ECON 8602: Problem Set #2
(due Thurs., 11/29)

Take the statistics on exit rates from Table 1b and on the the size distribution for each age group from Table 1d of Dunne, Roberts, and Samuelson (QJE, 1989). (Ignore industry or cohort differences that, according to their later regressions, do seem to matter. In other words, treat the statistics as if they were calculated for plants in a single industry born in the same year.) The objective is to find out if Jovanovic's (1982) model can account for these statistics. If so, try to pin down the values of some of the parameters in the model. If not, propose a modification of the model that would help.

To keep things simple, you should assume that the industry equilibrium yields a constant price. In the end, you can verify whether the conditions for such an equilibrium are satisfied. Also, for simplicity, treat output and employment as syonymous and treat one period in the model as 5 years.

1. Plot the size distribution for each age grouping (3 plots lined up on one page for easy comparison).

2. Ignoring exit, describe precisely the model's implications for the joint process of plant age and plant size.

3. Choose reasonable yet parsimonious functional forms that allow you to simulate paths for the joint process of plant age and size given a vector of parameters (again, ignoring exit). Still ignoring exit, find parameters that match your plots of the size distribution.

4. Introduce the exit decision in the simplest way, i.e.$\gamma(n) = \gamma$. Find parameters that fit the exit statistics conditional on age and size.

5. What does the model implay about the $\gamma(n)$ function? What is the intuition. Is there information in the data to allow you to estimate the shape of $\gamma(n)$?

6. Are there any modifications to the model that you would propose to make it work better quantitatively.