Human Capital: Second Lecture

LABOR ECONOMICS (ECON 385)

BEN VAN KAMMEN, PHD

Introduction

The next question is *why* people with more schooling earn higher wages. So far one explanation, human capital accumulation, has been explored. To support the human capital theory of schooling, individuals would have to learn something in school that makes them more productive.

A competing theory for schooling is related to signaling. According to this theory, ability is the main source of productivity differences, and schooling only acts as a signal sent by workers to indicate that they are able to complete difficult tasks and are productive.

Signaling model of schooling

- A signaling model of schooling is built around the following (strong) assumptions.
  - Initial ability determines productivity, and schooling does not increase productivity. This is probably a poor assumption if you're looking at choices about childhood education (where ability is still in the formative stage), but not as bad for choices about college (where ability can realistically be considered fixed as a result of childhood experiences and genetics).
  - In a simple model, consider two "types" of workers—low productivity and high productivity. The present discounted values of each type's lifetime productivity can be specified as:

$$R_L \text{ and } R_H \text{ such that } R_L < R_H.$$

Pooling equilibrium

If there is no signal the employer can observe to learn about applicants' types, they will have to base wage offers on the probabilistic productivity, i.e., the expected productivity. This expectation is unconditional in the sense that it is based only on knowledge of the distribution of types given by q.

$$wage\ (all\ applicants) = E(R) = R_L * q + R_H * (1 - q)$$

Note that the expected wage is less than a high type is "worth" and more than a low type is "worth" in terms of lifetime productivity.

$$R_L < E(R) < R_H$$

- It is conceivable that after one period on the job, employers could learn about the employee's type, and renegotiate contracts based on that signal of productivity. This solution to this type of model is a little more difficult than the one in which signaling occurs prior to getting hired.

Pooling equilibrium unsatisfactory

High ability types should be willing to pay up to and including $[R_H - E(R)]$ to send a signal of their type to employers, since this is how much wages they are losing in the pre-signal equilibrium above. Suppose there is a signal, *S*, that high ability workers can send by going to college; it benefits high types to send the signal if the benefits outweigh the costs.

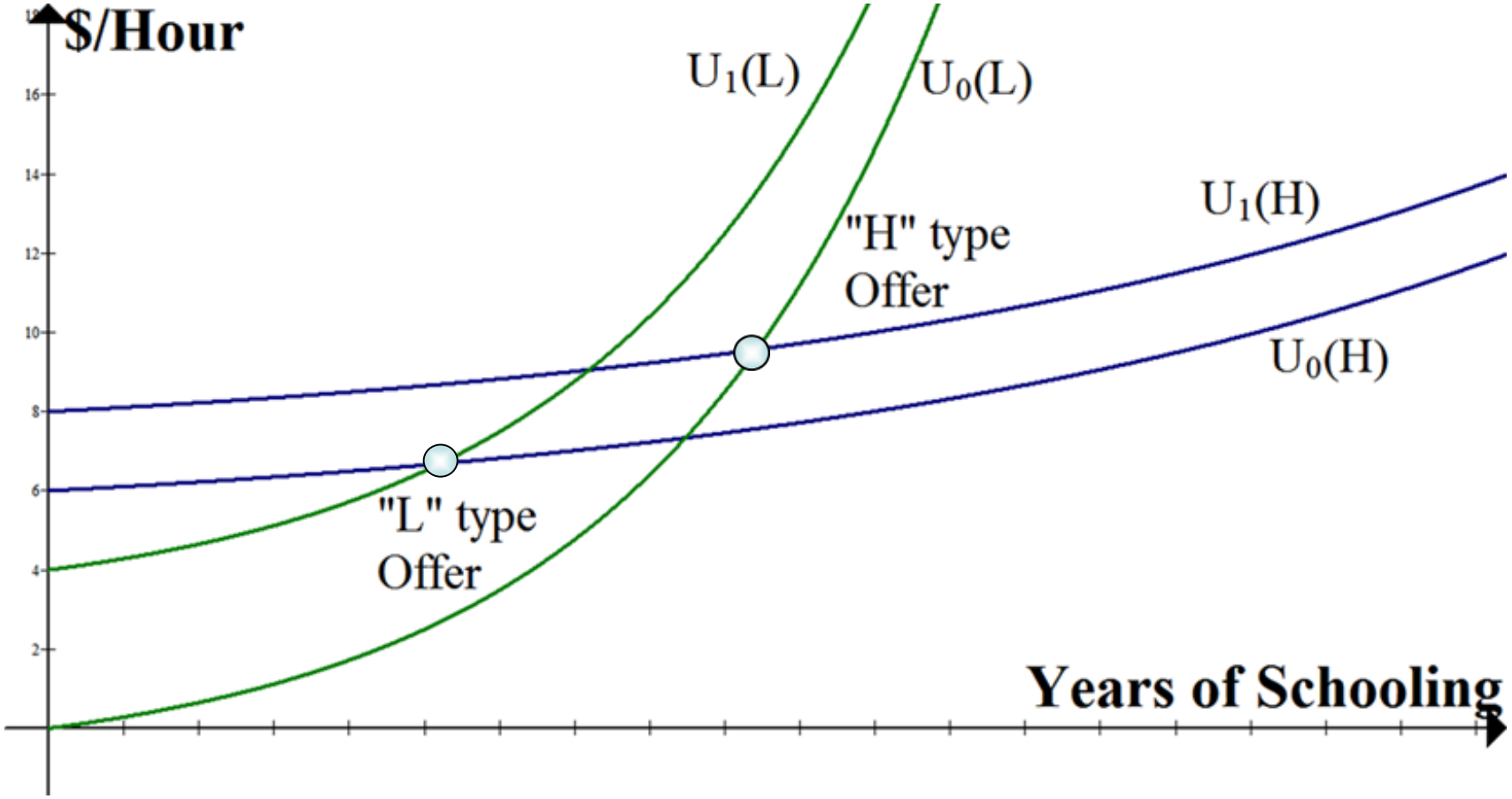
$$\text{High goes to college if } [R_H - E(R)] \geq C_H \text{ and Low doesn't if } R_L > E(R) - C_L$$

If this holds, all high types will go to college, signal that they are high productivity, and receive R_H. Even net of "tuition costs" this will leave them with higher wages than *E(R)*. Low types will find the cost of signaling too high, not obtain degrees, and receive R_L.

Separating equilibrium

- In this model the signal (college) completely reveals the state of the individual's productivity—all high types go to college and all low types do not. This is because there are only two types and no idiosyncrasy among individuals of the same type. It is not difficult to generalize this to a case with individual-specific preferences and productivities. Instead of two contracts, as in this solution, the solution to the general model would be a wage offer function, w(S), that leads the employer to offer a different wage to each different signal ("transcript") he observes.
- A graphical depiction of the separating equilibrium may look like the following slide.

Separating equilibrium (continued)



Implications of schooling as a signal

Education does not alter the stock of human capital. But it still has a value to the "H" type workers in terms of added earnings. Private return to schooling is likely to be positive even if a social returns (increase in national income) are zero.

- Education is still valuable for allocating "H" workers to their highest value tasks.

Again there is a sizeable literature on disentangling the effects of human capital and signaling in the education returns. Note that both theories predict higher ability individuals will obtain more education. No consensus exists about how the effect of schooling on wages is properly decomposed into signaling and human capital effects.