Quantitative Method
Assignment2
2024/11/12
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3.21

a.

I open CAPM5 in EViews, select Quick to do Estimate equation and then execute (xom - riskfree) c (mkt - riskfree) The data obtained are as follows

ExxonMobil: bk = 0.456521 t 0.25(178) = 1.962 se(bk) = 0.071550
Microsoft: bk = 1.201840 t 0.25(178) = 1.962 se(bk) = 0.122152

ExxonMobil tc * se(bk) = 1.962*0.071550 = 0.1403811
P[0.456521-0.1403811 , 0.456521+0.1403811] = [0.316, 0.597]

Microsoft: tc * se(bk) = 1.962*0.122152 = 0.239662
P[1.201840-0.239662, 1.201840+0.239662] = [0.962 , 1.441]

b.

Estimating the CAPM model: In EViews, perform regression analysis on Ford, General Electric, and Exxon-Mobil: (t=(beta-1)/Standard Error)

(FORD - RISKFREE) C (MKT - RISKFREE)
beta=1.662031 SE=0.206937 t=(1.662031-1)/0.206937)=3.1992

(GE - RISKFREE) C (MKT - RISKFREE)
beta=1.147952 SE=0.089539 t=(1.147952-1)/0.089539)=1.6524

(XOM - RISKFREE) C (MKT - RISKFREE)
beta=0.456521 SE=0.071550 t=(0.456521-1)/0.071550)=-7.5958

2. The rejection area at the 5% significance level is: |t| > 1.96
so Ford and XOM are significant, reject Ho, and GE is not rejected.

c.

As Ho: beta >= 1; Ha: beta <1;
Already know that (Exxon-Mobil) t-statistic=-7.595777, df=178, p-value=0.0000;
This is a singal test at the 5% significance level, I use command:[scalar a=@qtdist (0.05,178)] find out the t critical value=-1.653459
Because -7.595777 < -1.653459 , so Reject the Ho.
and because p-value is lower than 0.05 so reject the Ho

d.

Microsoft Ho: beta<=1; Ha: beta>1
scalar t_critical = @qtdist(0.95, 178) got value=1.6534591
t-statistic=1.652371 df=178 p-value=0.1002 (這是雙尾)
scalar p_value = (1 - @ctdist(1.652371, 178))
p_value=0.05011089316418626
Because t-statistic<t_critical and p_value=0.05011 > 0.05 so fail to reject.

e.

Ho: c(1)=0; Ha≠0;
(Ford-C(1)=0) t-statistic=0.369564, p-value=0.7121;
t-critical(0.975, 178)=1.973380888548833
0.369564 < 1.973380888548833 Fail to reject
(GE) t-statistic=-0.216678 p-value=0.8287
(ExxonMobil)t-statistic=1.494428 p-value=0.1368

Answer: The 3 companies all fail to reject the null hypothesis.

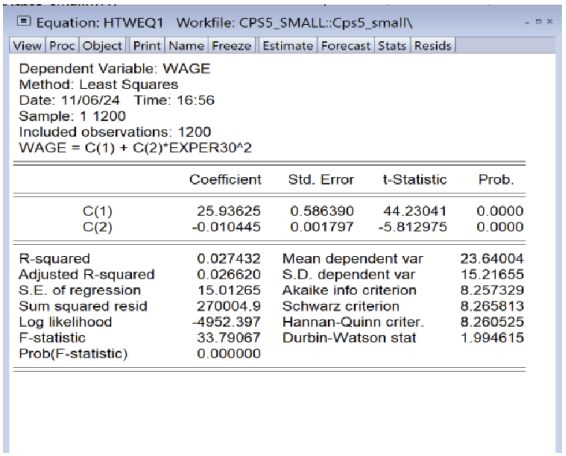
3.27

a.

(1)EViews->Window->1 Command [**series exper30=exper-30**] to create an object 'exper30'.
(2)right click 'exper30'->Open->
View->Statistics By Classification->
Series/Group for classify
[**exper30>0 | exper30=0 | exper30<0**]

b.

1. *Command Window ->[* ***equation htweq1.ls wage = c(1) + c(2)*exper30^2*** *] then get the new Object*
2. *then perform a t-test, CommandWindow->[htweq1.test(c(2)=0)]*



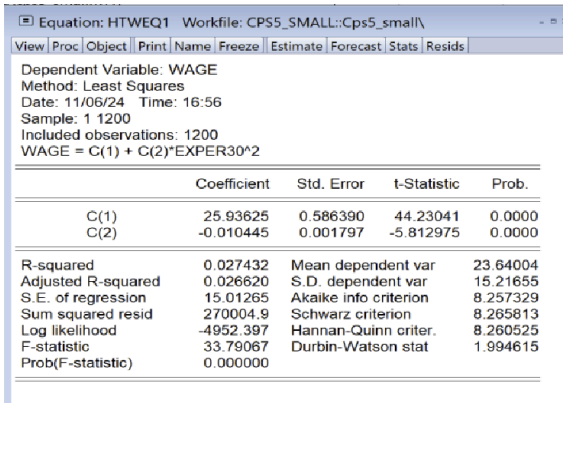
Equation: HTWEQ1 Workfile: CPS5_SMALL::Cps5_small\

View | Proc | Object | Print | Name | Freeze | Estimate | Forecast | Stats | Resids

Dependent Variable: WAGE
Method: Least Squares
Date: 11/06/24 Time: 16:56
Sample: 1 1200
Included observations: 1200
WAGE = C(1) + C(2)*EXPER30^2

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	25.93625	0.586390	44.23041	0.0000
C(2)	-0.010445	0.001797	-5.812975	0.0000

R-squared	0.027432	Mean dependent var	23.64004
Adjusted R-squared	0.026620	S.D. dependent var	15.21655
S.E. of regression	15.01265	Akaike info criterion	8.257329
Sum squared resid	270004.9	Schwarz criterion	8.265813
Log likelihood	-4952.397	Hannan-Quinn criter.	8.260525
F-statistic	33.79067	Durbin-Watson stat	1.994615
Prob(F-statistic)	0.000000		



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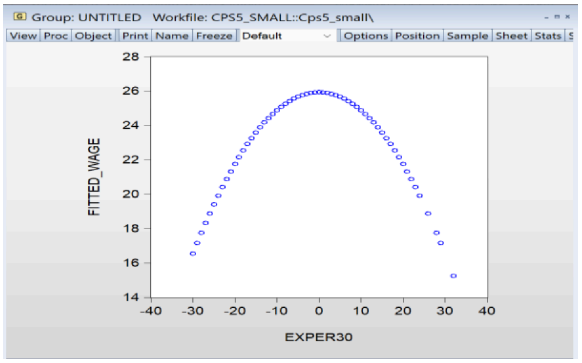
As Prob.=0.000, so that p-value is less than significance level (0.01), null hypothesis that γ2 = 0 is been reject, we may conclude that there is a statistically significant quadratic relationship between wages and experience.

c.



d.

WindowCommand:[***scalar b2 = HTWEQ1.@coefs(2) ' Coefficient for EXPER30^2***]
Then:
scalar slope_at_0 = 2 * b2 * (-30)
scalar slope_at_10 = 2 * b2 * (-20)
scalar slope_at_20 = 2 * b2 * (-10)
then Display the Results:
slope_at_0 = 0.626725
slope_at_10 = 0.417817
slope_at_20 = 0.206908

e.

WindowCommand:
scalar gamma2 = HTWEQ1.@coefs(2) ' Assuming @coefs(1) is the intercept and @coefs(2) is for EXPER30^2
get the: **gamma2= -0.010445**
then:
scalar se_gamma2 = HTWEQ1.@se(2) ' Standard error for gamma2
then get the: **SE_GAMMA2=15.01265276524254**

then:
scalar t_stat_at_0 = slope_at_0 / se_gamma2
and so on to
get: **t_stat_at_0 =0.04174645949197348**
and: **t_stat_at_10 =0.02783097299464898**
and: **t_stat_at_20 =0.2089083668437538**