Economics 8103
Microeconomic Theory
Spring 1999

Lecture 15
Screening

I. Introduction

A. In addition to signalling, another response to problems created by adverse selection is for the uninformed party to offer contracts that differ in attractiveness according to the type of the informed party.

B. We will study a labor market example in which the more productive worker has lower disutility of effort.

1. From the point of view of policy, this model is important as a potential justification for laws that, for instance, mandate a 40 hour work week by requiring 50% higher wages for “overtime.”

C. Another important application (which was the topic of the original paper by Rothschild and Stiglitz) is insurance.

1. For example, health insurers may have an incentive to offer a package combining lower premiums with less generous benefits in the hope that this will be more attractive to people who are less likely to get sick.

II. Screening in Employment

A. As before, the set of possible worker types is \( \Theta = \{ \theta_L, \theta_H \} \), where \( 0 < \theta_L < \theta_H \).

1. The probability that a worker has type \( \theta_H \) (or the fraction of the population with type \( \theta_H \)) is \( \lambda \).

2. The types are identified with the worker’s marginal product.
B. An employment contract consists of a wage \( w \) and a level of task difficulty \( t \in [0, \infty) \).

1. For simplicity, and to demonstrate that the screening effect does not depend on the more difficult task being more productive, we assume that task difficulty results only in disutility for both types of worker, and has no effect on productivity.

2. Let \( c_L(t) \) and \( c_H(t) \) be the monetary values of task difficulty \( t \) for the two types. We assume that:
   a. \( c_L(0) = c_H(0) = 0. \)
   b. \( c'_L(t) > c'_H(t) > 0 \) for all \( e \).
   c. As they did with the signalling model, MWG assume that
      \[
      c''_L(t), c''_H(t) > 0
      \]
      for all \( e \), and again the model is invariant under monotonic rescalings of the task difficulty variable, so (at least as far as I can tell) it is enough to assume that \( c_L(t), c_H(t) \to \infty \) as \( t \to \infty \).

3. The payoffs to the two types of worker resulting from task difficulty \( t \) and wage \( w \) are
   \[
   w - c_L(t) \quad \text{and} \quad w - c_H(t).
   \]

C. The game is as follows:

1. Three firms each offer a menu of difficulty-wage pairs.

2. Each worker chooses one of the contracts.
   a. We assume that workers’ reservation wages are zero.

III. Types of Equilibria.

A. There are no pooling or semi-separating equilibria, because if a contract is acceptable to both types of worker and does not make negative profits, one can make positive profits by offering a new contract that combines a slightly higher wage
with a slightly more difficult task, and is more attractive to high ability workers and less attractive to low ability workers.

B. The only possible separating equilibrium consists of the contracts \((0, \theta_L)\) and \((t^*, \theta_H)\) where \(t^*\) is the task difficulty that makes the low ability worker just indifferent between these two contracts.

C. Even this will not be an equilibrium if the high ability worker prefers \((0, \bar{\theta})\) to \((t^*, \theta_H)\), where \(\bar{\theta} := (1 - \lambda)\theta_L + \lambda\theta_H\) is the average productivity.

D. If a firm can enter while simultaneously offering two contracts, there may be other ways to destabilize the possible separating equilibrium.