THE ARMAGEDDON
Economics 345–002
December 10, 2003
7:30-10:00 pm

NAME:_____

1. One of the main goals of modern microeconometrics is to determine the causal
    relationship between your y and x variables. Unfortunately, this is often hard to
    do because of omitted variables biases. Describe the two major econometric
    techniques we studied in class that are used to isolate causal relationships.
    Discuss how each of the techniques attempts to solve the omitted variables
    problem and the shortcomings of each technique. Use the rest of this page and its
    backside (if necessary) to write out your answer. (15 points)

2. In what situations should you use probit or logit models? Discuss the merits of these models relative to OLS regression in these situations. (5 points)

3. In what ways are controlled experiments a better tool for policy evaluation than econometric identification (e.g., through quasi-experiments)? What are some of the shortcomings of controlled experiments? (10 points)

4. Say you want to determine the effect of Drug X on Condition Y. How would you design an experiment to estimate the (causal) treatment effect of Drug X on condition Y, as well as any possible placebo effect? Explain why the elements of your experimental design are necessary. (10 points)

5. In a fixed effects model (i.e., one that includes both time fixed effects and subject fixed effects) of y, explain why you cannot isolate the effect of any X variable on Y if that X variable does not change for each subject during the time period measured in your dataset. (10 points)

6. What conditions must your instruments fulfill for IV analysis to isolate the causal effect of a set of X's on the outcome Y? How do you judge whether any given set of instruments meets these conditions? (10 points)

7. Explain why X variables that serve well for forecasting purposes might not necessarily be useful for determining the causal effect of the variable x on the outcome Y. Give some specific examples of instances where an x that is useful for forecasting might not be very enlightening if you are concerned about causality. (10 points)

8. State the hypothesis of one of the papers (written by me) that I assigned during the semester and explain how I set out to test that hypothesis. (5 points)

9. You are examining the effect of campaign spending on the share of the popular vote that an incumbent Congressional Representative receives in an election. Because campaign spending might be endogenous to candidate quality for a host of reasons, you use instrumental variables analysis to examine this issue and the instruments that you use are: 1) the cost of television advertising in the area the incumbent represents and 2) the percent of individuals in the incumbent's area who are satellite TV subscribers (and therefore do not see local television advertisements; only national advertisements). (25 points)

Your IV results are as follows:

Variable	Coefficient	Standard Error	t-statistic	P value
Republican	-0.020	0.005	4.000	
Incumbent's % of vote in previous Election	0.100	0.020	5.000	
Incumbent's Seniority	-0.125	0.099	1.263	
Challenger held elected office	-0.300			0.050
Incumbent Spending	0.090	0.025		0.000
Adjusted R-squared	0.650			
Overidentification Statistic	0.030			0.860

Your first stage regression results for "Incumbent Spending" are as follows:

Variable	Coefficient	Standard Error	t-statistic	P value
Republican	10,000.000	6,000.000	1.667	
Incumbent's % of vote in previous Election	-6,000.000	1,000.000	6.000	0.000
Incumbent's Seniority	25,000.000	6,250.000	4.000	0.000
Challenger held elected office	50,000.000	27,500.000	1.818	
Instrument 1	0.874	0.333		
Instrument 2	-12.757	7.000		
Adjusted R-Squared	0.850			
F statistic for instruments	7.500			0.000

9.1 What two conditions must your instruments satisfy for you to be confident in drawing a causal inference about the effect of campaign spending on incumbent vote share? Do the instruments used above fulfill these conditions? How do you know?

9.2 Is the variable "challenger held elected office" a statistically significant determinant of an incumbent's vote share? What is the smallest Type 1 error under which you can declare this variable's coefficient to be statistically significant?

9.3 Regarding the variable discussed in 9.2 above, is there an endogeneity story that can be told that might make you hesitant to draw a causal inference about the effect (on incumbent vote share) of facing a challenger who previously held elected office? What is it?

9.4 The IV technique studied in class (and used above) is referred to as two stage least squares. Why (intuitively) is it referred to by that name?