Homework 9. Due Wednesday November 8th.

1. Prove that, for a standard normal, the integral

$$E\{\frac{z}{a+z}\} = \int_{-\infty}^{\infty} \frac{z}{a+z}\phi(z)dz\,,$$

does not exist. (Hint: integrate over an area around $-a$. Put an upper limit on the denominator define $x = z - a$ and show that the integral of $1/x$ does not converge at 0.)

Motivation: This shows up as the expectation of the IV-estimator in a very simple case. (See my handout.) This implies that the simplest IV-estimator can produce total garbage once in a while.

2. a) Use the updated Matlab panel data program posted and run it without fixed effects, but with clustered standard errors, clustered by state, and report the t-statistics calculated from the program. (Note, that you are not to use any of the built-in Matlab commands for this.)

b) Simplify the code to calculate White standard errors, then run the program, report the t-statistics and compare to a) .

c) Include state fixed effects and repeat questions a) and b).

d) Now assume that the errors are clustered by time (year), rather than by state. Modify the program and run it again. Report the t-statistics. Do this with or without time fixed effects.