The signalling model

Higher education has no effect on productivity but signals which workers are productive

Information problem

1. Firms can’t directly determine who are high and low productivity workers
2. Firms observe education levels
3. The cost of getting an education is inversely related to productivity

Consider two types of workers S and D
S workers have high productivity
D workers have low productivity
\( P_S > P_D \)
The cost of acquiring the degree is \( C_S \) and \( C_D \)
\( C_D > C_S \)
The firm offers a wage \( W_E \) and \( W_N \)
\( W_E \geq W_N \)

A Separating equilibrium – one group invests, one does not

If \( (W_E - C_{ES}) > (W_N - C_{NS}) \) the S group will invest
If \( (W_N - C_{ND}) > (W_E - C_{ED}) \) the D group will not invest
Pooling equilibria

If \((W_E - C_{ES}) < (W_N - C_{NS})\) neither group invests
If \((W_N - C_{ND}) < (W_N - C_{ED})\) both groups invest

A part-separating, part-pooling equilibrium

Suppose there are 3 groups S, M, D
\[P_S > P_M > P_D\]
The costs of investing are \(C_S, C_M, C_D\)
\[C_D > C_M > C_S\]

Suppose \((W_E - C_{EM}) > (W_N - C_{NM})\) and
\((W_N - C_{ND}) > (W_E - C_{ED})\)
M & S types invest, D types do not

Suppose \((W_E - C_{ES}) > (W_N - C_{NS})\) and
\((W_N - C_{NM}) > (W_E - C_{EM})\)
S types invest, M and D types do not

Diagrams

Implication: In a separating or part-separating equilibrium there will be a positive correlation between education and earnings
What is the social return to education?

1) Human capital model – social returns at least equal to the private returns

2) Signalling model – no productivity effect, only an improvement of matches between workers and firms

Effect of government policy reducing cost of education

1) Human capital – increased productivity case for wealth-contingent fees

2) Signalling – reducing the cost leads to pooling equilibria and destroys the value of the signal
Estimating the returns to education

Earnings regression – Jacob Mincer, reduced form equation

Log (real wage) = f (age, age², years of education, years of education², degrees attained, gender, race, marital status, # of dependent children, region, industry)

Estimated relationship – increased earnings over the life-cycle associated with education

Distinct increase associated with earning a degree

Interpretations

1) productivity effect – years coefficient reflects productivity
2) omitted variable effect – years is correlated to inherent productivity which is omitted, coefficient on years is biased upwards