Lecture 7. The Signaling Model of Education

1. Education as a screening device

The Spence Model:

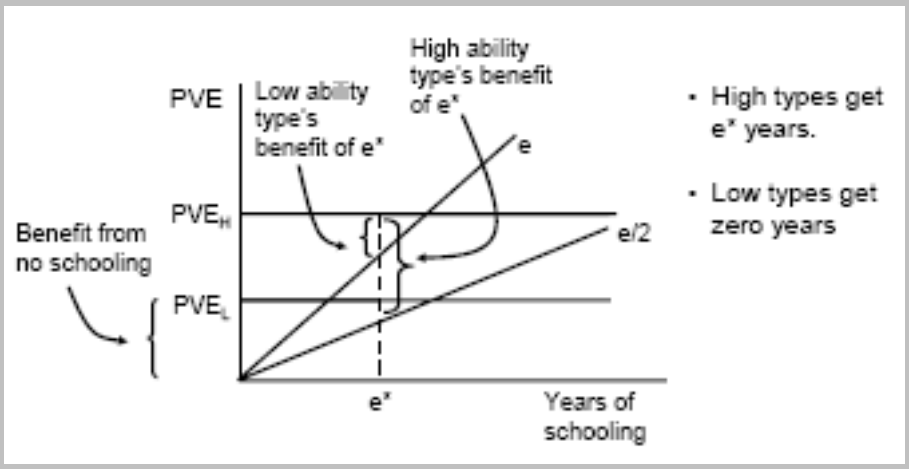
Main assumptions:

a. Two types of workers
   – High ability types: H
   – Low ability types: L
b. Worker types are unobservable or costly to observe to employers.
c. Education is less costly for high types

Types	Productivity	Population Share	Cost of Education
L	1	q	e
H	2	1−q	e/2

Let PVE denote the present discounted value of a worker's earnings. In a perfectly competitive market, equals the present discounted value of a worker's marginal product. So $2=PVE_H=2 \times 1 = 2PVE_L$

Now let's further assume that employers pay workers PVE_H if they acquire e* or more years of education, and PVE_L if they acquire less than e* years of education:



2. Empirical implications of the signaling model

Comparison of two models' implications

	Human capital	Signaling
People who attend additional years of schooling are more productive	Yes	Yes
People who attend additional years of schooling receive higher wages	Yes	Yes
People will attend school while they are young	Yes	Yes
Education increases people's productivity	Yes	Not necessarily

Because the empirical implications of the Human Capital and Signaling models appeared so similar, many economists concluded that these models could never be empirically distinguished.

3. Signaling or human capital: does it really matter?

It doesn't matter so much for individual investment decisions as long as education is truly associated with higher pay. But it does matter from a society's education policy point of view.

4. Empirical evidence on human capital vs. signaling model

The Tyler, Murnane and Willett study ("Estimating the Labor Market Signaling Value of the GED" in *Quarterly Journal of Economics*, 2000)

The Heywood and Wei study ("Education and the Signalling Hypothesis: Evidence from a Highly Competitive Labor Market", *Education Economics*, 12(1):1-16, April 2004.)

Table 4. Sample selected earnings regressions by gender

	Males			Females		
	Employed	Self-employed	Difference	Employed	Self-employed	Difference
Form6 (completed)	0.6359* (29.36)	0.5090* (6.047)	0.1269* (3.711)	0.6522* (24.91)	0.5874* (4.069)	0.0649 (0.709)
Tech	0.7026* (27.53)	0.5992* (5.639)	0.1034 (1.372)	0.7366* (22.23)	0.3347 (1.374)	0.4019* (2.622)
HTech	1.071* (37.21)	0.8162* (6.102)	0.2550* (2.710)	1.110* (30.33)	0.6660* (2.572)	0.4401* (2.685)
Diploma1	0.6397* (15.89)	0.4998* (4.338)	0.1399 (1.675)	0.6286* (12.29)	0.4951* (2.105)	0.1334 (0.887)
Diploma2	0.8754* (23.02)	0.6161* (5.094)	0.2592* (2.970)	0.9300* (20.62)	0.4766 (1.831)	0.4534* (2.751)
Teacher	0.5400* (1.734)			0.7088* (3.458)		
Teacher (completed)	0.9778* (19.82)	0.8884* (2.764)	0.0893 (0.400)	1.299* (34.71)	0.3415 (0.962)	0.9582* (4.313)
HKDegree	0.9424* (7.921)	0.7018* (2.667)	0.2406 (1.117)	0.4960* (3.016)	0.9068 (0.776)	−0.4108 (0.830)
HKDegree (completed)	1.277* (51.58)	0.9992* (11.69)	0.2780* (4.550)	1.456* (43.25)	0.9516* (4.493)	0.5031* (3.759)
ForeignDegree	0.4821* (6.756)	0.3439 (1.719)	0.1381 (0.950)	0.3071* (4.163)	1.032* (2.263)	−0.7251* (2.501)
ForeignDegree (completed)	1.121* (48.21)	0.8472* (13.36)	0.2740* (5.941)	0.7479* (24.51)	0.6913* (5.087)	0.0566 (0.651)
GradDegree	1.458* (2.097)			1.263* (3.230)		
GradDegree (completed)	1.709* (41.89)	1.188* (6.207)	0.5211* (3.883)	1.535* (20.99)	1.192* (2.960)	0.3428 (1.346)
Lambda	1.184* (33.73)	0.3086* (11.75)	0.8749* (16.54)	1.607* (20.34)	0.1860* (2.954)	1.421 (4.709)
R-squared	0.4161	0.2079	0.3408	0.1799		
N	68541	4687	40743	1065		

Note: The specification includes dummy variables for 10 broad industries and all other controls presented in Table 3 but suppressed to save space. *t*-Statistics presented in parentheses. * Statistically significant at the 1% level.

Table 6. Sample selected earnings regressions by gender excluding professionals

	Males			Females		
	Employed	Self-employed	Difference	Employed	Self-employed	Difference
HKDegree	1.014*	0.8406*	0.1738	0.4724*	0.9346	–0.4622
	(8.532)	(2.665)	(0.644)	(2.769)	(1.205)	(0.938)
HKDegree	1.278*	0.8958*	0.3818*	1.455*	0.8787*	0.5765*
(completed)	(51.99)	(9.821)	(5.653)	(43.59)	(3.366)	(3.833)
ForeignDegree	0.4778*	0.3492	0.1386	0.2920*	1.041	–0.7498*
	(6.655)	(1.719)	(0.956)	(3.859)	(2.286)	(2.599)
ForeignDegree	1.136*	0.8593*	0.2762*	0.7528*	0.6714*	0.0814
(completed)	(48.87)	(12.86)	(5.653)	(24.56)	(4.532)	(0.866)
GradDegree	1.463*			1.270*		
	(2.146)			(3.313)		
GradDegree	1.715*	1.047*	0.6677*	1.591*	1.004*	0.5864*
(completed)	(42.52)	(6.207)	(4.595)	(21.87)	(2.195)	(2.042)
Lambda	1.152*	0.3086*	0.8749*	1.567*	0.1737*	1.393*
	(33.56)	(11.75)	(16.54)	(20.05)	(2.781)	(4.456)
R-squared	0.4084	0.1953	0.3348	0.1631		
N	63354	4613	40101	1039		

Note: The specification includes dummy variables for 10 broad industries and all other controls presented in Table 3 but suppressed to save space. *t*-Statistics presented in parentheses. * Statistically significant at the 1% level.