What is EViews?

EViews is a modern econometric, statistics, and forecasting package that offers powerful analytical tools within a flexible, easy-to-use interface. EViews is designed with your workflow in mind. The innovative EViews user-interface simples every step of the process, from data input and import, to data visualization, statistical analysis, estimation, forecasting and model solving, publication quality presentation output.

Uses of E Views

EViews can be used for general statistical analysis and econometric analysis such as cross section and panel data analysis and time series estimation and forecasting. EViews combines spreadsheets and relational database technology with the traditional tasks found in statistical software, uses a windows GUI.

Using EViews, you can quickly and efficiently manage your data. Performing econometric and statistical analysis generates forecasts or model simulations, and produce high quality graphs and tables for publication or inclusion in other applications.

CREATION OF DATA FILE IN EVIEWS

There are two methods of creating data file in EViews:

1. **Import file from excel sheet**
   In this method we need to enter the require data in excel sheet and save the excel sheet and save the excel sheet. Now, open EViews, click on file option →import→ import from file →select the saved Excel file and click open →click next three times and then click finish.
2. **Create file in EViews**
   In this method we need to click on create a new EViews work file → specify the starting date and end date

ESTIMATION OF LINEAR REGRESSION MODEL BY METHOD OF ORDINARY LEAST SQUARES.

Ordinary lest squares (OLS) OR Linear least squares is a method for estimating the unknown parameters in a linear regression model. This method minimise the sum of the squared vertical distances between the observed responses in the dataset and the responses predicted by the linear approximation.

STEPS FOR ESTIMATION OF LINEAR REGRESSION MODEL BY METHOD OF ORDINARY LEAST SQUARES.

Estimation means calculation of statistic values based on sample data to study population characteristics. Regression is a method used to study cause and effect relationship. Regression helps us to get value of dependent variable for independent variable. A simple/ classical regression model deals with 2 variable cases.

Equation of classical regression model Y on X is: Y=a+bX where a is intercept and b is slope. There are two ways to estimate the regression model:

1) Selecting directly the variables

- From the data available on EViews select the dependent variable Y first.
- Press shift and select independent variable (x) too.
- Now double click and from extension select 'open as'.
- From further extension select equation
- A dialog box will appear showing the variables selected.
- Click ok, the estimated equation will be shown.

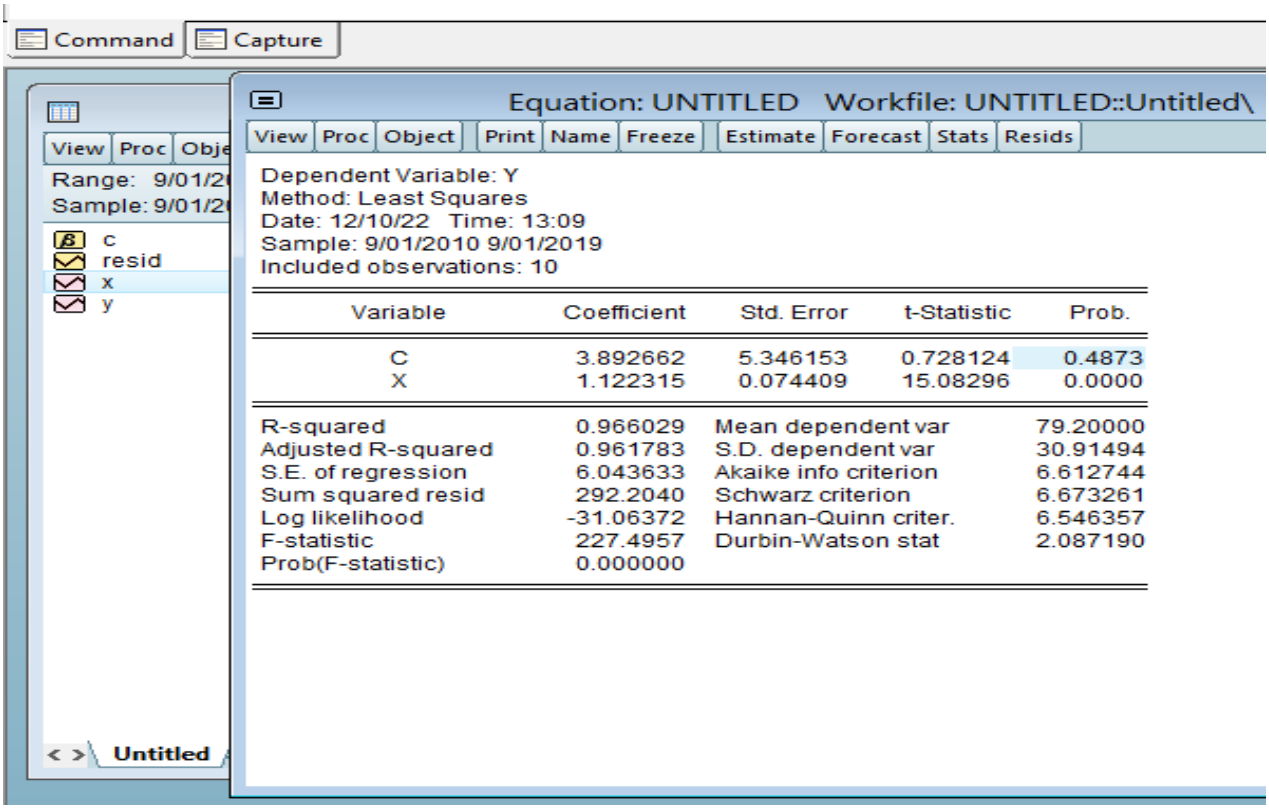
2) Through quick option

- Go to quick option, click on estimate option
- In dialog box for writing equation's variables format , type independent variable (y) space c space independent variable (x)
- Click on ok, the estimated equation will appear on screen.

Let the series of regression model to be estimated and worked upon be:

DATASET

x	Y
24	30
36	45
42	56
54	64
68	73
72	89
89	99
90	102
94	104
102	130



REPORTING OF RESULTS

Reporting the regression equation means systematically arranging the values obtained after estimating the regression equation.

Y = 3.892662 + 1.122315 X

S. E = (5.346153) (0.074409)

T statistic = (0.728124) (15.08296)

Prob = (0.4873) (0.000)

r^2 = (0.966029)

Adjusted r^2= (0.961783)

F-statistic = (227.4957)

Prob = (0.0000)

N = 10

INTERPRETATION OF RESULTS

1) Algebraic signs of regression coefficients

INTERCEPT (C): If x=o then the value of y= 3.8926 units i.e., positive so ,

SLOPE (X): If x increases the dependent variable (y) will also increase

If x changes by 1 unit, y will change or increase by 1.1223 units.

FORMULATION OF NULL HYPOTHESIS

FOR INTERCEPT: **Ho: b1 = 0** the value of b1 is not significant , b1=intercept value

H_1: b1$\neq 0$ the value of b1 is significant

The value of t –statistic is 0.728124 and the related p value is 0.4873. Since the p value which is 0.4873 which is more than 0.05 or 5%, the value of t – statistic is not significant i.e.; we accept our null hypothesis which means b1=0 and we reject our alternate hypothesis that is autonomous value of b1 is significant .

FOR SLOPE: **Ho: b2 = 0** where b2 is slope coefficient,

The value of b2 is not significant i.e., the impact of x on y is not significant

H_1: b2$\neq 0$ the value of b2 is significant i.e., x effects y significantly.

The value of t statistic is 15.08296 and the related p value is 0.00. Since the p value 0.00 is less than 0.05 or 5%, the value of t-statistic is significant and we reject our null hypothesis. So we accept our alternate hypothesis which is **b2**$\neq 0$ i.e., the impact of x on y is significant.

UNIT 2

GOODNESS OF FIT / EXPLANATORY POWER OF MODEL

Explanatory power of regression model is determined by r^2 or adjusted r^2, also called coefficient of determination. It is simply the square of Karl Pearson's correlation coefficient. It explains the variation in dependent variable due to independent variable.

R^2 is a useful tool when it comes to comparison of 2 regression models. Higher the goodness of fit better is the model's explanatory power.

Adjusted r^2 is used when it is not possible to use r^2 because of any of the following 3 reasons:

- If the number of observations in both the models are not same.
- If nature of the dependent variable in both models is not same.
- If the number of independent variables are not same in both the models.

INTERPRETATION

By the above dataset the value of $r^2 = 0.966029$, this means that 96.6029% variation in Y is explained by X and remaining is due to other factors which are unknown.

HYPOTHESIS TESTING:

For hypothesis testing of goodness of fit, Test of Significance approach is used.

Formation of null hypothesis:

Ho: $r^2 = 0$, that means the value of r^2 is not significant.

H_1: $r^2 \neq 0$ that means the value of r^2 is significant.

By the above results, the value of F statistic is 227.4957 and the related p value is 0.00. Since the p value 0.00 is less than 0.05 or 5%, the value of F statistic is significant and we reject our null hypothesis which means the independent variable (x) explains the variation in dependent variable (y). So we accept our alternate hypothesis which is $r^2 \neq 0$**.**

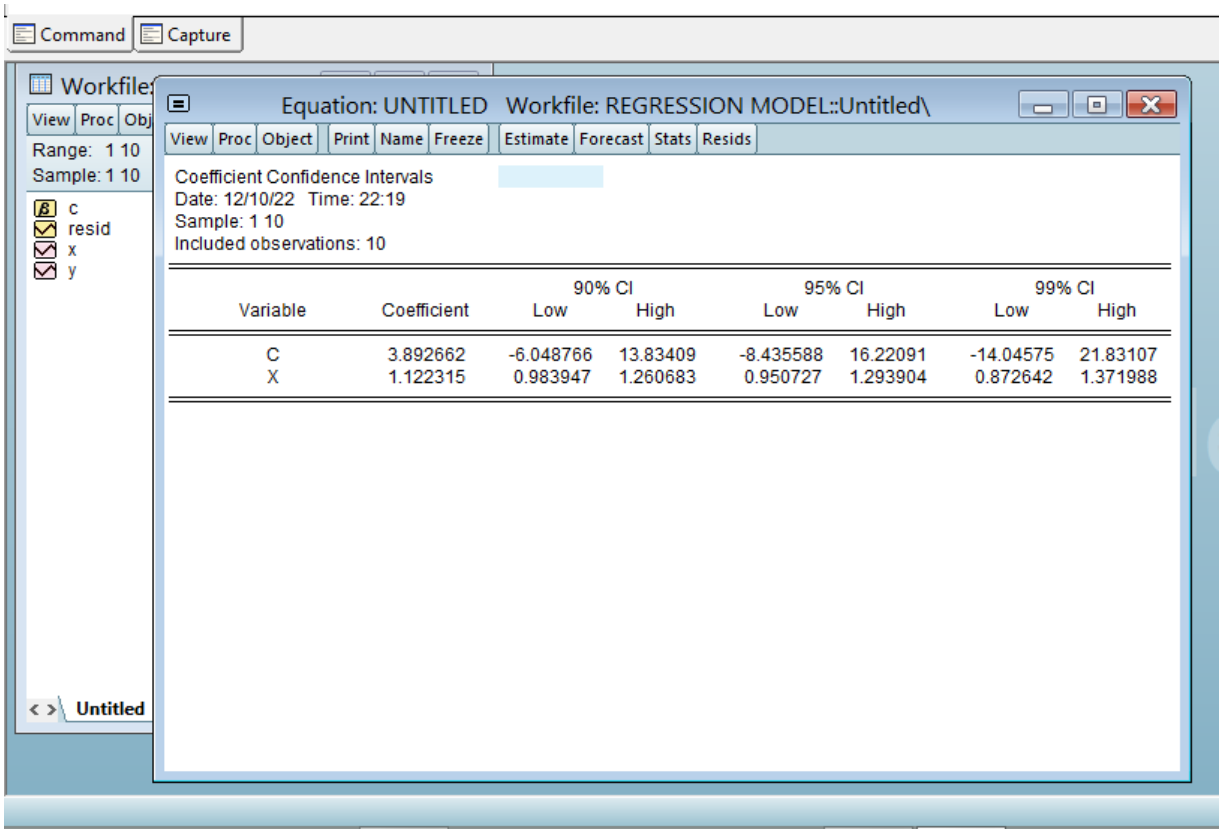
Confidence interval approach

This is another method for testing hypothesis. In this if the value of the coefficient lies in the specified confidence interval, we accept null hypothesis otherwise we reject it.

In EViews the confidence interval is estimated by following steps:

- After estimating equation, go to view→ click coefficient diagnosis by the drop down.
- Click on confidence interval→ a dialog box with 3 different levels of confidence will appear
- Click ok, the confidence interval of 90%,95% and 99% will appear.

Results:



INTERPRETATION OF RESULTS:

Formation of null hypothesis:

H_0: the value of statistic can be termed as same of parameter

H_1: the value of statistic cannot be termed as same of parameter

FOR INTERCEPT

By observing the results we find that the value of coefficient lies inside the confidence interval at 90%, 95% and 99% confidence levels, so we accept our null hypothesis that means this value of intercept can be termed as a true representative of population intercept.

FOR SLOPE:

By observing the results we find that the value of slope coefficient lies inside the confidence interval at 90%, 95% and 99% confidence levels, so we accept our null hypothesis that means this value of slope can be termed as a true representative of population slope value.

Unit 3

Chow Test

A Chow test is a statistical test used to test whether the coefficients in two different regression models on different datasets are equal.

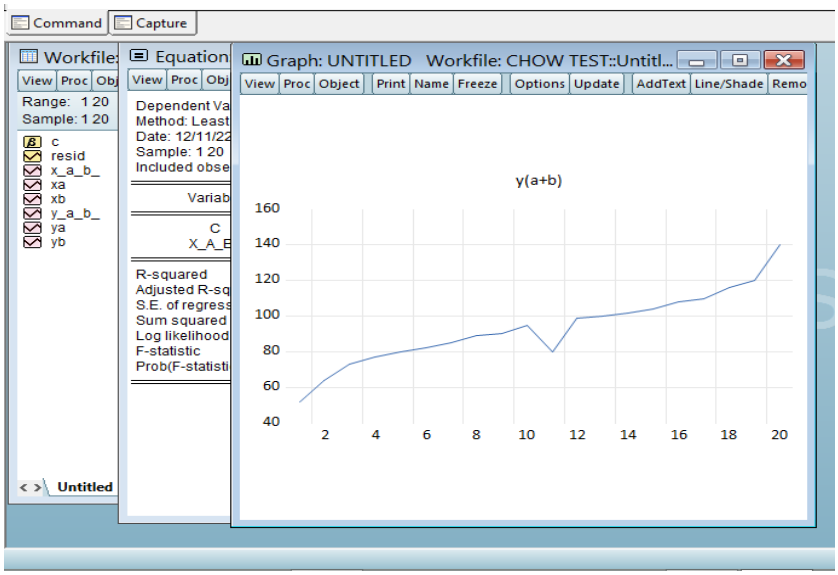
Steps for calculating Chow test

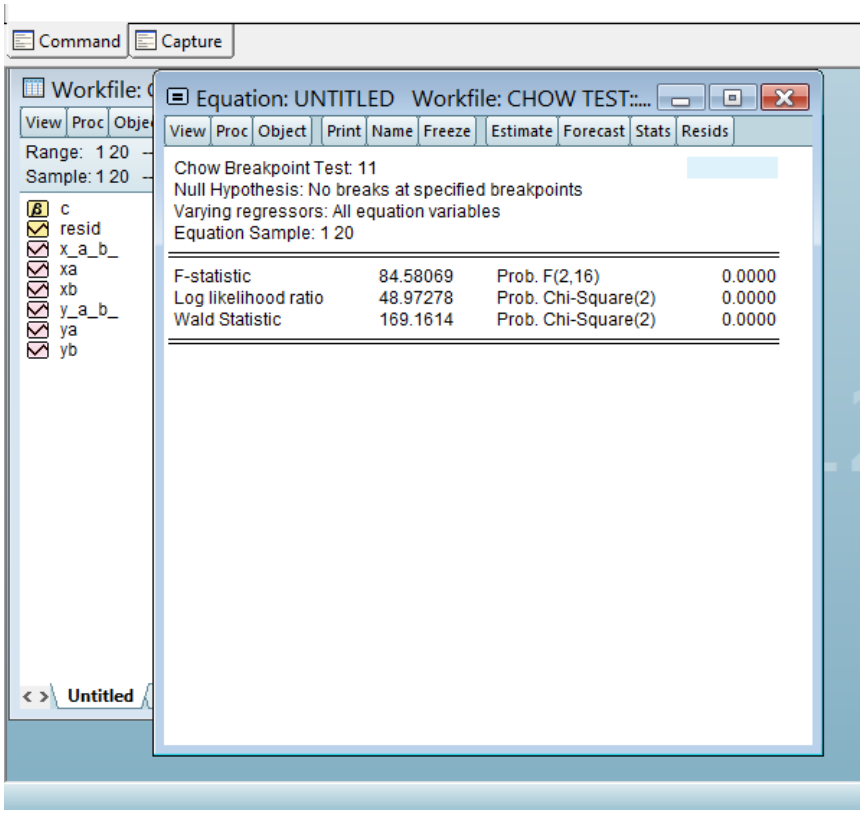
- Generate a datasheet with the series of same case or different such as for Case A(x,y), case B (x,y) and case c X(A+B) , Y (A+B).
- Import the sheet in EViews and estimate the equations separately for Case A , Case B and finally the aggregate equation. Notice the signs of regression coefficients of both cases to be same.
- Now go to view and select stability diagnosis
- Click on chow breakpoint and then type the breakpoint
- Click ok

TABLE

xa	ya	xb	yb	x(a+b)	y(a+b)
23	52	12	80	23	52
25	64	16	99	25	64
29	73	19	100	29	73
30	77	22	102	30	77
35	80	25	104	35	80
39	82	32	108	39	82
40	85	35	110	40	85
42	89	36	116	42	89
48	90	38	120	48	90
52	95	40	140	52	95
				12	80
				16	99
				19	100
				22	102
				25	104
				32	108
				35	110
				36	116
				38	120
				40	140

RESULTS:





INTERPRETATION OF RESULTS:

Both the cases a and b have same algebric signs of coefficients.

From the graph we can see the breakpoint is 11.

The hypothesis testing of chow's test is done by chow's F Test (F-Statistic)

Formulation of null hypothesis:

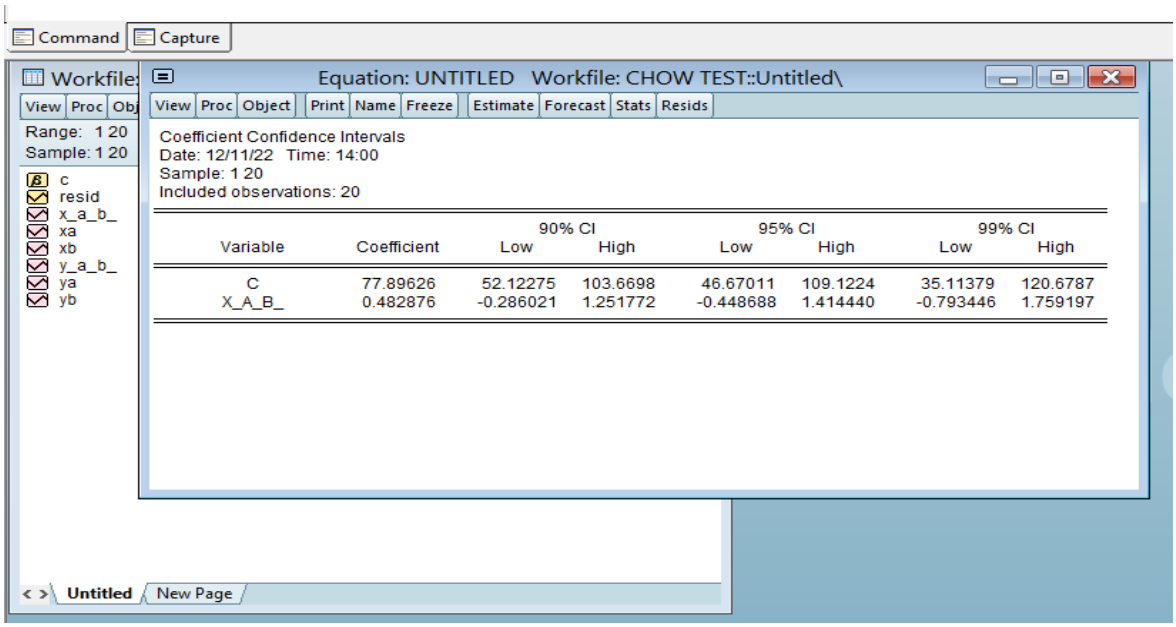
H_0: There is no structural difference between both the cases

H_1: There is structural difference between both the cases

By the above results, the value of F statistic is 84.58069 and the related p value is 0.00. Since the p value 0.00 is less than 0.05 or 5%, the value of F statistic is significant and we reject our null hypothesis. So we accept our alternate hypothesis which means there is structural difference between both the cases.

Hypothesis testing by Confidence Interval Approach

For hypothesis testing of aggregate estimate equation by confidence interval approach, results given by EViews are:



Variable	Coefficient	90% CI Low	90% CI High	95% CI Low	95% CI High	99% CI Low	99% CI High
C	77.89626	52.12275	103.6698	46.67011	109.1224	35.11379	120.6787
X_A_B_	0.482876	-0.286021	1.251772	-0.448688	1.414440	-0.793446	1.759197

INTERPRETATION OF RESULTS:

Formation of null hypothesis:

H_0: the value of statistic can be termed as same of parameter

H_1: the value of statistic cannot be termed as same of parameter

FOR INTERCEPT: By observing the results we find that the value of coefficient lies inside the confidence interval at 90%, 95% and 99% confidence levels, so we accept our null hypothesis that means this value of intercept can be termed as a true representative of population intercept.

FOR SLOPE: By observing the results we find that the value of slope coefficient lies inside the confidence interval at 90%, 95% and 99% confidence levels, so we accept our null hypothesis that means this value of slope can be termed as a true representative of population slope value.

Unit 4

Functional forms

Log linear functional form:

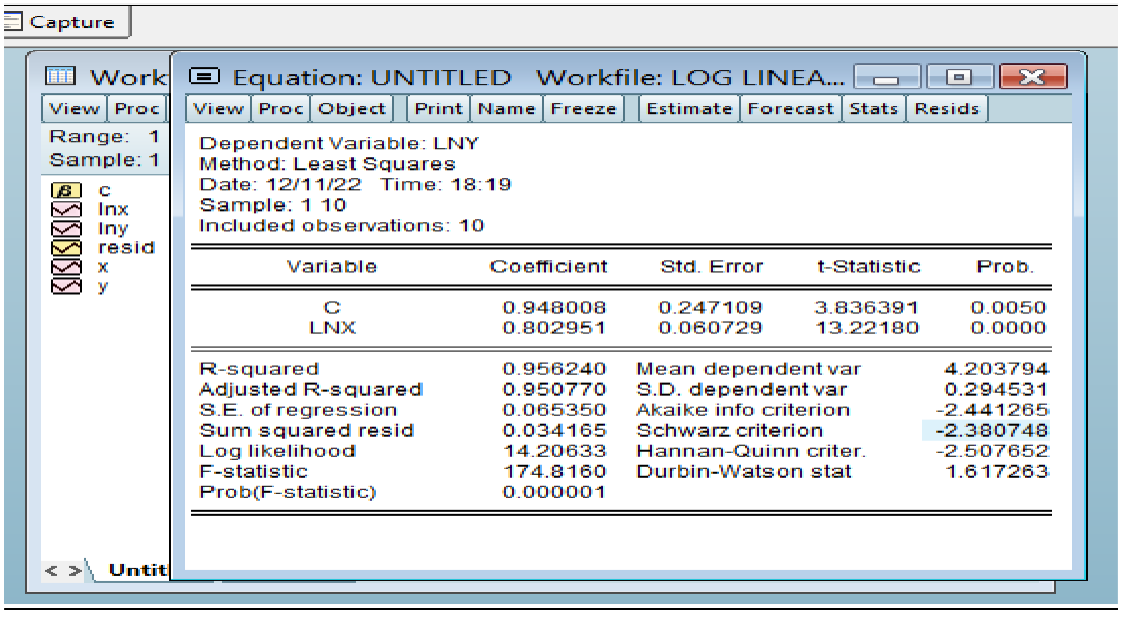
Log linear analysis a technique used in statistics to examine the relationship between more than two categorical variables. Log linear functional form can be written as $Y=ax^b$ since we cannot apply log on both sides of the equation such that lny= A+B lnX where A= lna .

Steps for estimation of Log Linear Functional form

Create an excel sheet with data series of x ,y, Log of x (lnx) , log of y (lny) and import the excel sheet to EViews → click on Quick , then estimate equation then type dependent variable first then independent log data series → click ok .The desired results will appear.

Dataset

X	Y	LNX	LNY
32	45	3.465736	3.806662
38	48	3.637586	3.871201
45	50	3.806662	3.912023
48	56	3.871201	4.025352
55	68	4.007333	4.219508
64	69	4.158883	4.234107
72	74	4.276666	4.304065
78	88	4.356709	4.477337
80	94	4.382027	4.543295
98	104	4.584967	4.644391



REPORTING OF RESULTS

Reporting the regression equation means systematically arranging the values obtained after estimating the regression equation.

Y = 0.948008 + 0.802951X

S.E = (0.247109) (0.060729)

T statistic = (3.836391) (13.22180)

Prob = (0.0050) (0.000)

r^2 = (0.956240)

Adjusted r^2= (0.950770)

F-statistic = (174.8160)

Prob = (0.000001)

N = 10

INTERPRETATION OF RESULTS:

The intercept of Log-Linear functional form is positive. If the value of independent variable X=0 then the value of dependent variable Y=0.948008 units and the slope coefficient is also positive which states that if the independent variable increases by 1 unit the dependent variable will also increase by 0.802951

Formulation of null hypothesis:

H_0: $b_1=0$ (test statistic is not significant)

H_1: $b_1\neq0$ (test statistic is significant)

For intercept:

From the above example we can say that the value of t statistic is 3.83 and the related prob value is 0.05% which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

For slope:

From the above example we can say that the value of t statistic is 13.22 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

Formulation of hypothesis for r^2

H_0: r^2 =0 which means test statistic is not significant

H_1: $r^2 \neq 0$ which means test statistic is significant

In this case that the value of F statistic is 174.8160 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant and independent variable explains the variation in the dependent variable significantly.

SEMI LOG MODELS

LOG LIN FUNCTIONAL FORMS

A Log Linear model is a mathematical model that takes the form of a function whose logarithm equals in a linear combination of the parameters of the parameters of the model, which makes it possible to apply linear regression. It is of the form Iny= a +bx.

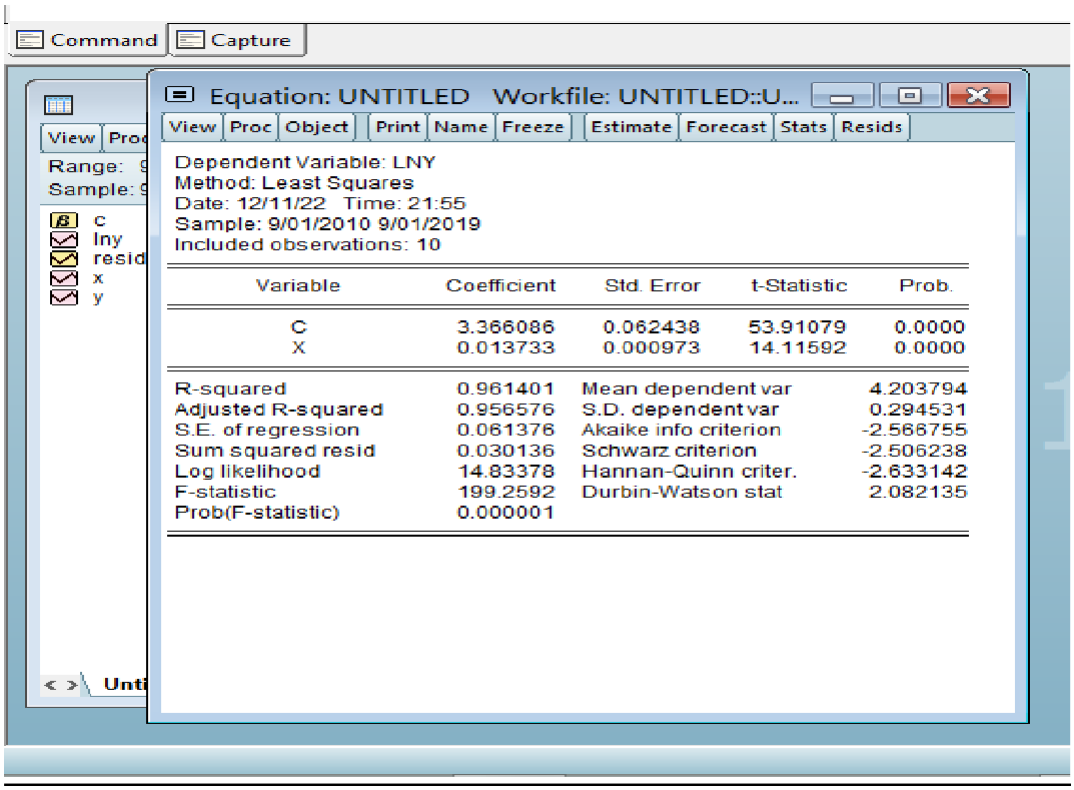
Steps for estimation of Log Lin Model

Create an excel sheet with data series of x ,y, Log of y(Iny) and import the excel sheet to EViews →Click on Quick, then estimate equation then type first the dependent variable(Iny) and then c and then independent variable (x) and click 'OK', the desired results will appear.

TABLE

X	Y	LNY
32	45	3.806662
38	48	3.871201
45	50	3.912023
48	56	4.025352
55	68	4.219508
64	69	4.234107
72	74	4.304065
78	88	4.477337
80	94	4.543295
98	104	4.644391

RESULTS:



REPORTING OF RESULTS

Reporting the regression equation means systematically arranging the values obtained after estimating the regression equation.

LNY = 3.366086 + 0.013733X

S.E = (0.062438) (0.000973)

T statistic = (53.91079) (14.11592)

Prob = (0.000) (0.000)

r^2 = (0.961401)

Adjusted r^2= (0.956576)

F-statistic = (199.2592)

Prob = (0.000001)

N = 10

INTERPRETATION OF RESULTS:

The intercept of Log-Lin functional form is positive. If the value of independent variable X=0 then the value of dependent variable lnY =3.366086 units and the slope coefficient is also positive which states that if the independent variable increases by 1 unit the dependent variable will also increase by 0.013733

Formulation of null hypothesis:

H_0: b_1=0 (test statistic is not significant)

H_1: $b_1 \neq 0$ (test statistic is significant)

For intercept:

From the above example we can say that the value of test statistic is 53.91079 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

For slope:

From the above example we can say that the value of test statistic is 14.11592 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

Formulation of hypothesis for r^2

H_0: r^2 =0 which means test statistic is not significant

H_1: $r^2 \neq 0$ which means test statistic is significant

In this case that the value of F statistic is 199.2592 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant and independent variable explains the variation in the dependent variable significantly.

LIN LOG FUNCTIONAL FORMS

Estimating a linear-log model, the coefficients can be used to determine the impact of your independent variables (*X*) on your dependent variable (*Y*). The coefficients in a linear-log model represent the estimated unit change in your dependent variable for a percentage change in your independent variable.

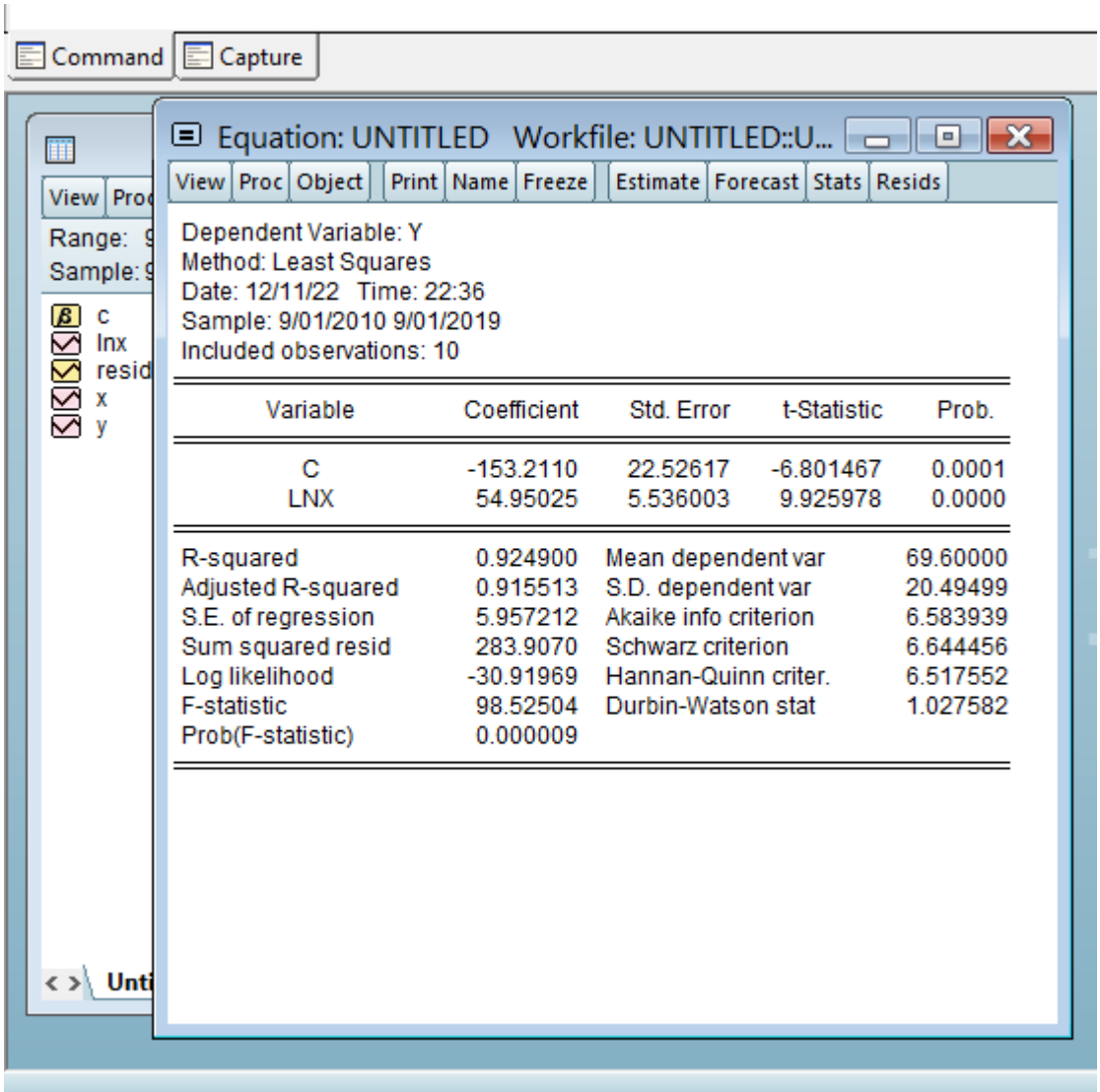
Steps for estimation of Lin Log Model

Create an excel sheet with data series of x ,y, Log of x(lnx) and import the excel sheet to EViews →Click on Quick, then estimate equation then type first the dependent variable Y and then c and then log of independent variable (lnx) and click 'OK', the desired results will appear.

TABLE:

X	Y	LNX
32	45	3.465736
38	48	3.637586
45	50	3.806662
48	56	3.871201
55	68	4.007333
64	69	4.158883
72	74	4.276666
78	88	4.356709
80	94	4.382027
98	104	4.584967

RESULTS:



REPORTING OF RESULTS:

Reporting the regression equation means systematically arranging the values obtained after estimating the regression equation.

LNY = -153.2110 + 54.95025X

S.E = (22.52617) (5.536003

T statistic = (-6.801467) (9.925978)

Prob = (0.0001 (0.000)

r^2 = (0.924900)

Adjusted r^2= (0.915513)

F-statistic = (98.52504)

Prob = (0.000009)

N = 10

INTERPRETATION OF RESULTS:

The intercept of Lin Log functional form is negative. If the value of independent variable X=0 then the value of dependent variable -153.2110 units and the slope coefficient is positive which states that if the independent variable increases by 1 unit the dependent variable will also increase by 54.95025

Formulation of null hypothesis:

H_0: b_1=0 (test statistic is not significant)

H_1: $b_1 \neq 0$ (test statistic is significant)

For intercept:

From the above example we can say that the value of test statistic is -6.801467 and the related prob value is 0.0001 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

For slope:

From the above example we can say that the value of test statistic is 9.925978 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

Formulation of hypothesis for r^2

H_0: r^2 =0 which means test statistic is not significant

H_1: $r^2 \neq 0$ which means test statistic is significant

In this case that the value of F statistic is 98.52504 and the related prob value is 0.000009 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant and independent variable explains the variation in the dependent variable significantly.

RECIPROCAL MODEL

Models of the following type are known as reciprocal model: $y=B_1+B_2(1/X)+U$. This model is non-linear in X because it enters the model inversely or reciprocally but it is a linear regression model because the parameters are linear.

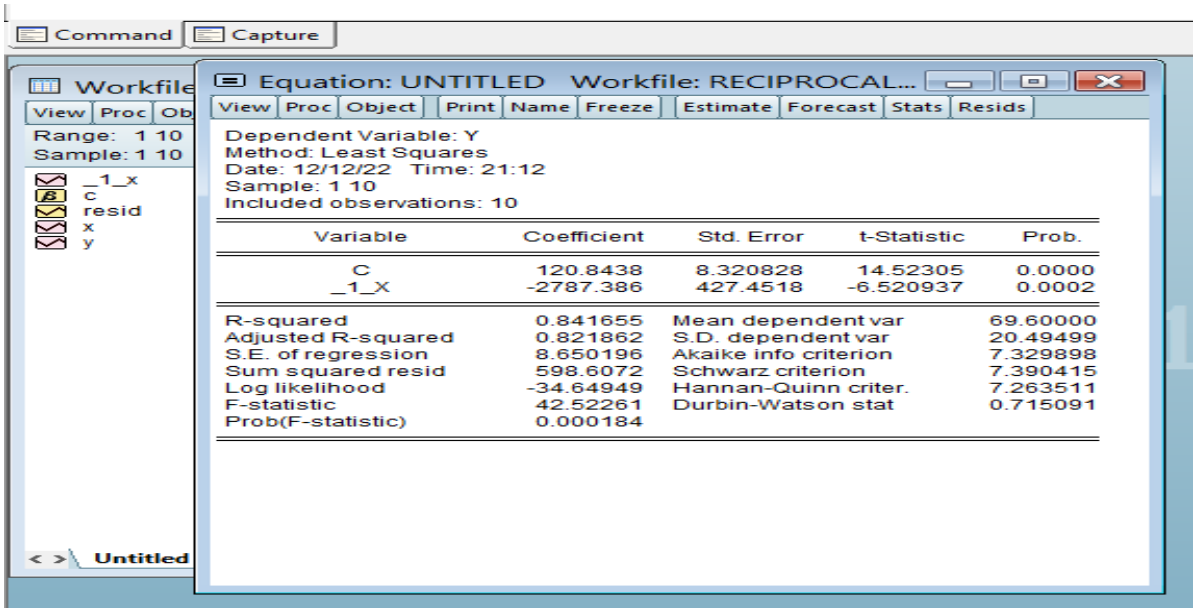
Steps for estimating reciprocal model:

Create an excel sheet with data series of x ,y, 1/x and import the excel sheet to EViews →Click on Quick, then estimate equation then type first the dependent variable (y) and then c and then independent variable (1/x) and click 'OK', the desired results will appear.

TABLE

X	Y	1/x
32	45	0.03125
38	48	0.026316
45	50	0.022222
48	56	0.020833
55	68	0.018182
64	69	0.015625
72	74	0.013889
78	88	0.012821
80	94	0.0125
98	104	0.010204

RESULT:



REPORTING OF RESULTS:

Reporting the regression equation means systematically arranging the values obtained after estimating the regression equation.

Y = 120.8438 - 2787.386(1/X)

S.E = (8.320828) (427.4518)

T statistic = (14.52305) (-6.520937)

Prob = (0.000) (0.0002)

r^2 = (0.841655)

Adjusted r^2= (0.821862)

F-statistic = (42.52261)

Prob = (0.000184)

N = 10

INTERPRETATION OF RESULTS:

The intercept of reciprocal functional form is positive. If the value of independent variable X=0 then the value of dependent variable 120.8438 units and the slope coefficient is negative which states that if the independent variable increases by 1 unit the dependent variable will decrease by 2787.3861.

Formulation of null hypothesis:

H_0: b_1=0 (test statistic is not significant)

H_1: $b_1 \neq 0$ (test statistic is significant)

For intercept:

From the above example we can say that the value of test statistic is 14.52305 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

For slope:

From the above example we can say that the value of test statistic is -6.520937 and the related prob value is 0.0002 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

Formulation of hypothesis for r^2

H_0: $r^2 = 0$ which means test statistic is not significant

H_1: $r^2 \neq 0$ which means test statistic is significant

In this case that the value of F statistic is 42.52261 and the related prob value is 0.000184 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant and independent variable explains the variation in the dependent variable significantly.

LOG RECIPROCAL MODEL

Models of the following type are known as reciprocal model: $Lny = B_1 + B_2 (1/X) + U$.

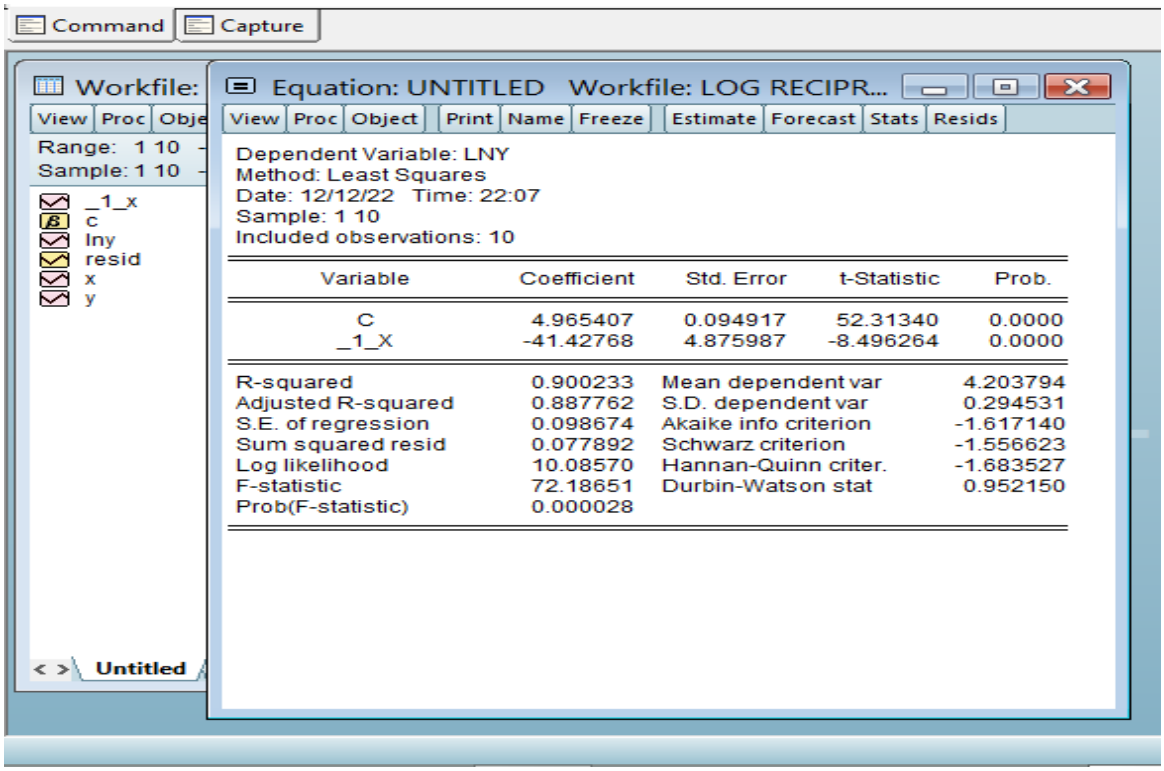
Steps for estimating reciprocal model:

Create an excel sheet with data series of x , lny, 1/x and import the excel sheet to EViews →Click on Quick, then estimate equation then type first the dependent variable (lny) and then c and then independent variable (1/x) and click 'OK', the desired results will appear.

TABLE

X	Y	lny	1/x
32	45	3.806662	0.03125
38	48	3.871201	0.026316
45	50	3.912023	0.022222
48	56	4.025352	0.020833
55	68	4.219508	0.018182
64	69	4.234107	0.015625
72	74	4.304065	0.013889
78	88	4.477337	0.012821
80	94	4.543295	0.0125
98	104	4.644391	0.010204

RESULT:



REPORTING OF RESULTS:

Reporting the regression equation means systematically arranging the values obtained after estimating the regression equation.

lnY = 4.965407 - 41.42768(1/X)

S.E = (0.094917) (4.875987)

T statistic = (52.31340) (-8.496264)

Prob = (0.000) (0.000)

r^2 = (0.900233)

Adjusted r^2= (0.887762)

F-statistic = (72.18651)

Prob = (0.000028)

N = 10

INTERPRETATION OF RESULTS:

The intercept of log reciprocal functional form is positive. If the value of independent variable X=0 then the value of dependent variable 4.965407 units and the slope coefficient is negative which states that if the independent variable increases by 1 unit the dependent variable will decrease by -41.42768

Formulation of null hypothesis:

H_0: b_1=0 (test statistic is not significant)

H_1: b_1≠0 (test statistic is significant)

For intercept:

From the above example we can say that the value of test statistic is 52.31340 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

For slope:

From the above example we can say that the value of test statistic is -8.496264 and the related prob value is 0.000 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

Formulation of hypothesis for r^2

H_0: r^2 =0 which means test statistic is not significant

H_1: r^2≠0 which means test statistic is significant

In this case that the value of F statistic is 72.18651 and the related prob value is 0.000028 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant and independent variable explains the variation in the dependent variable significantly.

UNIT 5

MULTIPLE REGRESSION MODEL

Estimation of parameter:

Parameter Estimation is a branch of statistics that involves using sample data to estimate the parameters of a distribution.

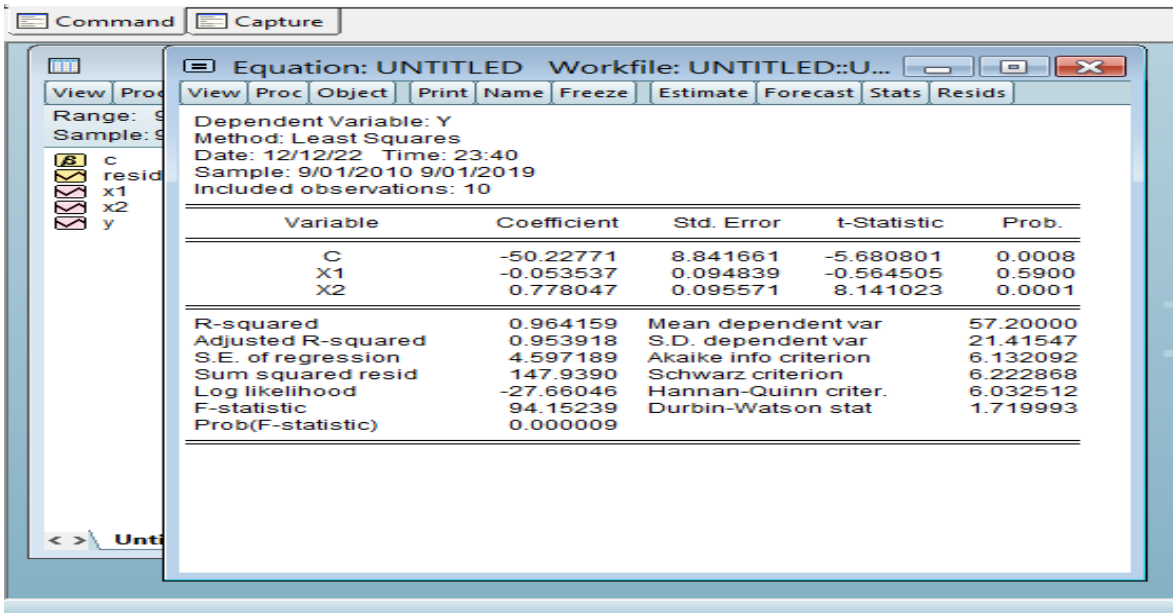
Steps for estimating multiple regression model:

Create an excel sheet with data series of y x1, x2 and import the excel sheet to EViews →Click on Quick, then estimate equation then type first the dependent variable (Y) and then c and then independent variables x1 space x2 and click 'OK', the desired results will appear.

TABLE:

y	x1	x2
24	124	110
32	126	115
45	138	120
48	145	136
52	196	148
57	145	152
68	187	164
72	192	173
84	174	186
90	190	188

RESULTS:



REPORTING OF RESULTS:

Reporting the regression equation means systematically arranging the values obtained after estimating the regression equation.

Y = -50.22771 - 0.053537X_1 + 0.778047X_2

S.E = (8.841661) (0.094839) (0.095571)

T statistic = (-5.680801) (-0.564505) (8.141023)

Prob = (0.0008) (0.5900) (0.0001)

r^2 = (0.964159)

Adjusted r^2= (0.953918)

F-statistic = (94.15239)

Prob = (0.000009)

N = 10

INTERPRETATION OF RESULTS:

The intercept of multiple regression model is negative. If the value of independent variables $X_1$and X_2 is 0 then the value of dependent variable will be -50.22771 units and the slope coefficient of X_1 is negative which states that if the independent variable increases by 1 unit the dependent variable will decrease by -0.053537 and the slope coefficient of X_2 is positive which states that if the independent variable increases by 1 unit the dependent variable will also increase by 0.778047.

Formulation of null hypothesis:

H_0: b_1=0 (test statistic is not significant)

H_1: b_1≠0 (test statistic is significant)

For intercept:

From the above example we can say that the value of test statistic is -5.680801 and the related prob value is 0.0008 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

For slope:

From the above example we can say that the value of test statistic of X_1 is -0.564505 and the related prob value is 0.5900 which is greater than 5% so we accept our null hypothesis and reject our alternate hypothesis which means the test statistic is not significant.

From the above example we can say that the value of test statistic of X_2 is 8.141023 and the related prob value is 0.0001 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant.

Formulation of hypothesis for r^2

H_0: r^2 =0 which means test statistic is not significant

H_1: $r^2 \neq 0$ which means test statistic is significant

In this case that the value of F statistic is 94.15239 and the related prob value is 0.000009 which is less than 5% so we reject our null hypothesis and accept our alternate hypothesis which means the test statistic is significant and independent variables explains the variation in the dependent variable significantly.