

SUNY-Stony Brook. Economics Department
Economics 323: Fall 2011
Professor Hugo Benítez-Silva

Practice Final Exam. The real thing will be December 20, 2011, from 2:15pm to 4:45pm, in our regular classroom.

Remember to show your work in every question you answer.

I *will not* distribute answers for these sample problems. The reason is that at least 2 questions from these ones, in total worth at least 25% of the total will be in the final. Feel free to ask clarification questions, including questions by e-mail or directly to the T.A. Notice the “*at least*”: in the past some exams have contained as much as 35% of previously distributed questions.

1. True or False. Credit will only be given for justified answers. (35 points, 10+10 +10+5)

a) Multiple Regression always provides a better fit than a Simple Regression Model **True or False**

b) An investor is always willing to pay a positive amount for the option to delay an investment project to observe the realization of an uncertain variable **True or False**

c) If a risk-neutral individual buys insurance for his home from a particular company we know her risk-averse neighbor will most definitely prefer to spend her money in something else **True or False**

d) From the fact that a particular investment project has a positive NPV we can infer that the IRR is larger than the interest rate. **True or False**

2.I expect you to nail this one. (15 points) Show your calculations.

Our friend **Surely Strong Penny** tells me her utility function is $U(c_1, c_2) = \min \{c_1, c_2\}$ where c_1 and c_2 are her consumption in period 1 and 2 respectively. I know in the first period she earns \$225 thousand and \$216 thousand in period 2. She can borrow or lend at an interest rate of 20%. Inflation is negligible. What will she do?

- a) Borrow 4 thousand dollars
- b) She will neither borrow nor lend.
- c) She will save 4 thousand dollars
- d) Give 4.5 thousand to charity.
- e) None of the above.

3. As you know by now I have a young child. His name is Albert. We took him to the pediatrician a few weeks after he was born for his 2 month well-baby check-up. In this type of visit they weigh him, they measure his length and they measure the head circumference. His weight was 12 pounds and 11 ounces. His length was 22 inches and a half, and his head circumference was 34 centimeters. On the first two measures he was right at the median. However, on the head circumference measure he was only in the 25th percentile. But to my wife's surprise he said that such a head circumference was right at the average of the population of baby boys his age. I explain to my wife how to reconcile these two pieces of information. What is the explanation for this apparently puzzling statement? (Hint: Please be as precise as possible, use the concepts we used in class to describe distributions, and use graphs if necessary) **(15 points)**

4. Insurance Companies, Risks, Prices and Regressions (35 points)

Insurance companies make a living trying to correctly assess the probability of particular events, and also the probability of certain individuals incurring in given types of accidents. Imagine for a second that we have access (legally of course) to data on individuals that have insured their cars in New York State. The insurance company (Let's call it Patakazo Inc.) gives us a set of demographic and socio-economic variables, among them the probability that each of those drivers will incur in an accident in the next year.

a) If the average probability of an accident of those insured with Patakazo is 7%, and the average value of the cars insured by the same company is \$23,000, what is the average premium paid by New Yorkers insured with Patakazo if we assume the insurance company makes zero economic profits.

b) Can you write an econometric model that tries to explain using a set of variables the accident probabilities provided by the insurance company? Suggest a methodology to estimate the model.

c) Spell out which variables do you think belong in your econometric model and what do you think would be the sign of their coefficients if we were to use regression analysis to estimate the model. What would the interpretation be of those coefficients?

d) If I told you that a regression that tries to explain the variation in accident probabilities just with indicators of the individuals' gender (male equal to 1, female equal to zero) delivers a Residual Sum of Squares of about 88% of the Total Sum of Squares, could you tell me a rough estimate of the R-squared and explain its meaning?

e) If to the conjectured regression introduced in d) I add a measure of whether the person wears a seat-belt when driving, would you expect the coefficient on gender to increase or decrease? (assume the coefficient on gender in the simple regression was positive) Why? How is this related to the concept of Omitted Variable Bias?