#2. Spence: Job-market signalling

Story: even if university ed'n has no effect on labour market productivity, the ed'n may have value to employer (and, hence, result in higher wage) because having a degree "signals" that one has an (otherwise costly to observe) ability which is correlated with productivity.

Model (Campbell, 7.2-7.5)

Two types of workers: {H, L}

- differ by cost of acquiring education

- worker of type = H, L

$$U_i(x,y)=B_i(x)+y \qquad x=\Omega-c_i(e)$$

e = years of education completed
$c_i(e)$ = foregone leisure; c( ) convex

Assumption 1: $c_H(e)<c_L(e) \quad \forall e$

ex: $c_L(e)=0.75e^2, \quad c_H(e)=0.5e^2$

Income: comp've market

- reflects *expected* productivity
- full information: w=value of MP

Assumption 2: MP depends on ability: $m_H > m_L$

(note: MP not affected by e)

A. Benchmark: Full information (1st best)

Firm: observes ability of potential employee

- offers m_H if type H, m_L if type L

Worker: chooses e = 0 (why?)

$$U_H(x,y) = B_H(\Omega) + m_H$$

$$U_L(x,y) = B_L(\Omega) + m_L$$

B: Asymmetric Information

- worker knows own ability
- costly for prospective employer to observe ability

Firm's wage offers?

- offer wage on basis of self-declared type?
- every worker has incentive to claim "H"

Can H-types credibly distinguish themselves from L-types?

- need investment L types won't make
- criteria:
  - sunk / irreversible
  - cheap enough that H prefers it to not (PC)

- costly enough that L chooses not (ICC)

Simple example:

- distribution of types: 50/50
- firm offers E(wage) if no investment:

$$y = \frac{m_H + m_L}{2}$$

- undergrad degree costs c_H or $c_L > c_H$
- utility: $u_i = y + x = w(e) + \Omega - c_i(e)$

(if c(e) convex, then utility concave in x)

What are payoffs to firm and workers here?

a) No one invests, so e = 0 for both H and L

$$w = \frac{m_H + m_L}{2}$$

$$u_H(e=0)=u_L(e=0)=0.5(m_H+m_L)$$

b) H-types invest in $e=\hat{e}$, L types don't

Firm: pays m_H if sees worker has $e=\hat{e}$

If worker has $e\neq\hat{e}$, pays m_H

Workers: H: $u_H(e=\hat{e})=m_H-c_H(\hat{e})$

L: $u_L(e\neq\hat{e})=m_L-c_L(e)$

L chooses e = ?

Conditions for this to occur?

ICC for L-types: $m_L \geq m_H - c_L(\hat{e})$

ICC for H-types: $m_H - c_H(\hat{e}) \geq m_L$

When satisfied?

Depends on productivity differences, cost of education, level chosen

Possible equilibria?

1. *Pooling equilibrium*

   - all workers choose same level of ed'n

     therefore all paid the same

   - no "signalling" in eq'm (no information)

   - level of education in eq'm?

     - could be zero, or strictly positive
     - depends on rules for employers follow

2. *Separating equilibrium*

   - education as signal: wkrs of different types

     choose different "e"

   - wkrs paid value of MP

   - information revealed in eq'm

- level of e chosen by each?