

Econ 120B
Spring 1998

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Second Midterm (30%)

Your name (please print it) _____

Your Student Id. (NOT Soc. Sec. no.) _____

DO NOT TURN THE PAGE UNTIL EVERYONE HAS RECEIVED THE EXAM AND YOU ARE GIVEN THE SIGNAL TO START. ALSO, YOU MUST STOP WRITING WHEN YOU ARE ASKED TO DO SO (YOU WILL BE GIVEN A 2 MINUTE WARNING). TEN POINTS WILL BE DEDUCTED FOR EACH MINUTE OF EXTRA TIME IT TAKES YOU TO STOP WRITING.

If you use a pencil, you forfeit the right to complain about grading UNLESS YOU PICK UP THE EXAM FROM THE TA FROM HIS/HER OFFICE AND LOOK AT THE GRADING BEFORE LEAVING THE OFFICE.

Make sure that all pages (1 through 5) are there. Read the questions carefully and make sure that you do not misunderstand them. If you get stuck somewhere, don't waste time but move on.

I CONSIDER CHEATING AS A VERY SERIOUS MATTER AND WILL GIVE AN F IN THE COURSE TO ANY ONE CHEATING AND ALSO REFER HIM/HER TO THE DEAN FOR DISCIPLINARY ACTION.

MAXIMUM NUMBER OF POINTS = 50

Using quarterly data for ten years (making the number of observations 40), the following model of demand for new cars was estimated.

$$\text{NUMCARS} = \beta_1 + \beta_2 \text{PRICE} + \beta_3 \text{INCOME} + \beta_4 \text{INTRATE} + \beta_5 \text{UNEMP} + u_t$$

where NUMCARS is the number of new car sales per thousand population, PRICE is the new car price index, INCOME is per capita real disposable income (in actual dollars), INTRATE is the interest rate, and UNEMP is the unemployment rate. The following table has the estimates of the β 's for three alternative models (constant term is not presented).

(Values in parentheses are standard errors)

Variable	Model A	Model B	Model C
constant	not shown	not shown	not shown
price	-0.071391 (0.034730)	-0.079392 (0.011022)	-0.024883 (0.007366)
income	0.003159 (0.001763)	0.00356 (0.0006266)	
intrate	-0.153699 (0.049190)	-0.146651 (0.039229)	-0.204769 (0.051442)
unemp	-0.072547 (0.298195)		
ESS	23.510464	23.550222	44.65914
ADJ RSQ	0.758	0.764	0.565
SGMASQ	0.671728	0.654173	1.207004
AIC	0.754701	0.719108	1.29716
FPE	0.755693	0.71959	1.297529
HQ	0.814563	0.764388	1.35795
SCHWARZ	0.932092	0.851414	1.472329
SHIBATA	0.734702	0.706507	1.28395
GCV	0.767689	0.726859	1.304869
RICE	0.783682	0.735944	1.313504

In Model A, test the joint hypothesis $\beta_3 = \beta_5 = 0$ by carrying out the following steps.

1. (8 points) Write down the formula for the test statistic and compute it.

2. (3 points) State its distribution and d.f.

3. (4 points) State the decision rule (for a 1 percent level) and your conclusion.

Next test each of the β 's in Model A only whether or not it is significantly different from zero by carrying out the following steps.

4. (3 points) Write down the d.f. for the test statistic. _____

5. (3 points) Write down the critical value (or range) for a 10 percent level of significance (don't ask me whether the test is one-tailed or two-tailed, you decide what it is based on the information given above).

6. (8 points) Use the information in 5 and test whether each coefficient (excluding constant) is significant or not. Clearly show your work and state your conclusion.

For PRICE

For INCOME

For INTRATE

For UNEMP

7. (4 + 4 points) Based on your test in 6, would you recommend any of the variables in Model A be omitted? If yes, which one and why? Also state what the advantages of omitting the variable(s) are.

8. (8 points) For each variable in Model A, explain whether the sign of the estimated regression coefficients is as you would expect or is it "the wrong sign"? (justify your answers carefully).

For PRICE

For INCOME

For INTRATE

For UNEMP

9. (5 points) Which of the three models is the "best". Explain what criteria you used and why you choose the model you did.