

EE325 Practice (Heteroscedasticity and Autocorrelation)

11.1 (a) *False*. The estimators are unbiased but are inefficient.

(b) *True*.

(c) *False*. Typically, but not always, will the variance be overestimated.

(d) *False*. Besides heteroscedasticity, such a pattern may result from autocorrelation, model specification errors, etc.

(e) *True*.

(f) *True*.

(g) *False*. Heteroscedasticity is about the variance of the error term u_i and not about the variance of a regressor.

11.16

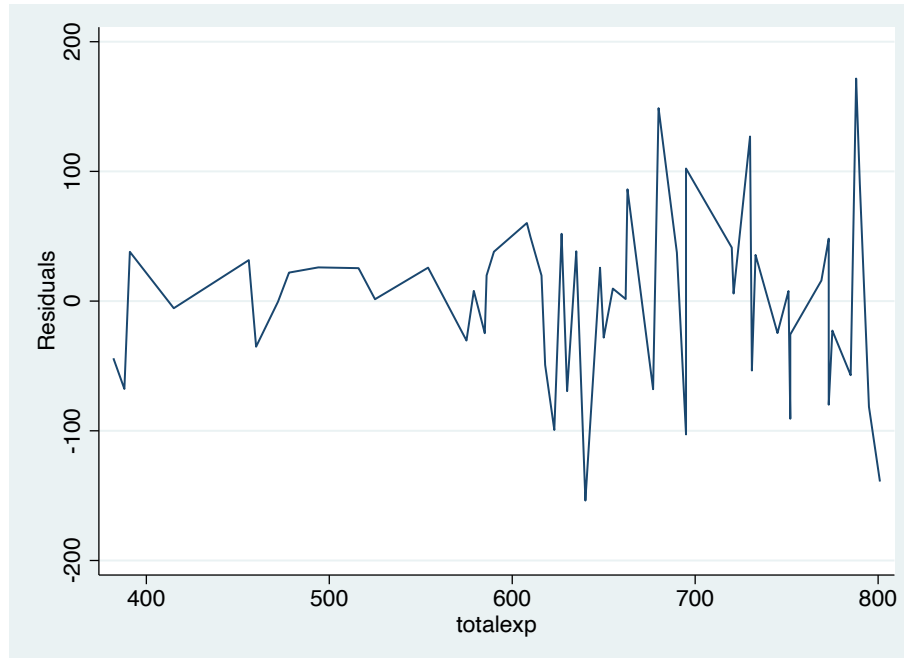
a.

Source	SS	df	MS	Number of obs	=	55
Model	139022.82	1	139022.82	F(1, 53)	=	31.10
Residual	236893.616	53	4469.69087	Prob > F	=	0.0000
				R-squared	=	0.3698
				Adj R-squared	=	0.3579
Total	375916.436	54	6961.41549	Root MSE	=	66.856

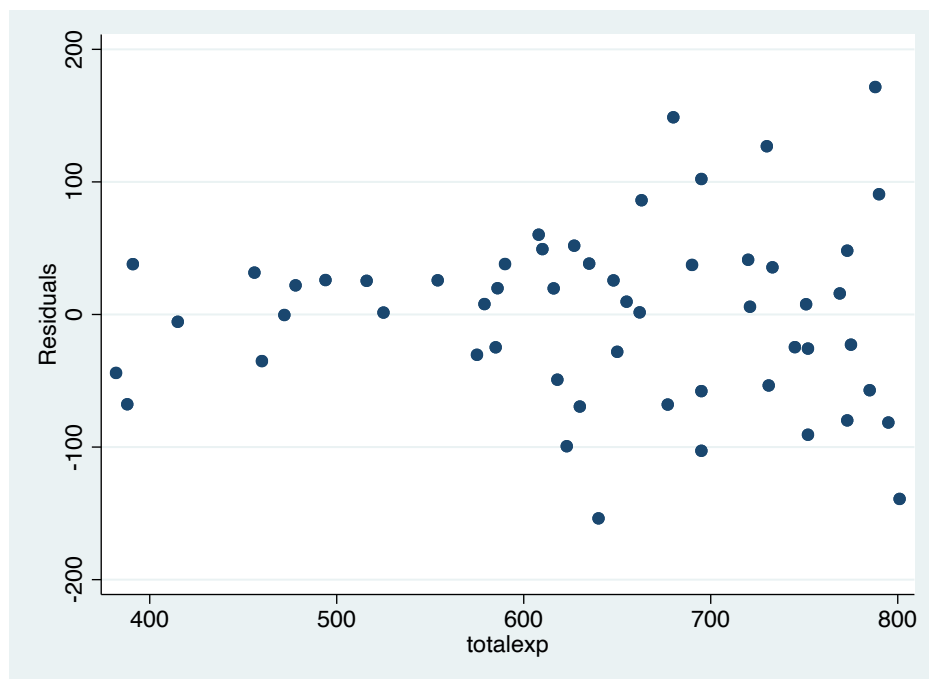
foodexp	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
totalexp	.4368088	.0783226	5.58	0.000	.2797135	.593904
_cons	94.20878	50.85635	1.85	0.070	-7.796134	196.2137

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b) The residuals obtained from this regression look as follows:



Plotting residuals (R1) against total expenditure, we observe



It seems that as total expenditure increases, the absolute value of the residuals also increase, perhaps nonlinearly.

c)

White's general test statistic : 7.374513 Chi-sq(2) P-value = .025

H_0 = Homoscedasticity

H_1 = Otherwise

White's general test statistic : 7.374513

Critical Chi-sq(2) = 5.9914 (5% significance level)

Reject H_0

There is enough evidence to say that there is heteroscedasticity

d) White's heteroscedasticity-consistent standard errors

Compared with the OLS regression results given in (a), there is not much difference in the standard error of the slope coefficient. although the standard error of the intercept has declined.

Linear regression	Number of obs	=	55
	F(1, 53)	=	34.60
	Prob > F	=	0.0000
	R-squared	=	0.3698
	Root MSE	=	66.856

foodexp	Robust					
	Coefficient	std. err.	t	P> t	[95% conf. interval]	
totalexp	.4368088	.0742544	5.88	0.000	.2878733	.5857442
_cons	94.20878	43.26305	2.18	0.034	7.434094	180.9835

12.26

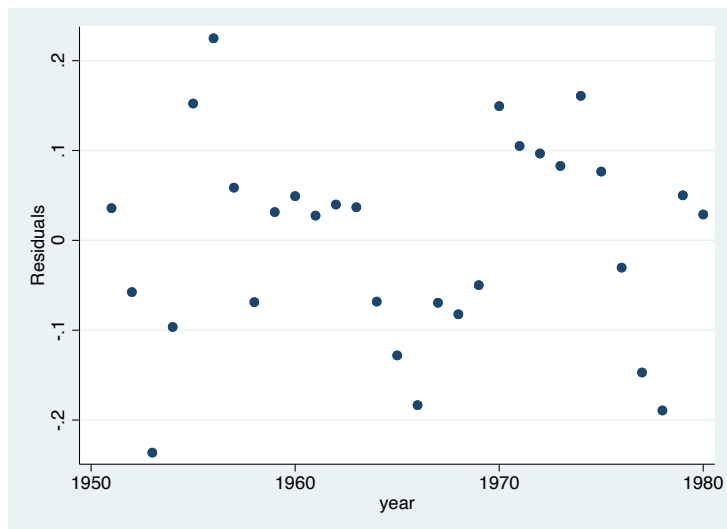
a)

Source	SS	df	MS	Number of obs	=	30
Model	5.42774163	4	1.35693541	F(4, 25)	=	91.54
Residual	.370572985	25	.014822919	Prob > F	=	0.0000
				R-squared	=	0.9361
				Adj R-squared	=	0.9259
Total	5.79831462	29	.199941883	Root MSE	=	.12175

lnc	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
lni	.4675086	.1659868	2.82	0.009	.1256524	.8093647
lnl	.2794423	.1147258	2.44	0.022	.0431602	.5157244
lnh	-.0051515	.142947	-0.04	0.972	-.2995564	.2892534
lna	.4414491	.1065083	4.14	0.000	.222091	.6608071
_cons	-1.500441	1.00302	-1.50	0.147	-3.5662	.5653184

Interpret the meaning (Hint: Double log regression.... Must use the correct unit of analysis to receive full credits)

b)



c)

H_0 = No positive autocorrelation

H_1 = Otherwise

H_0^* = No negative autocorrelation

H_1^* = Otherwise

Durbin–Watson d-statistic (5, 30) = .9549404

From Durbin–Watson table

dL=1.071

dU=1.833

4-dU=4-1.071

4-dL=4-1.833

Reject H_0 = No positive autocorrelation

There is enough evidence to say that there is positive first-order autocorrelation.