Homework 2

Econ 6243

February 22, 2010

Consider a supply model for edible chicken (USDA calls them *broilers*). The data for this exercise are in the newbroiler.dta and come from data provided by Epple and McCallum (2006). The data are annual, 1950-2001.

$$\ln(\text{QPROD}_t) = \beta_1 + \beta_2 \ln(P_t) + \beta_3 \ln(\text{PF}_t) + \beta_4 \text{Time}_t + \beta_5 \ln(\text{QPROD}_{t-1}) + e_t \tag{1}$$

where QPROD = aggregate production of young chickens, P = real price index of fresh chicken, PF = real price index of broiler feed, Time $= 1, 2, \ldots 52$. This supply equation is dynamic, with lagged production on the right-hand side. This predetermined variable is known at time t and is treated as exogenous. Time_t is included to capture technical progress in production. Some potential external instrumental variables are $\ln(Y_t)$ where Y is real per capita income; ln(PB) where PB is the real price of beef; POPGRO = percentage population growth from year $t = 1, 2, \ldots t$; $\ln(P_{t-1})$ = lagged log of real price of chicken; ln(EXPTS) = log of exports of chicken.

1. Estimate the supply equation for the years 1960-1999 by least squares. Discuss the estimation results. Are the signs and significance what you anticipated?

2. Estimate the supply equation for years 1960-1999 using an instrumental variables estimator with all available instruments. Compare these results to those in (1).

3. Test the endogeneity of $\ln(P_t)$ using the regression-based Hausman test.

4. Check whether the instruments are adequate, using the test for weak instruments. What do you conclude?

5. Do you suspect the validity of any instruments on logical grounds? If so, which ones, and why? Check the instrument validity using the test procedure discussed in class.