Professor Joyce Jacobsen

Economics 300
Summer 2010

Assignment #7

Due Tuesday 6/22/10 by 6 p.m. in the Econ 300/QAC201 slot in the Economics Alcove

Please show the calculations used to arrive at your answers. Round final answers to the second decimal place if necessary.

A. Use of DataInsight data and Excel to study U.S. real per capita output growth. Provide a printout of your calculations (e.g., print your worksheet) as part of the write-up for this problem.

1) Get the three variables real GDP, real GNP (both of which are measured in billions of chained 2005 dollars), and U.S. population (measured in thousands of persons), from the DataInsight database into an Excel worksheet.* GDP and GNP are quarterly series starting in 1947; population is annual, stating in 1948 and ending in 2009. Make sure the data are lined up correctly and are expressed in annual terms. Then calculate the annual growth rates of real GDP per capita and real GNP per capita (in either percentage or proportional terms). Note: If you don't know what any of these terms mean, including real, GDP, GNP, and per capita, look them up.**

2) Calculate the means and standard deviations of the annual growth rates of real GDP per capita and real GNP per capita. Then calculate (with a calculator or better yet, in your Excel worksheet) a 95% confidence interval for the difference in the annual growth rates of GDP and GNP. Does it matter which of these two series is used to measure real per capita output growth for the U.S.? If it does matter, which measure would you prefer to use, and why?

3) Pick one of the two series (perhaps the one you preferred in **2**) and divide the series at the year in which you were born. Calculate the means and standard deviations of the series for the two time periods separately. Then construct a 95% confidence interval for the difference in the mean growth rates before and after your birthdate. Is this evidence supportive of the hypothesis that your birth caused a difference in U.S. output growth?

4) When using time-series data on GNP, GDP, and population, there is only one value for each series in existence in the historical record for each point in time. What does a confidence interval mean in these cases? What is the underlying population that one is drawing a sample from?

B. A real estate agency wants to estimate the average selling price of houses in Middletown. It randomly samples 25 recent sales and calculates the average price $\overline{X}$ = \$192,000 and the standard deviation s = \$15,000. Calculate a 95% confidence interval for the mean of all recent selling prices.

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* For population, Manolis suggests using the table browser and select\United states(detail)>demographics>Annual Population estimates table and then extract "both sexes, all ages" for the civilian version of the table.

** Note also that the first part of this exercise is to learn how to manipulate data before you even get to the statistical calculation, so this data handling is not beside the point, it is the point.

C. Some states have minimum wage laws that specify a rate higher than the federal minimum; in other words, binding price floors. A random sample of 5 states with binding minimum wage laws and 5 states without showed the following unemployment rate in August 2009 for each state:

States without minimum wage laws	States with minimum wage laws
4.3%	7.5%
6.8%	8.1%
10.7%	9.2%
8.6%	8.6%
8.9%	10.8%

A commentator claims that minimum wages cause higher unemployment rates. Do these data support this claim? How might you suggest the claim be modified?

D. Suppose we observed five states that implemented a binding minimum wage. We could measure the unemployment rate in each state a year before and a year after the law is passed:

State	before law is passed	after law is passed
a	4.3%	7.5%
b	6.8%	8.1%
c	10.7%	9.2%
d	8.6%	8.6%
e	8.9%	10.8%

A commentator claims that minimum wages cause higher unemployment rates. Do these data support this claim? How might you suggest the claim be modified?

E. According to ABC, for June 3-6, 2010, 52 percent of adults nationwide had a favorable opinion of President Obama (from a sample of 1004). According to CBS, for May 20-24, 2010, 47 percent of adults nationwide had a favorable opinion of President Obama (from a sample of 1054). [http://www.pollingreport.com/obama_job.htm].

1) What is the 95% confidence interval for Obama's approval rating for ABC? For CBS?

2) What is the 95% confidence interval for the difference?