

Second Exam

Write all answers in your blue book and show all work there. Return your exam and printout(s) in your blue book.

35 pts.

1) Consider the data below. Do this work by hand and show your work.

Q	time
13	1
13	2
17	3
17	4
21	5

- a) Fit a regression line where Q is a function of time.
- b) Find the r^2 for your line and interpret it.
- c) Make a rough residual plot and find and describe any econometric problems that are suggested.
- d) Given that the s_{YX} is 1.26, construct a 95 percent confidence interval for μ_{YX} when time is 6.
- e) Would you be equally confident about your estimate of Q when time is 16? Explain.
- f) Given that s_b is .4, is your sample slope statistically significant? Let $\alpha = .05$ and show all steps to the test.
- g) Set up the normal equations for this model and use them to find the slope and intercept.

15 pts.

2) **Computer problem.**

a) Put the following data into a spreadsheet and fit a linear model to it. Be sure to ask for a scatter plot of either the original data or the residuals.

Y	X
10	100
8	120
6	140
8	160
10	170

- b) What do you see in your results that indicates the quality of your fit?
- c) Try another model that you think will give a better fit and describe any improvement that you see in your new results.

30 pts.

- 3) a) Open the Trucks file in the Chapter 15 folder. **Computer Problem**
- b) Set up a model where resale percentage is a function of price and 2 dummy variables, one for each type of vehicle by putting the appropriate columns in your spreadsheet. Write the equation in your bluebook with explicit codes for your dummy variables.
- c) Use the computer to get the estimates for your model. Be sure to ask for indicators of collinearity, outliers and influential observations.
- d) Which, if any, of the variables in your model are statistically significant ($\alpha = .05$)?
- e) Do you find evidence of collinearity, outliers or influential observations? Explain.
- f) Draw a well-labeled diagram showing the regression lines given by your model for the different truck types.
- g) What would happen if you put a dummy variable in the model for the third truck type? Why?

20 pts.

- 4) Consider the printout below.
- a) Confirm that the adjusted R square is .881 from the other figures in the printout. Why is it not much different from the R square itself.
- b) Interpret the Durbin Watson statistic (answer without using the table).
- c) Interpret the ANOVA results.
- d) Examine the scatter plot for econometric problems. Discuss the two that you see the most evidence for.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.949 ^a	.900	.881	453.83638	1.596

a. Predictors: (Constant), Accounts, AdvExp, Share, Poten

b. Dependent Variable: Sales

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	37260200	4	9315049.948	45.226	.000 ^a
	Residual	4119349	20	205967.457		
	Total	41379549	24			

a. Predictors: (Constant), Accounts, AdvExp, Share, Poten

b. Dependent Variable: Sales

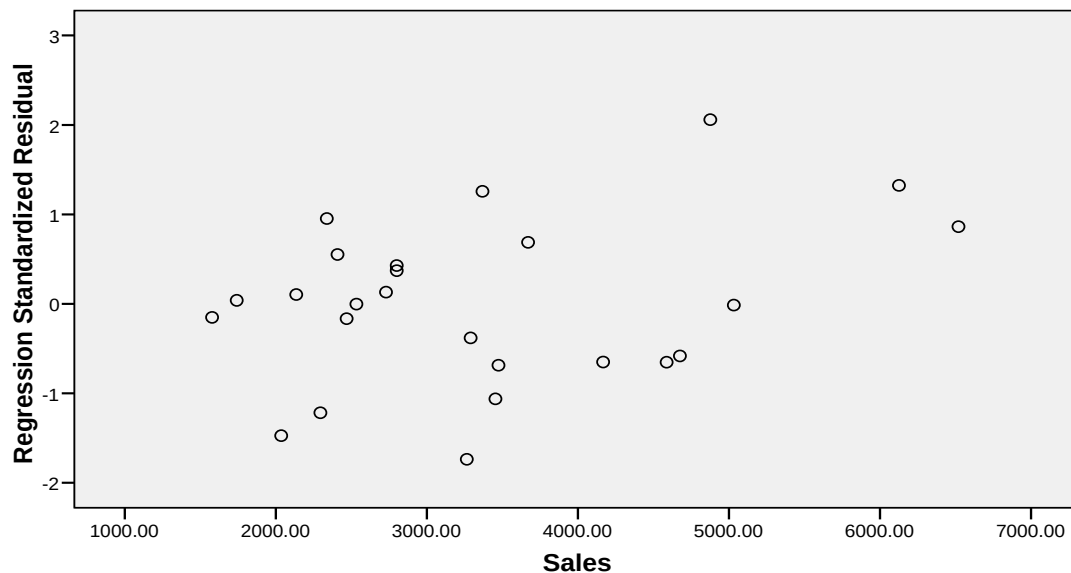
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1441.932	423.582		-3.404	.003
	Poten	.038	.008	.457	4.791	.000
	AdvExp	.175	.037	.358	4.741	.000
	Share	190.144	49.744	.356	3.822	.001
	Accounts	9.214	2.865	.320	3.216	.004

a. Dependent Variable: Sales

Scatterplot

Dependent Variable: Sales



I have neither given nor received unfair aid on this test nor am I aware of anyone else who has.