

Homework 2

1. Use Stata or gretl to find each of the probabilities in exercises 2.10, 2.11, and 2.12 in Stock and Watson, 2e. Note, in 2.11 (c) Stock and Watson dropped a digit from the problem. Find $\Pr(Y > 1.831)$.

In Stata, the relevant functions for finding tail probabilities are:

- **normal(stat)**
- **chi2tail(df,stat)**
- **ttail(df,stat)**
- **Ftail(df_n, df_d, ,stat)**

type **help density functions** to get to Stata's online help. For the $F(n,\infty)$ distribution use a "large" number for infinity. Large would be something like $1e10$. Stata recognizes the use of scientific notation.

In gretl, the relevant commands are pvalue

- **pvalue z stat**
- **pvalue t df stat**
- **pvalue X df stat**
- **pvalue F df_n df_d stat**

Type **help pvalue** at the console to get to the online help. gretl also recognizes $1e10$ as a valid number in the degrees of freedom field.

2. Generate two samples of random numbers from the normal distribution, $X \sim N(4,6)$. The samples should have 15 observations each. Find the summary statistics of the two samples. Why are the means and standard deviations different in the two samples?

Generate another sample of size 200 from the $N(4,6)$ distribution and compute its summary statistics. Is the mean getting closer to what you would expect? Plot the histograms, overlaying a normal density curve on the top. Is this what you would expect the histogram to look like relative to the normal density?

Stata hints: Check out **help drawnorm**. From the pull-down menu go to **Statistics>Other>Draw a sample from a normal distribution**. Another method is to use **gen n1 = invnormal(uniform())** generates a $N(0,1)$. Multiply this by the standard deviation and add the mean to get the desired normal deviate. So, for example, $N(2,7)$: **gen n1 = sqrt(7)*invnormal(uniform()) + 2**

Gretl hints: Start a new dataset with the desired number of observations **File>New data set**. Then **Add>Random variable>normal** and fill in the desired mean and variance.