Economics 310
Fall 2004
University of Wisconsin-Madison

Menzie D. Chinn
Social Sciences 7418

Handout for Lecture of 13 October
Using the Normal Distribution (Oil Prices)

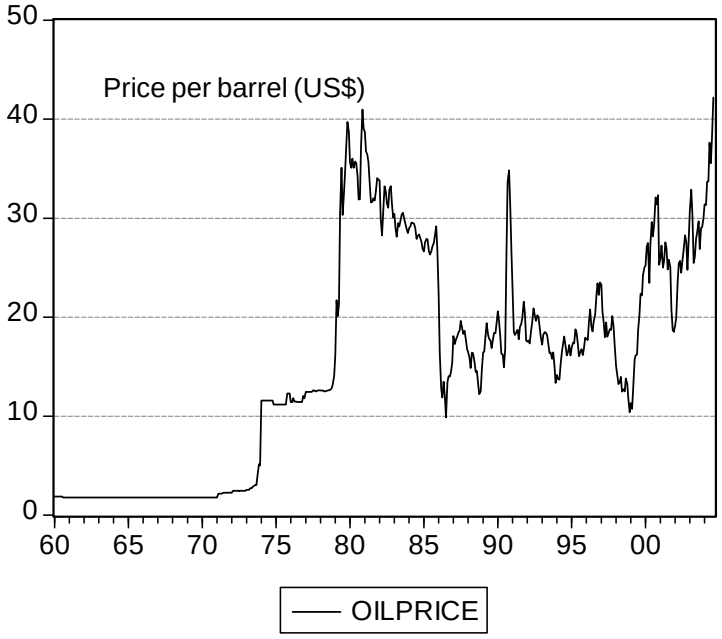

Figure 1: Nominal price of petroleum (US$/barrel). Source: IMF, *IFS* (10/11/04).

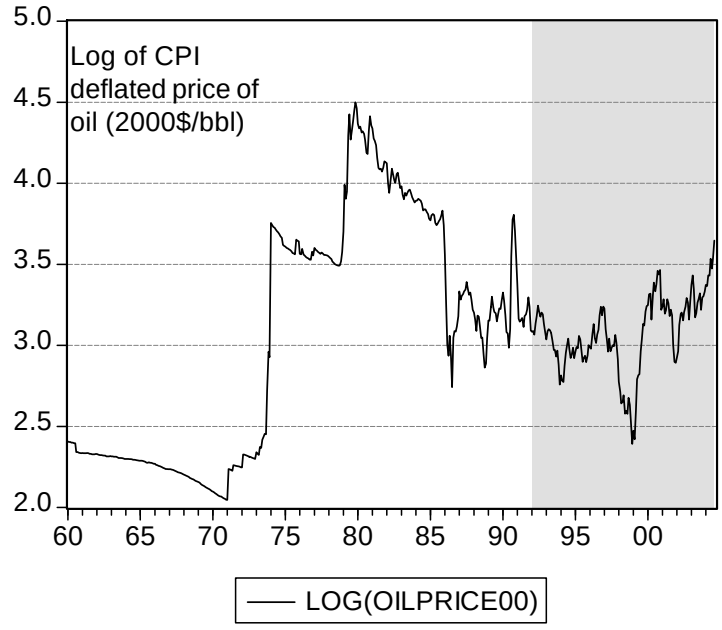

Figure 2: Log of real price of petroleum (2000$/barrel). Source: IMF, *IFS* (10/11/04), and author's calculations.

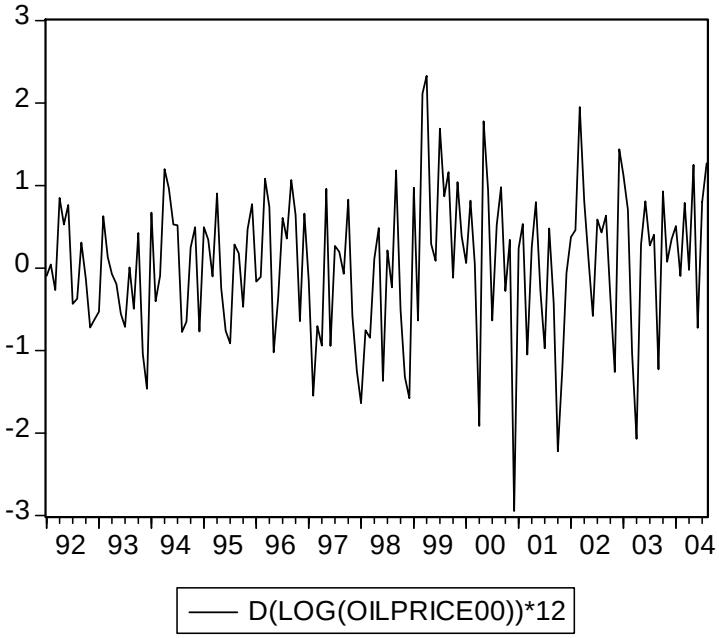

Figure 3: Annualized month-to-month percent change in the real price of oil, Jan. 1992-Aug. 2004 (percent in decimal form, i.e., 15%=0.15).

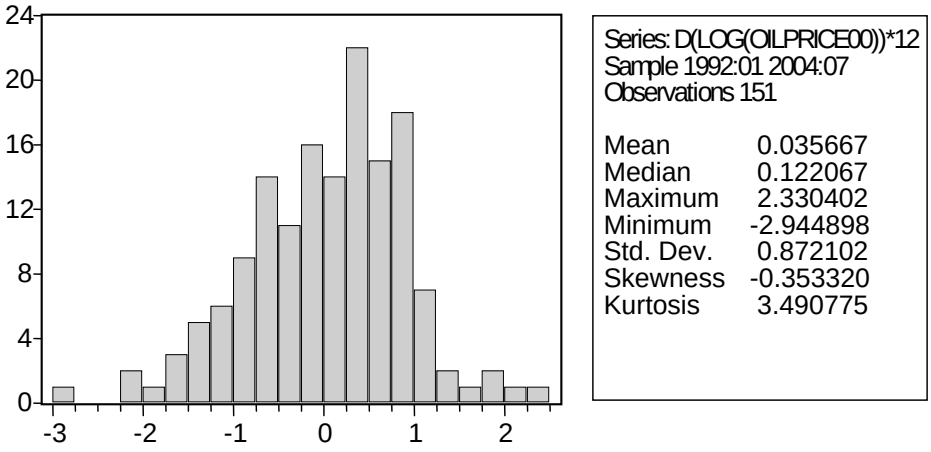

Figure 4: Histogram of annualized month-to-month percent change in the real price of oil (percent in decimal form).

In August 2004, the real price of oil rose 127% (i.e., D(LOG(OILPRICE00))*12 = 1.27). Find the probability that such a change, or greater, occurs.

This means one wants $P(x > 1.27)$. Calculate the z-score.

$$z - \frac{x - \mu}{\sigma} = \frac{1.271 - 0.036}{0.872} \approx 1.42$$

Hence, we want $P(z > 1.42)$

The entry in the Normal table corresponding to 1.42 is 0.4222. This means $P(z > 1.42) = 0.0778$. In other words, this event is not a particularly unusual event, although changes of such magnitudes occur with less than 10% probability.