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Econ 309

Weeks 8-9: Education, Human Capital, and Signaling

- I. The Economics of Education: A Short History
 - A. Economists have intently studied education for about sixty years.
 - B. Standard view: education – especially formal schooling – is the main way society “invests in people.”
 - C. What happens when you invest in people? Just as transforming natural resources yields physical capital, transforming human resources yields “human capital.”
 1. Classic story: Schools take illiterate, innumerate children and transform them into literate, numerate adults – who then use their literacy and numeracy on the job.
 - D. The human capital view of education is one of economics’ most successful intellectual “exports.” It’s widely used not just by economists, but by:
 1. Other social scientists (education, sociology, psychology)
 2. Pundits
 3. Policy-makers
 4. General public
 - E. The human capital view is bipartisan. Liberals and Democrats are slightly more prone to hail education’s economic payoff. But liberals and conservatives, Democrats and Republicans – whether social scientists, pundits, policy-makers, or the general public – all see education’s economic benefits as immense.
- II. Human Capital Purism vs. Signaling
 - A. I strongly disagree with this consensus. My book, *The Case Against Education*, explains why.
 - B. Big problem: much – if not most – of the academic curriculum at least *seems* irrelevant for almost all jobs.
 1. History and social studies
 2. Music and art
 3. PE
 4. Higher mathematics
 5. Classic literature and foreign languages
 - C. Even more puzzling: Employers seem to *care* about performance in “irrelevant” classes – especially if poor performance prevents graduation.
 - D. These two observations inspire an alternative economic theory of education, known as “signaling.”
 - E. Basic idea of educational signaling: Academic success can *certify* worker quality without *increasing* it.
 - F. Signaling can make totally irrelevant education lucrative.

1. If people who do well in underwater basket-weaving are, on average, better workers than people who don't do well in this subject, profit-maximizing employers will be happy to pay a premium for such workers.
 2. Why? While learning UBW doesn't make you a better worker, it *convinces* employers that you were a better worker all along.
- G. Do any economists claim that signaling explains *all* of education's financial payoffs? No! Literacy and numeracy are obviously useful on most jobs.
- H. Do any economists deny that signaling explains *some* of education's financial payoff? Yes, especially by default. "Human capital purism" – the view that human capital explains 100% of education's payoff in the labor market – is the standard assumption in the large majority of empirical work and policy discussion.
1. Researchers often measure the effect of education on earnings, then *call* it the effect of education on *skill*.
- I. Preview: I claim that signaling accounts for at least 50% of education's payoff. My preferred point estimate: 80%.

III. Ability Bias

- A. Earnings rise sharply with education. Results for full-time, year-round workers:

Average Earnings By Educational Attainment (2011)

	Some High School	High School Graduate	Bachelor's Degree	Master's Degree
Average \$ Earnings	31,201	40,634	70,459	90,265
Premium Over H.S.	-23%	+0%	+73%	+122%

Source: United States Census Bureau 2012a.

- B. Statistically naïve observers leap to the conclusion that education is fantastically lucrative: Give up four years of your life in college, and your earnings rise by 73%!
- C. Economists, however, are trained to skeptically assess such claims. How much of the high observed correlation between education and earnings is *causal*?
- D. Why would the causal effect of education on earnings be smaller than it seems? Ability bias: Perhaps the well-educated have more pre-existing talent, family connections, greed, favorable location, etc.
1. Sports analogy.
- E. Theoretically naïve observers leap to the conclusion that if education has a large causal effect on earnings, the signaling model is false. But the signaling model specifically predicts a causal effect of education on earnings!
1. Signaling doubts education's effect on *skill*, *not earnings*!

- F. There are *three* competing economic theories of education: human capital, signaling, and ability bias. Each takes stances on three distinct issues:
1. Visibility of skill.
 2. Education's effect on skill.
 3. Education's effect on income.
- G. Summary table:

Table 3.2: Human Capital, Signaling, and Ability Bias

Story	Visibility of Skill	Education's Effect on Skill	Education's Effect on Income
Pure Human Capital	Perfect	WYSIWYG	WYSIWYG
Pure Signaling	Zero	Zero	WYSIWYG
Pure Ability Bias	Perfect	Zero	Zero
1/3 Human Capital, 1/3 Signaling, 1/3 Ability Bias	2/3	1/3*WYSIWYG	2/3*WYSIWYG
WYSIWYG="What You See Is What You Get."			

1. Note: Mixed versions of the three theories are not only possible, but much more plausible than any pure version.

IV. Correcting for Ability Bias

- A. Human capital and signaling are competing explanations for whatever effect education has on earnings. But you have to investigate ability bias before you can determine how much effect of education on earnings there is to apportion.
- B. Classic approach: measure ability, then compare people with different educations but identical ability. Statistically, this is equivalent to adding control variables to a regression of logged income on a constant and education.
- C. IQ (or "cognitive ability" more generally) is the most common control variable. Findings:
 1. Holding education constant, 1 IQ point (mean=100, SD=15) raises earnings about 1%.
 2. Holding IQ constant, the education premium falls 20-30%.
- D. Much thinner literature adds controls for "non-cognitive abilities" like conscientiousness and conformity. Relatively small marginal effects of adding these controls, but maybe the measures are poor?
- E. Verdict: Cautious estimate of 25% total ability bias (20% cognitive plus 5% non-cognitive); Reasonable estimate of 45% total ability bias (30% cognitive plus 15% non-cognitive).

V. Basics of Signaling

- A. There must be different types, varying by intelligence, conscientiousness, conformity, or whatever.
- B. Types must be non-obvious.
- C. Types must visibly differ *on average*. Though you can't see type directly, you can fallibly *infer* type.

- D. Two questions for employers to ask:
 1. Unanswerable question: "Who's truly the best worker for the job?"
 2. Answerable question: "Which worker sends the best signals?"
 - E. If employers hire based on the second question, they create an incentive for less desirable types to *impersonate* higher-quality types. To remain viable, signals must, on average, be more costly for types in higher demand.
 1. "Cost" can be financial or psychological.
 - F. Signaling is just a special case of statistical discrimination.
 - G. What does education signal?
 1. Intelligence
 2. Conscientiousness
 3. Conformity
 4. More?
 - H. In a sense, almost everyone conforms to something. What education signals is conformity to workplace norms.
 1. While school and work norms are different, they heavily overlap: obedience to authority, punctuality, tolerance for boredom, good manners, etc.
 - I. Recurring analogy: You can raise a gem's market price by skillfully cutting it (human capital) or favorably appraising it (signaling).
- VI. The Signs of Signaling
- A. Sign #1: The ubiquity of useless education.
 1. High school coursework
 2. College majors
 3. Tests of adult knowledge
 4. Very low Transfer of Learning
 - B. Sign #2: The handsome rewards of useless education
 1. Large payoff remains after correcting for ability bias.
 2. Wheat versus chaff: high school classes
 3. Wheat versus chaff: payoffs by college major
 4. Government licensing and credentialism
 - A. Sign #3: The sheepskin effect: Low payoffs per year of education, high payoffs for graduation.
 1. High school: +4.4% for normal year, +15.1% for graduation year.
 2. College: +5.1% for normal year, +34.1% for graduation year.
 - B. Sign #4: Credential inflation: educational needed to *get* jobs rises even when the educated needed to *do* jobs doesn't. Long-run estimates:
 1. Early 70s to mid-90s, average education rose 1.5 years; higher-skilled occupations account for only .3 years.
 2. 1972-2010, average education rose 1.75 years; higher-skilled occupations account for only 19%.

- C. Sign #5: Personal versus national education premium: Education pays individuals much more than it pays countries.
1. International results for personal education finds high premium (roughly 10% per year) in all countries.
 2. Results for national education are very mixed. Some prominent economists even find *negative* effects; others, low but positive effects. The rest find moderate positive effects.
 3. Bad Third World data? Problem also holds for OECD. Results for study that tries eight different education measures:

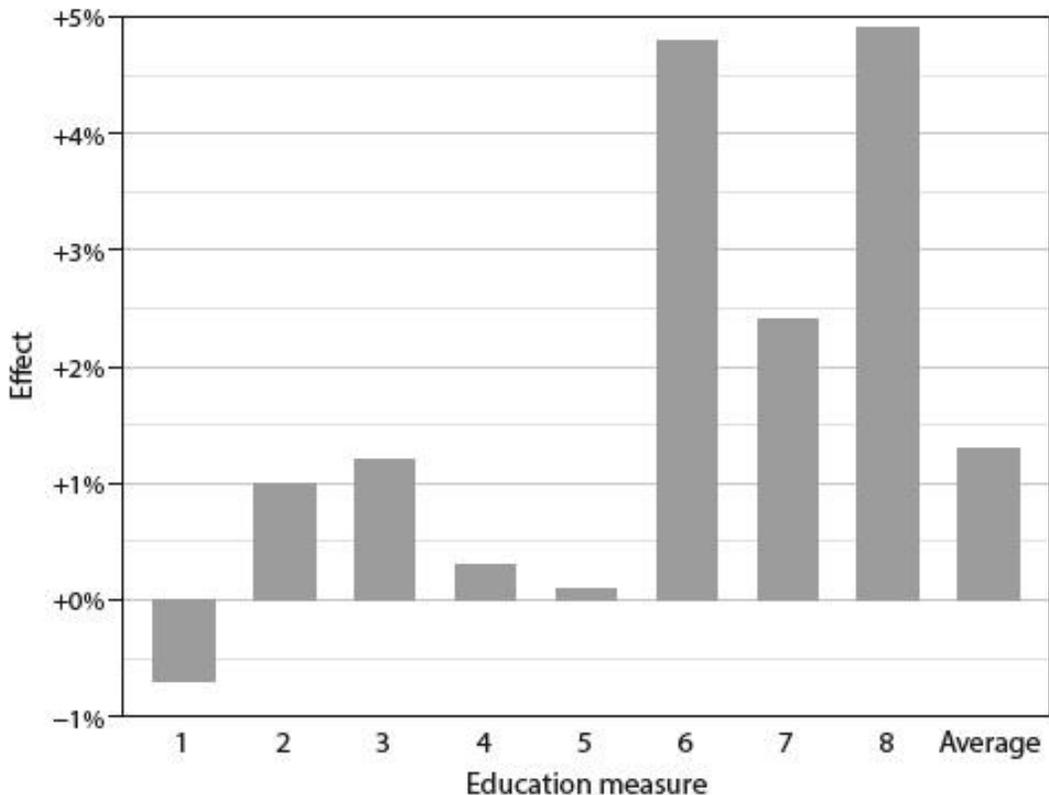


Figure 4.3: Effect of a Year of National Education on National Income

Source: de la Fuente and Doménech 2006b, appendix, p. 52, table A.1.f.

VII. Objections to Signaling

- A. Leading objections to the signaling model don't say it contradicts experience. They say experience is misleading. Leading objections:
 - B. "Signaling=100% signaling." Schools teach literacy and numeracy, both useful job skills, so the signaling model is wrong.
 1. Reply: No prominent advocate ever said this. Signaling purism is mythical, but human capital purism is real.

- C. “Signaling=signaling intelligence alone.” IQ tests are much cheaper ways to measure intelligence than years in school. Why don’t employers just use those?
1. Reply: Education signals more than intelligence - and high IQ scores without matching educational credentials signal low conscientiousness and conformity.
- D. “Signaling shouldn’t take years.” Once you’ve signaled your quality with a year or two in school, why would employers value anything further?
1. Reply: There are no “show-stopping” signals of worker excellence. Signaling is a war of attrition, where you can always go farther to look better. If your competitors have many years of education, you need comparable achievements to convince employers you’re in the running.
- E. “You can’t fool the market for long.” You might need a credential to get hired. But employers soon figure out your true quality, and pay you accordingly.
1. Reply: When researchers measure employer learning, it seems to take years or decades, not months. But even if employers could find and fire phonies in a few months, this can’t happen to workers they never hire. “Diamonds in the rough” still need lengthy educations to get their foot in the door.
 2. Further reply: The employer learning critique falsely assumes employers fire any worker who falls short of their expectations. In the real world, employers often retain disappointing workers because of hiring costs, legal costs, or pity. And both legal costs and pity argue for “dehiring” (helping unwanted employees find another job) rather than firing, further cementing signaling’s rewards.
- VIII. Puzzles for Human Capital Purism
- A. Many facts about education are hard to explain *without* signaling. Top puzzles:
- B. “The best education in the world is already free.” Colleges almost never check attendees’ IDs. So if you simply want to build your human capital, you can move near whatever school you believe to be the best, and receive a full education for zero tuition.
1. Would you rather have a Princeton diploma without a Princeton education, or a Princeton education without a Princeton diploma? If you pause to answer, you must think signaling is pretty important.
- C. “Failing versus forgetting.” Human capital theory says employers pay you for skills you have, not skills you used to have. But the career damage of failing classes is high, while the career damage of forgetting what you learned is usually minimal.

- D. “Easy A’s.” Why do students seek out professors known for their easy grading, instead of professors known for teaching lots of useful skills?
 - E. “You’re only cheating yourself.” In the human capital model, academic cheating is pointless. So is preventing cheating.
 - F. “Why do students rejoice when the teacher cancels class?” Well?
 - G. Signaling readily solves all their puzzles.
 1. Why not unofficially attend Princeton? Because employers won’t know you did so.
 2. Why is failing worse than forgetting? Because almost everyone forgets, so it doesn’t send a bad signal.
 3. Why do students favor easy graders? Because employers don’t know which professors are hard, so you get the same signal for less effort. (Easy *majors*, in contrast, are pretty obvious to employers).
 4. Cheating is a problem because it dilutes the value of everyone else’s signals.
 5. Students like cancellation because they get the same grade for less work.
- IX. The Selfish Versus the Social Returns of Education
- A. Both human capital and signaling models agree that education is individually rewarding. They disagree about *why*.
 1. Human capital: Education pays because it raises skill.
 2. Signaling: Education pays because it *reveals* skill.
 - B. So is this a purely academic dispute? No. The models disagree about education’s *social* rewards. What happens if *average* education rises?
 1. Human capital: Average skill rises, so society is richer.
 2. Signaling: Average skill stays the same, so society is no richer. (In fact, since education costs time and money, society is poorer).
 - C. Basic estimates of education’s selfish return:

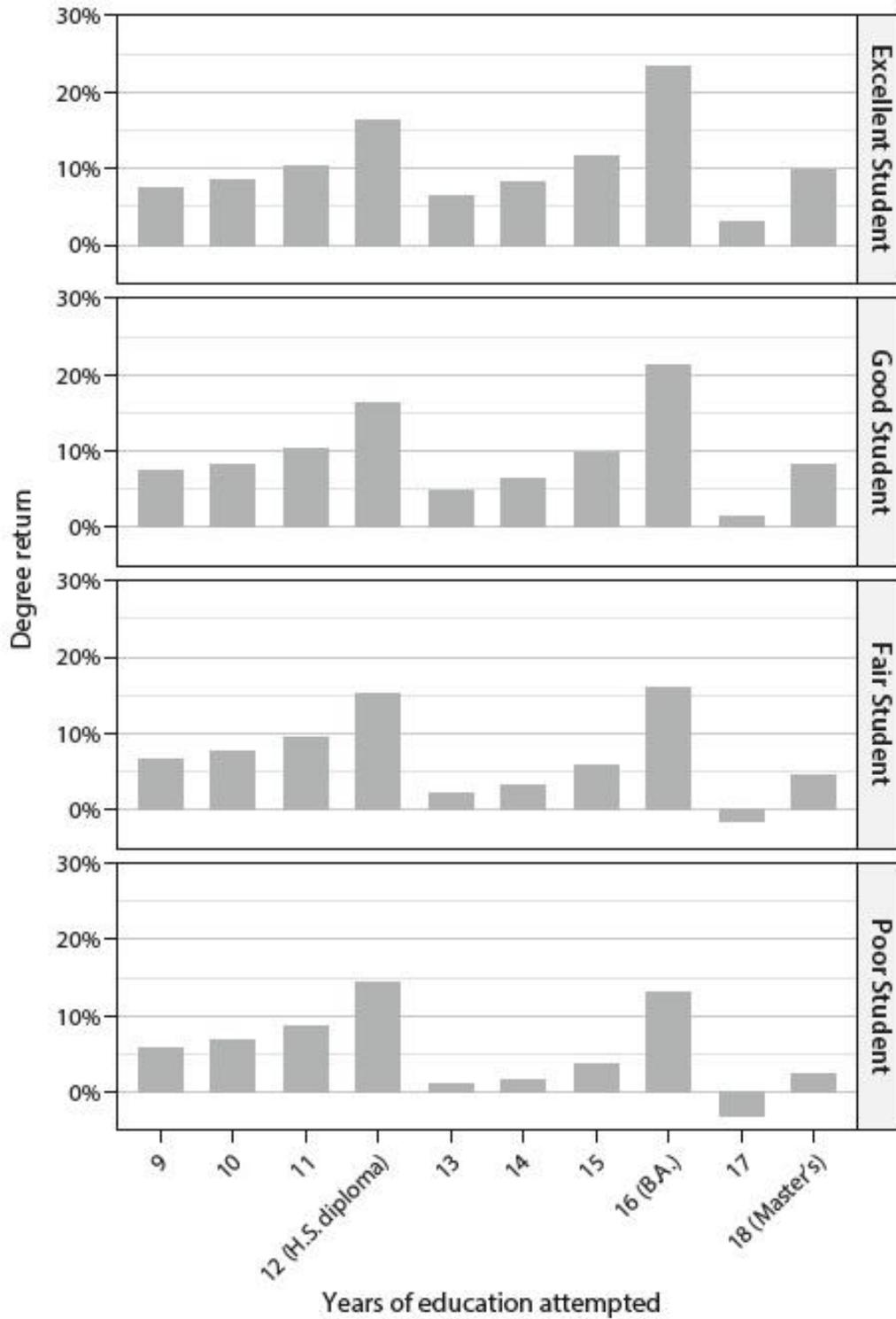
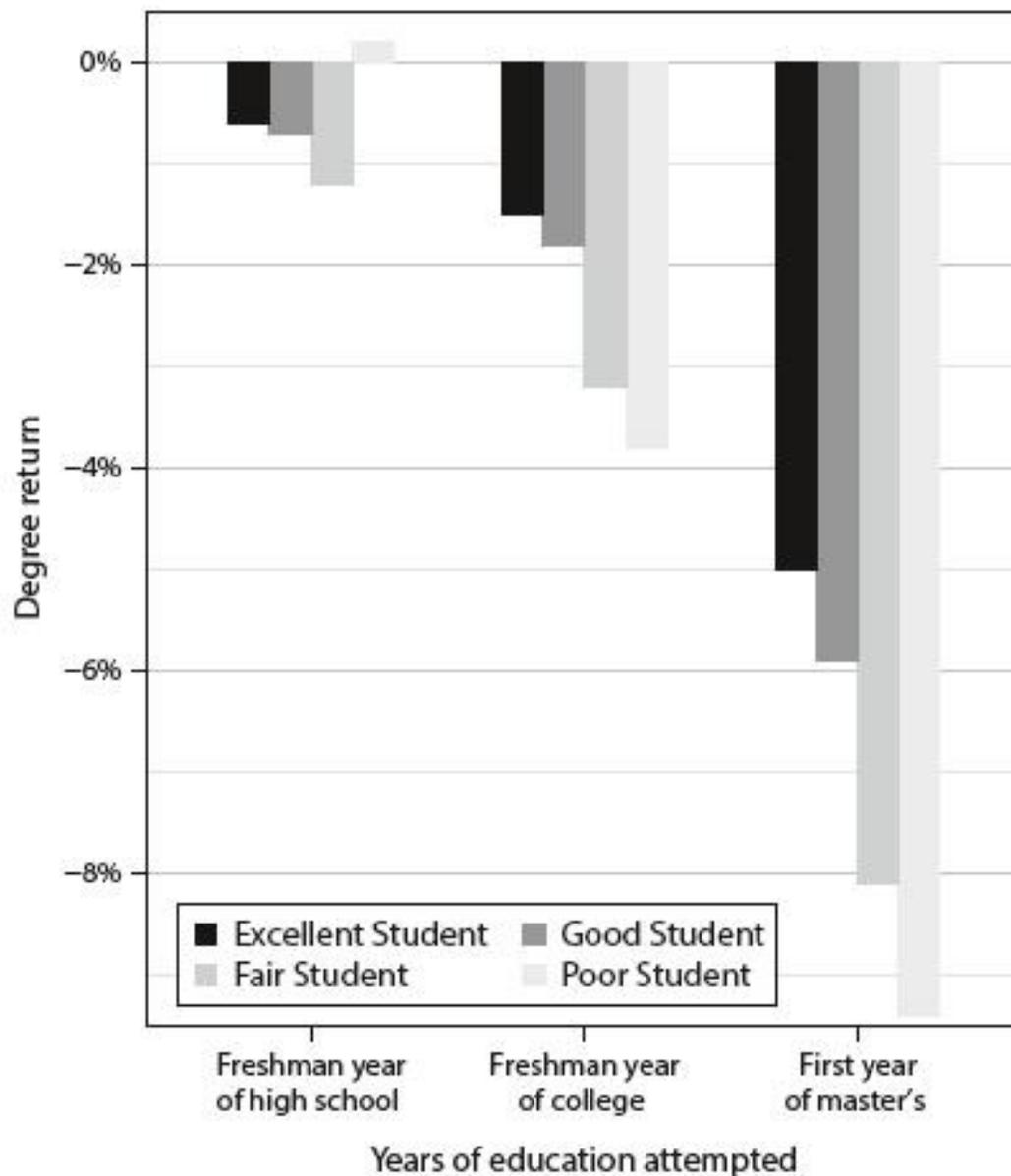


Figure 5.7: Selfish Degree Returns by Student Ability

Source: Figures 5.5 and 5.6 and text

D. Basics estimates of education's social return:



- X. CBA and the Case of Educational Austerity
- A. With signaling, rising education yields credential inflation. Workers need more education to get the same job.
 1. The Fallacy of Composition: Insofar as signaling is true, education is “smart for one, dumb for all.”
 - B. Social returns below the market interest rate clearly indicate that the quantity of education exceeds the level recommended by CBA.
 - C. Zero and negative social returns are a strong sign that the quantity of education *greatly* exceeds the level recommended by CBA.
 - D. *Can* education levels fall? Sure. If you think government funding raises education, simply cutting that funding will have the opposite effect. And current government funding is massive, so there’s plenty of room to cut.