

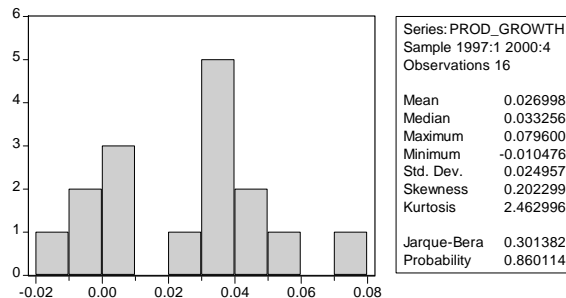
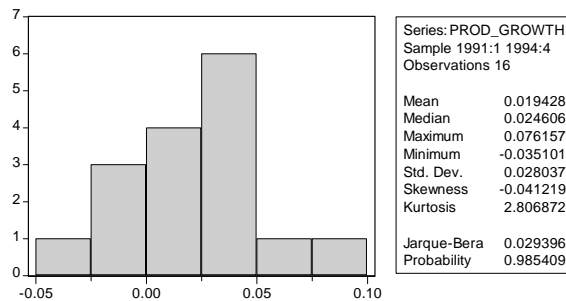
Problem Set 4

This problem set is due in lecture on **Monday, April 19th**. No late problem sets will be accepted. **Be sure to show your work** (that is, do not use a spreadsheet or statistical program to generate your answers), and to write your name, ID number, as well as the name of your Teaching Assistant, on your problem set. Numbered problems refer to the textbook problems.

- 8.22
- 8.32
- **Z.1** A random sample of $n=4$ observations from a normally distributed population produced the following data: 9.4, 12.2, 10.7, 11.6. Do the data provide sufficient evidence to indicate that $\mu > 10$?
 - a. State H_a .
 - b. State H_0 .
 - c. Give the rejection region for the test for $\alpha=0.10$.
 - d. Conduct the test and state your conclusions.
- 8.54
- **Z.2** A random sample of $n=2000$ observations from a binomial population produced $x=1238$.
 - a. If your research hypothesis is that p is greater than 0.6, what should you choose for your alternative hypothesis? Your null hypothesis?
 - b. Does your alternative hypothesis in part (a) imply a one- or two-tailed statistical test? Explain.
 - c. Do the data provide sufficient evidence to indicate that p is greater than 0.6? Test using $\alpha=0.05$.
- 8.72
- 8.80
- **Z.3** Independent random samples of $n_1=80$ and $n_2=80$ were selected from populations 1 and 2, respectively. The population parameters and the sample means and variances are shown in the accompanying table.

Params. & Stats.	<u>Population</u>	
	1	2
Pop. Mean	μ_1	μ_2
Pop. Var.	σ_1^2	σ_2^2
Sample size	80	80
Sample mean	11.6	9.7
Sample Var.	27.9	38.4

- If your research objective is to show that μ_1 is larger than μ_2 , state the alternative and the null hypotheses that you would choose for a statistical test.
 - Is the test in part (a) a one- or two-tailed test?
 - Give the test statistic that you would use for the test in parts (a) and (b), and the rejection region for $\alpha = 0.10$.
 - Look at the data. From your intuition, do you think the data provide sufficient evidence to indicate that μ_1 is larger than μ_2 ?
 - Conduct the test and draw your conclusion. Do the data present sufficient evidence to indicate that $\mu_1 > \mu_2$?
- 9.4. To use the t-statistic to test for a difference between the means of two populations, what assumptions must be made about the two populations? About the two samples?
 - 9.10
 - 9.24
 - 9.26
 - 9.56
 - 9.88
 - 9.70
 - Z.4 Consider the following data regarding nonfarm productivity growth for 1991q1-1993q4, and 1997q1-2000q4:



Conduct a test that the productivity growth rate was higher in the later period than the earlier period using the 10% significance level. You may assume that the population variances are the same.