Problem Set #7

ECON 833, Prof. Jason DeBacker
Due Thursday, November 18, 10:05 a.m.

This problem set will have you specify an economic model that involves dynamic optimization (Note that Problem Set 8 will have you program a solution to this model).

The Task

Write down a dynamic economic model that is relevant to *a question of interest to you*. Please use a discrete time model. The model can have an infinite or finite horizon. Choice variables can be continuous or discrete. You should specify the choices over this time horizon of some economic agent (e.g., an individual, household, firm, or social planner).

Your model description should include a specification of the economic environment (elements of this are outlined below) and provide the Bellman equation that represents the dynamic optimization problem. You should clearly note the state variable(s) and control variable(s). Finally, please show the first order necessary condition(s) of the model that characterize the model solution (or, if this is a discrete choice problem, show the cut-off rule(s) that characterize the model solution).

Specification of the environment (underlying stuff of the economy):

1. Population of agents
    - Who are we modeling? (e.g., individuals, households, firms)
2. Preferences
    - Utility function (if modeling individuals/households)
    - Profit function (if modeling firms)
    - Social welfare function (if modeling the social planner)
    - Rate of time preference
3. Productive technology
    - How do we produce output?
    - What's feasible?
4. Information technology
    - Who knows what?
    - When do they know it?
5. Enforcement technology
    - How are property rights enforced?
6. Matching technology
    - How do people meet?

Deliverables

Please print out a pdf compiled from TeX that includes the model description and necessary equations. Turn this in to me at by 10:05am on Thursday, November 18.