

ECON 8602: Problem Set #1

(due Mon., 11/15)

The following problems are related to the Aizcorbe and Kortum paper (now available on the course web page). Type up your answers.

1. I showed in class that the industry equilibrium maximized consumer plus producer surplus and I showed how the industry equilibrium condition related to the shutdown and investment conditions in the paper. Use that same strategy, augmented as necessary, to derive the shutdown condition and the investment condition for a monopolist.
2. The Lucas and Prescott analysis of an industry equilibrium is particularly powerful if one can write down the Bellman Equation for the problem of maximizing consumer plus producer surplus. Then one can apply results about solutions to the Bellman Equation in order to compute the solution to the industry equilibrium. That approach did not appear possible in the continuous-time formulation. Instead, translate the model into discrete time being careful to mention any new issues that arise in a discrete time version.
3. In the discrete-time formulation, derive the Bellman Equation for the problem of maximizing producer plus consumer surplus. You may want to make restrictions to limit the dimension of the state variable.