



JOB MARKET¹ SIGNALING

M.SPENCE (1973)

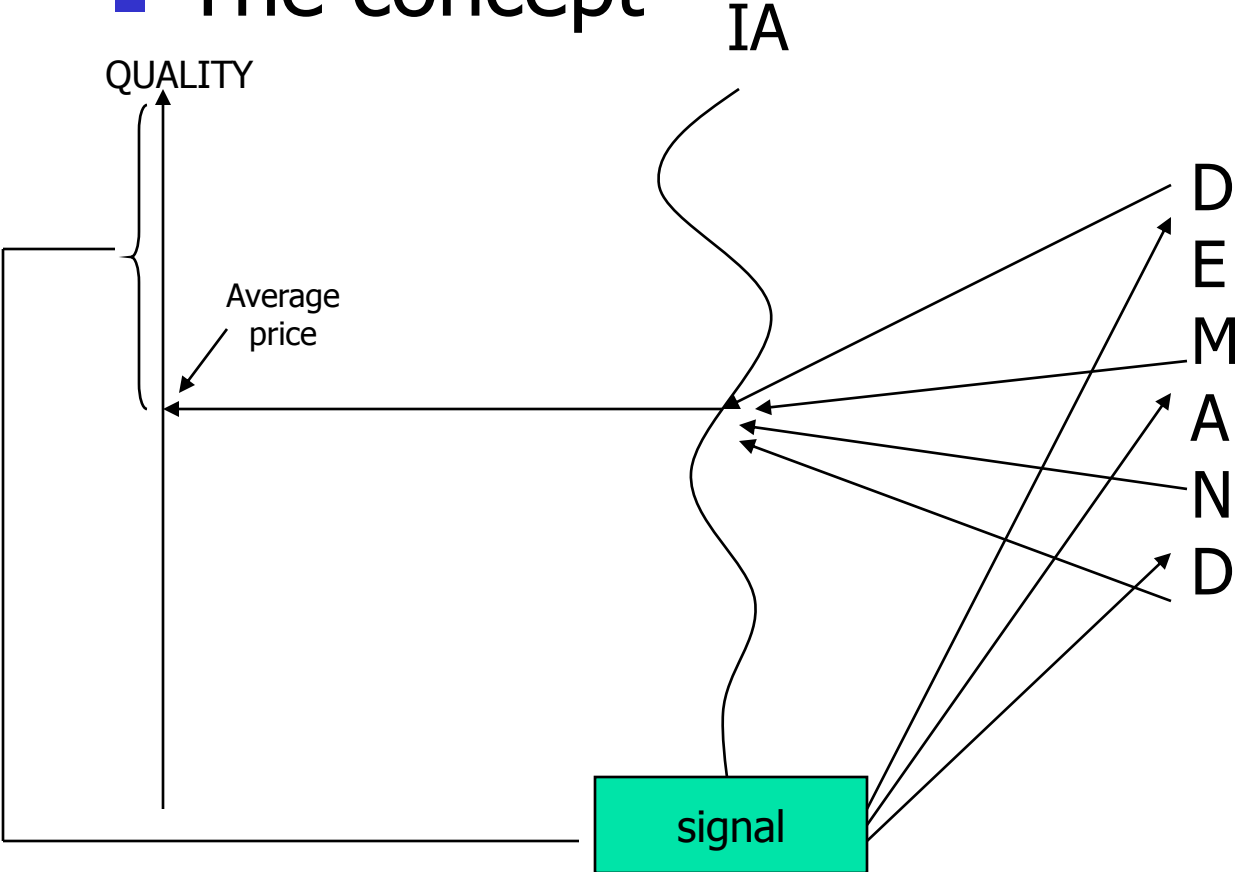


PLAN

- About signals
- Job market signaling

ABOUT SIGNALS

- The concept





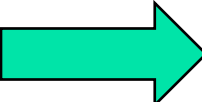
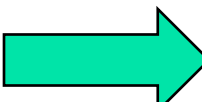
ABOUT SIGNALS

- Definition

- A signal is a financial decision which conveys information
- This decision is not a first-best one
- The gap between the 1st-best under perfect information and the 2nd-best under information asymmetry is the signaling cost
- The cost signals firm quality



ABOUT SIGNALS

- Spence condition
 - Second best  cost
 - Cost  quality
- Spence condition for a signaling equilibrium requires that the marginal cost of signaling is decreasing with firm-quality



ABOUT SIGNALS

- Examples of signals
 - Debt (Ross, 1976)
 - Dividends (Bhattacharya, 1977)
 - Retained equity (Leland and Pyle, 1977)



JOB MARKET SIGNALING

- The job market
 - 2 distinct groups
 - Productivity=1 for group 1
 - Productivity=2 for group 2
 - Information asymmetry concerns productivity
 - 1 employer
 - A potential signal=education available at a cost
 - Cost of education level $y=y$ for group1
 - Cost of education level $y=y/2$ for group2



JOB MARKET SIGNALING

group	Marginal product.	Proportion of population	Cost of education level y
1	1	q_1	y
2	2	$1-q_1$	$y/2$



JOB MARKET SIGNALING

- « A signaling equilibrium can be thought of as a set of employers beliefs that generate offered wage schedules, applicant signaling decisions, hiring, and ultimately new market data over time that are consistent with the initial beliefs » (Spence, p360)

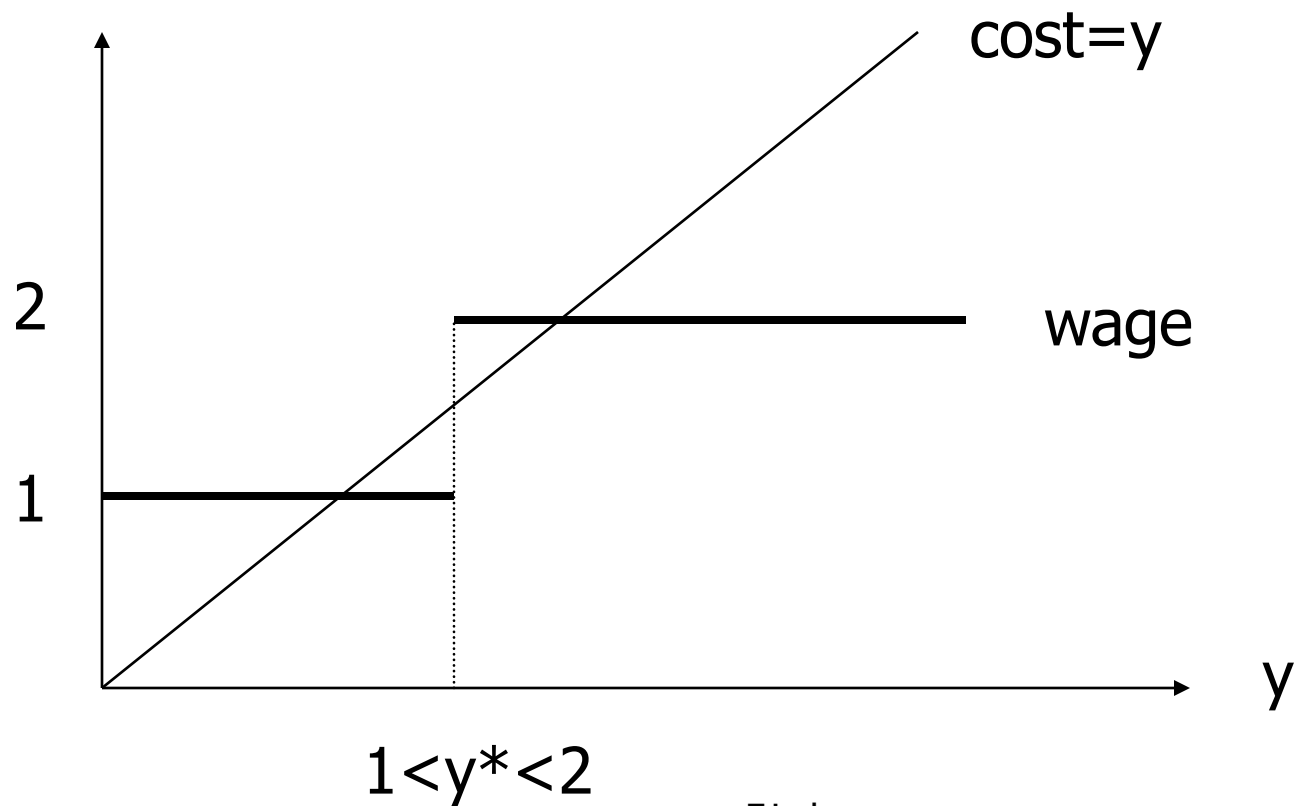


JOB MARKET SIGNALING

- Suppose that the employer believes that there is some level of education y^* such that:
 - If $y < y^*$, productivity=1
 - If $y > y^*$, productivity=2
- The offered wage schedule is:
 - $W(y)=1$ if $y < y^*$
 - $W(y)=2$ if $y > y^*$
- Given the offered wage schedule, what are the optimal levels of education for the 2 groups?

JOB MARKET SIGNALING

- For group 1



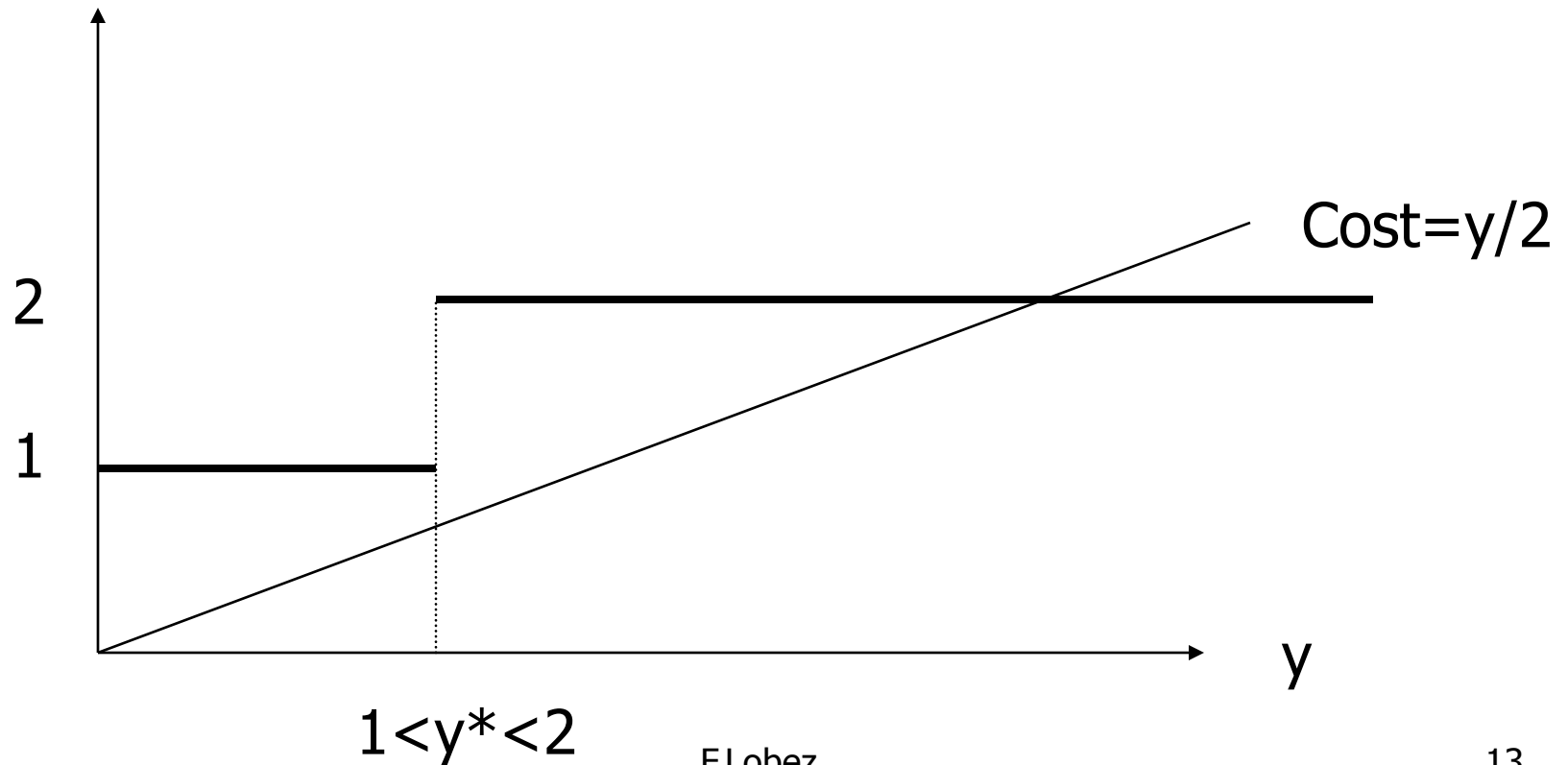


JOB MARKET SIGNALING

- Members of group 1 must set $y=0$ to maximize the difference {wage-cost}
 - $y=0$ implies a benefit of 1
 - $y>0$ implies
 - Either a benefit of $1-y$ if $y<y^*$
 - Or a benefit of $2-y$ if $y>y^*$

JOB MARKET SIGNALING

- For group 2





JOB MARKET SIGNALING

- Members of group 2 must set $y=y^*$ to maximize the difference {wage-cost}
 - $y=y^*$ implies a benefit of $2-(y^*/2)$
 - $y>y^*$ implies no marginal benefit, but a greater cost of education
 - $y<y^*$ implies a benefit of $1-(y^*/2)$ which is maximized when $y=0$, with a net profit of 1!
- So in this case, the employers beliefs are confirmed and we have a signaling equilibrium



JOB MARKET SIGNALING

- Conditions for a signaling equilibrium
 - Group 1 sets $y=0$ if
 - $1-0 > 2-y^*$
 - Group 2 sets $y=y^*$ if
 - $2-(y^*/2) > 1-0$
 - Both conditions are satisfied provided that
 - $1 < y^* < 2$
- So, there is an infinite number of possible equilibrium values for y^* !
 - But these equilibria are not equivalent from the point of view of welfare
 - Increases in y^* hurt group 2 while group 1 are unaffected
 - So best equilibrium is obtained with $y^*=1+\mu$ (μ small)



JOB MARKET SIGNALING

- Signaling equilibrium vs pooling equilibrium
 - If no signaling takes place, each person is paid his expected marginal product= $q_1 + 2(1 - q_1) = 2 - q_1$
 - Group 2 prefers to signal if:
 - $2 - (y^*/2) > 2 - q_1$
 - $q_1 > y^*/2$
 - If $y^* = 1 +$, then $q_1 > 1/2$
 - When the proportion of group 1 is too high, there is an incentive for group 2 to signal themselves, because the pooling equilibrium wage is too low!



JOB MARKET SIGNALING

- Extensions
 - There are other equilibria
 - Suppose that the employer's beliefs are the following:
 - If $y < y^*$, group 1 wp q_1 and group 2 wp $(1 - q_1)$
 - If $y > y^*$, group 2 wp 1
 - This is a semi-separating equilibrium
 - A necessary condition for a signaling equilibrium to hold is that the educational cost must be negatively related to productivity (Spence condition = the marginal cost of signaling must be decreasing with quality)



JOB MARKET SIGNALING

- Extensions

- Suppose that there are men and women in the job market
- Suppose that the employer's beliefs are the same that in the separating equilibrium
- No logical conditions require that $y^*_w = y^*_m$ in equilibrium!
- So, there is the possibility that men and women will settle into different stable signaling equilibria in the market!



JOB MARKET SIGNALING

- Conclusions
 - Remember the importance of the Spence condition!
 - How to choose a signal?
 - In fact, many signals respect the Spence condition!
 - Do signaling equilibria exist in general?
 - Is it possible to have multi-signals equilibria?