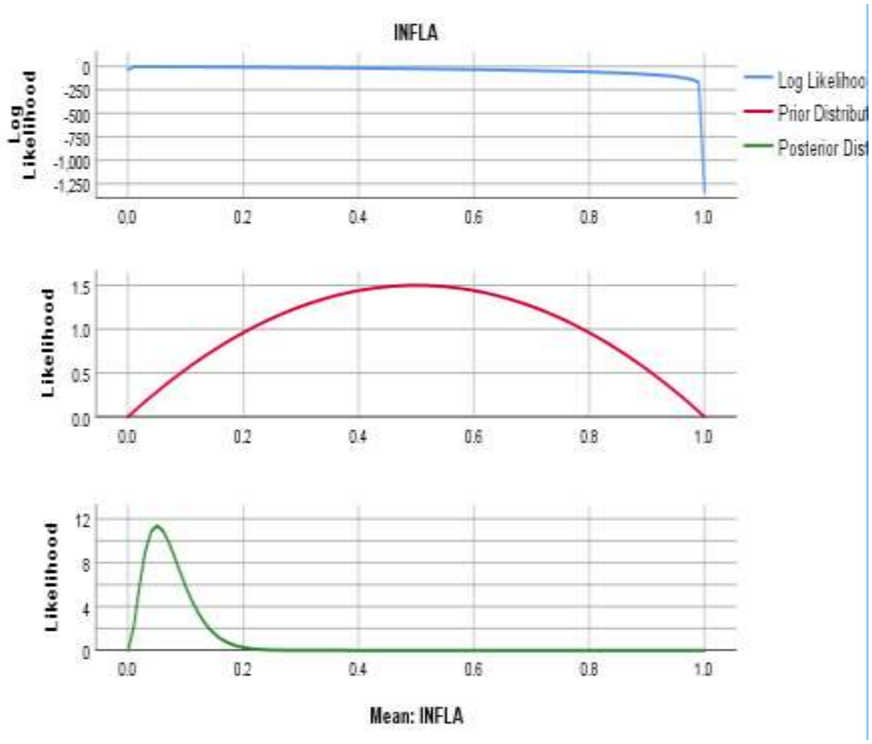
 Quick

 Group stat

 Descriptive stat

 Binomial distribution

 Click ok.



Bayesian Estimates of Coefficients[a,b,c]

Parameter	Posterior Mode	Posterior Mean	Posterior Variance	95% Credible Interval Lower Bound	95% Credible Interval Upper Bound
(Intercept)	2.808	2.808	.051	2.363	3.253
INFLA	.153	.153	.004	.033	.273

a. Dependent Variable: Y

b. Model: (Intercept), INFLA

c. Assume standard reference priors.

The coefficient (0.153) shows that at 95% confidence interval, a one percent increase in inflation would on average increase income by 0.153 given 2.808 as a constant.

Discriminant analysis using E-views

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 Select all the variables (exclude the constant and resd)

 Quick

 Group stat

 Descriptive stat

 Discriminant statistics

 Click ok.

Summary of Canonical Discriminant Functions

Eigenvalues

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.060[a]	100.0	100.0	.238

a. First 1 canonical discriminant functions were used in the analysis.

The linear discriminate analysis projection is obtained as a solution of the generalized eigen value and therefore when the eigen value increases by 0.60, it would on average increase the discriminant function by 0.60 keeping 0.238 canonical correlation constant

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.943	1.689	2	.430

When the wilks' lambda (H) is large compared to the Chi-square (E), we reject the null hypothesis. (When the numerator (H+E) is greater than the denominator (H), we reject the null hypothesis)

NOTE: We reject the null hypothesis when Wilk's lambda is close to 0

Exercise

Given the dataset 1

Study time 1, 1, 2, 3, 4, 4, 5, 5, 8, 6, 6, 7, 9 ,10, 11, 13, 15, 16, 19, 20

Drug 1, 1, 1, 1, 1, 1, 1 ,1, 2, 2, 2, 2, 2, 2 ,2, 2, 2 ,2, 2

Where 1 is drug type 1 and 2 is drug type 2

Calculate the Wilk's lambda test and comment on the results

Testing stationarity using E-views

 Select all the variables (exclude the constant and resd)

 Quick

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 Group stat

 Descriptive stat

 Time series

 Augmented Dickey Fuller Test

 Click ok.

Augmented Dickey-Fuller test for unit root   Number of obs = 18

	Test Statistic	Interpolated Dickey-Fuller 1% Critical Value	5% Critical Value	10% Critical Value
Z(t)	-2.587	-4.380	-3.600	-3.240

MacKinnon approximate p-value for Z(t) = 0.2858

D.inflation	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
inflation						
L1.	-.7447693	.2878662	-2.59	0.022	-1.362181	-.1273578
LD.	-.1239551	.2366374	-0.52	0.609	-.6314917	.3835816
_trend	-.3017252	.2061994	-1.46	0.165	-.7439789	.1405284
_cons	8.591106	3.218159	2.67	0.018	1.688841	15.49337

Results obtained from dataset Q

Ho: Has no unit root
Ha: Has a unit root
The augmented dickey-fuller unit test on the inflation series shows that it is stationary since the p-value (0.2858) is less than the critical value (0.05). We further note that the absolute value for the combined test statistic (2.587) is lower than all the three critical values.
4.55 smoothening the series through the first differences to make them stationary.

Example.

Using the dataset 1 above, test stationarity for income and P-infla.

Durbin Watson test

Computing the Durbin Watson (DW) test

```
. dwstat

Durbin-Watson d-statistic(  4,    20) =  1.052805

.
```

The rule of thumb says that if Durbin Watson (DW) statistic is greater than 2 then there is no evidence of autocorrelation in the residuals. But if DW is less than 2 then there is auto correlation and from the statistic above DW statistic (1.052805) < 2 therefore there is auto correlation.

Quiz. Given the dataset 1 above, compute and interpret the Durbin Watson

Confirmation test for heteroscedasticity using E-Views.

Breusch-Pegan test

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: exptsvol000 ir inflation

         chi2(3)      =     0.41
         Prob > chi2  =   0.9373
```

The chi-square test statistic is 0.41 with 3 degrees of freedom
The p-value is 0.9373 >0.05. Therefore, we accept the null hypothesis and conclude that there is constant variance which means that there is no heteroskedascity but rather there is homoscedasticity

Quiz. Given the dataset 1, interpret the Breush-Pegan test

REFERENCE

Hill, R.C., Griffiths, W.E. and Judge, G.G. (2001