

MICROECONOMICS OF DEVELOPMENT  
*Assignment 1 – Due September 16, in class*  
*Production decisions under credit constraint*

I. Consider a two period household model. The household utility function  $U(c_1, c_2) = u(c_1) + u(c_2)$  is function of consumption  $c$  in each period. The household has an initial endowment of liquid asset  $y_1$ , and land holdings  $A$ . Suppose there is no land market, but that labor and product markets work smoothly. The household can combine land and labor during period 1 to produce an output available in period 2. The production function  $q(A, L)$  exhibits constant return to scale.

(a) Suppose that credit markets work. Write the household optimization problem. Derive the first order conditions. Show that yield is independent of landholdings and liquid asset. (You should solve for a generic unspecified utility function and CRS production function. If you cannot, then use a Cobb-Douglas for the production and possibly a specific utility function)

(b) Suppose now that households cannot borrow more than an amount  $\bar{B}$ . Write the optimization problem. Write the (Kuhn-Tucker) first-order conditions. Show that yield may now depend on landholdings and liquid assets.

(c) What other behaviors are affected by the credit market imperfection?

II. Discuss conditions of the credit market that could lead to a situation of borrowing constraint? You do not need to write a formal model, but the reasoning need to be sufficiently complete to be compelling. [Make sure that your discussion is tightly focused on conditions that lead to a borrowing constraint, i.e., no access or access to a limited amount of credit at the current interest rate].

III. Following on question I, propose an empirical analysis that would detect the existence of a credit constraint in production decisions. Be as specific as possible on the estimation strategy. How could one distinguish between the predictions of the model without binding credit constraints and the model in which these constraints are binding? Describe the context/strategy for the data you could use. Give precise equations to be estimated, precise tests of difference, precise graphs, etc. Discuss potential pitfalls and possible confounding factors, as one tries to explain real world data using stylized models.

[Avoid two common pitfalls: (i) proposing a randomized experiment that is completely unfeasible, such as giving credit to a randomized group of people (not acceptable by any bank), or forcing a constraint on a randomized group of people (unless you can find a context under which it is ethically acceptable). Randomized experiments are fine only if you can put them in a feasible framework. (ii) proposing to regress a given behavioral variable on credit amount, landholdings, income, etc., acknowledging that there are endogeneity and omitted variable bias problems, and leaving it there.]